RCMI COORDINATING CENTER

2023 Research Centers in Minority Institutions (RCMI) Consortium National Conference

Book of Abstracts

RCMI Coordinating Center (RCMI CC)
Bethesda, MD - April 12-14, 2023
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We extend our deepest appreciation for the hard work and dedication you demonstrated as members of the abstract review workgroup for the 2023 RCMI Consortium National Conference. Your contributions were instrumental in developing the next generation of health disparities research and extending the reach and visibility of RCMI scientists and communities interested in improving health outcomes.

Your exceptional expertise and diligent efforts in reviewing and selecting the abstracts will greatly contribute to the success of the 2023 RCMI Consortium National Conference. Thanks to your work, the event will feature engaging presentations and fruitful discussions that will provide attendees with new insights and perspectives on the latest developments in health disparities research.

We understand that serving as a reviewer requires a considerable investment of time, energy, and expertise. However, your dedication to the advancement of scientific knowledge is an inspiration to us all. We cannot overstate the value of your invaluable service, and we eagerly anticipate your continued contributions to the RCMI Consortium. Thank you for your commitment and unparalleled achievements, which have left an indelible mark on the RCMI scientific community.

On behalf of the RCMI Abstract Review Committee, Conference Planning Committee, and attendees, we would like to express again our sincere gratitude for your outstanding contributions, and we look forward to your continued support for future conferences.

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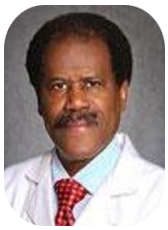

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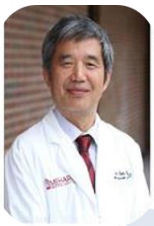

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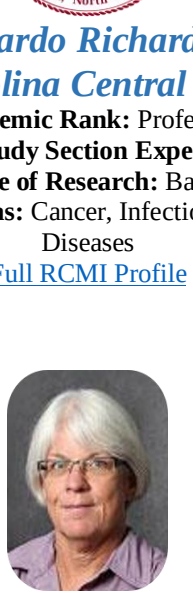

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List of Abstracts

1.0 - BASIC AND APPLIED MINORITY HEALTH AND HEALTH DISPARITIES RESEARCH

MULTI-DIMENSIONS EFFECTS OF COVID19 ON MINORITY POPULATIONS AND FOOD SAFETY IN SOUTHERN USA

Dr. Hafiz Anwar Ahmad
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Abstract

PURPOSE The objective of this research was to comprehend various dimensions of COVID-19 effects, including socioeconomic, behavioral, and food safety, on minority populations, in the southern USA. Besides the human toll, the COVID-19 pandemic has dramatically affected the food system from production to consumption. METHODS: Data for the study were collected from various sources, including the COVID-19 Data tracker of the CDC and the Mississippi Department of Health, for the following southern states: Alabama, Florida, Georgia, Louisiana, Mississippi (82 counties), and Tennessee. The food safety data were collected from The Foodborne Diseases Active Surveillance Network (FoodNet) for 2015-2020. The cumulative Mississippi COVID-19 and socio-demographic data variables were grouped into feature and target variables. The statistical and exploratory data analysis was conducted using Python 3.8.5., including the Pearson Correlation. RESULTS: Significant geographical variations in COVID-19 cases and death rates were observed among various races and ethnic groups. Most cases were observed among the Hispanic and Black populations, and the highest death rates were found among non-Hispanic Blacks and Whites. Asians had the highest vaccination coverage, 77%, compared to 52%, 46%, 42%, and 25% for African Americans, Whites, Hispanics, and American Indians/Alaska Natives, respectively. COVID-19 cases and deaths were positively correlated with per capita income and negatively correlated with the percentage of persons without a high school diploma (age 25+). A significant decline in the incidences of foodborne diseases, 25% and 60%, was observed, with a geographical variation between California and other Study-States. CONCLUSION: Covid-19 had multidimensional adverse effects, on minority and economically marginalized populations in the southern USA, except for the higher vaccination rates among African Americans. It had a positive impact on reducing the incidence of foodborne illnesses.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.06 - Infectious and Immunological Diseases (non-HIV) - RESEARCH ABSTRACT

Grant Support: This research was supported by the National Institutes of Health/National Institute on Minority Health and Health Disparities Grant # 1U54MD015929-01 through the RCMI Center for Health Disparities Research at Jackson State University.

EVALUATION OF THE PHARMACOLOGICAL MECHANISM OF OJT009 AS A NOVEL INHIBITOR OF SEVERE ACUTE RESPIRATORY SYNDROME CORONAVIRUS 2.

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Abstract

The emergence of deadly SARS-CoV-2 variants has made it more imperative to discover novel therapeutics for COVID-19 treatment which are resistant to viral mutations. Therefore, our research has focused on the critical interaction between host entry receptor, Angiotensin-converting enzyme-2 (ACE2) and viral Spike protein RBD region. Although ACE2 facilitates viral entry, it also provides defense against acute lung injury through the renin angiotensin system. Thus, ACE2 must be carefully manipulated without disrupting the balance of the renin angiotensin system. We investigated the effect of OT009 on: a) ACE2-RBD interaction, b) ACE2 expression and c) ACE2 exopeptidase activity, using biochemical, cellular and computational methods. We observed that OJT009 produced a unique does-response curve on the binding affinity of rhACE2 and RBD of SARS-CoV-2 S protein. OJT009 disrupted the interaction of SARS-CoV-2 RBD protein to rhACE2 receptor at lower concentrations ranging from 100 nM to 10 µM; but enhanced the interaction at higher concentrations from 50 µM. To understand the impact of OJT009 on the RAAS pathway we investigated its role on the exopeptidase activity and expression of ACE2. In in enzymatic assays OJT009 only inhibited exopeptidase activity of ACE2 at high concentrations (> 50µm). However, OJT009 did not affect ACE2 expression levels at the same concentrations in cellular assays using A549 cells. Further investigation through computational modeling

studies validated our in-vitro findings suggesting that OJT009 inhibits SARS-CoV-2 viral attachment and entry. We have demonstrated that, while OJT009 inhibits the key interaction between the RBD region of SARS-CoV-2 and ACE2, it does not disrupt ACE2 physiological function within the renin angiotensin system. Thus, OJT009 represents a promising drug class for further evaluation as a lead series in developing chemotherapeutics for COVID-19 treatment.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.06 - Infectious and Immunological Diseases (non-HIV) - RESEARCH ABSTRACT

Grant Support: This research was supported, in part, by research infrastructure support from RCMI grant number 5U54MD007605-28 from NIMHD/NIH.

ANTICANCER EFFECTS OF THYMOQUINONE THROUGH THE MODULATIONS OF NRF2 AND PD-L1 IN RACIALLY DISTINCT HUMAN TRIPLE-NEGATIVE BREAST CANCER CELLS

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Abstract

Triple-negative breast cancer (TNBC) is an aggressive subtype of breast cancer (BC) with a metastatic nature. Progesterone receptor (PR), estrogen receptor (ER), and human epidermal growth factor receptor 2 (HER2) are not expressed in TNBC, restricts the variety of therapies. Oxidative stress and inflammation in the tumor microenvironment (TME) are highly involved in cancer development and progression. They have a strong correlation to nuclear factor-erythroid 2-related factor (Nrf2) and its target molecules downstream, such as Programmed death-ligand (PD-L1). In MDA-MB-231 and MDA-MB-468 TNBC cells, the natural compound thymoquinone (TQ) was tested in the current investigation. The DPPH assay, ROS assay, various antioxidant activities, and the expression of the genes for Nrf2 and PD-L1 are all included in this in vitro research. The results show that TQ exhibits considerable antioxidant activity and significantly decreases the generation of H2O2, increased catalase (CAT) activity and superoxide dismutase (SOD) enzyme levels. Prion protein (PRNP), NAD(P)H dehydrogenase, quinone 1(NQO1), and glutamate-cysteine ligase, modifier subunit (GCLM) were observed to be consistently elevated in both cells, with a large fold change in MDA-MB-468 cells (+157.65 vs. +1.7, +48.87 vs. +2.63 and +4.78 vs. +2.17), respectively. Nrf2 controls the oxidative stress-antioxidant defense mechanism directly or indirectly. Studies were also conducted on how TQ affected the expression of Nrf2 and its downstream targets, PD-L1. Nrf2 mRNA and protein expression were significantly increased in TQ-treated MDA-MB-231 and MDA-MB-468 cells despite being higher in MDA-MB-468 cells (6.67 vs. 4.06). TQ administration increased mRNA levels while decreasing PD-L1 protein expression in both cell lines. In conclusion, TQ modifies the expression of multiple oxidative-stress-antioxidant system genes, ROS, antioxidant enzymes, Nrf2 and PD-L1 protein, pointing to a potential chemopreventive application of TQ in TNBC.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: This research was supported by a grant from the National Institute of Minority Health and Health Disparities of the National Institutes of Health through Grant Number U54 MD 007582

IDENTIFICATION OF OJT003 AS A NOVEL ZINC DEPENDENT INHIBITOR OF SARS-COV-2 RNA-DEPENDENT RNA POLYMERASE AND REPLICATION

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Abstract

PURPOSE SARS-CoV-2 infection remains a global health challenge due to emerging variants evading vaccines. Thus, discovery of safe therapeutics targeting key viral-host interactions is imperative. Earlier, we showed that clinically approved drug, OJT003, was potent against SARS-CoV-2 reference strain infection induced cytopathic effect (CPE) and inhibited a critical viral-host interaction. Here, OJT003 class

displays similar activity against omicron strain, suggesting efficacy against viral mutations, and possibly having multiple targets. OJT003 is a zinc chelator and ionophore, known to inhibit RNA-dependent polymerases (RdRp) activity in some RNA viruses. SARS-CoV-2 RdRp is a zinc-dependent enzyme, crucial for viral replication and can be inhibited by zinc ionophores. We hypothesize that OJT003 acts as a zinc ionophore and inhibits SARS-CoV-2 RdRp, thereby disrupting viral replication, resulting in antiviral activity. METHODS Antiviral activity of OJT003 and analogues with zinc in SARS-CoV-2 infected A549 cells was assessed using a nano-luciferase reporter virus assay. Next, we conducted computational studies to examine structure-activity relationship of OJT003 class with SARS-CoV-2 RdRp. Finally, with a enzymatic assay, we examined the effect of OJT003 on SARS-CoV-2 RdRp with zinc. RESULTS We observed additive and synergistic interaction of OJT003 and zinc combination treatment in SARS-CoV-2 infection using nano-luciferase reporter virus assay. OJT003 exhibited lower IC50 in the presence of zinc, suggesting antiviral activity may be related to zinc chelation or coordination. Computational analysis revealed inhibitory potential of OJT003 class with SARS-CoV-2 RdRp. In enzymatic assays, OJT003 inhibited RdRp activity in a dose-dependent manner with greater inhibition in the presence of zinc. CONCLUSION Findings suggest that OJT003 acts as a zinc ionophore and inhibits SARS-CoV-2 RdRp, thereby disrupting viral replication resulting in antiviral activity.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.06 - Infectious and Immunological Diseases (non-HIV) - RESEARCH ABSTRACT

Grant Support: This project is supported by the National Institute on Minority Health and Health Disparities of the National Institutes of Health (NIH) under award number 2 U54 MD007605-27A1. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

VIABILITY OF MICROGLIA ANALYSIS ON VARYING TISSUE THICKNESS

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Abstract

PURPOSE Microglial morphology provides important data associated with immunoresponse and pathogenesis following traumatic brain injury (TBI). Microglia are known for high heterogeneity that usually require acquisition of 3D confocal images to reveal their morphology. Recent advancements in computer aided analysis provide a great potential to quantify these variable cells using easy-to-acquire 2D histological images. The purpose of this study is to determine the effect that slice thickness may have on quantifying microglial morphology. METHODS Iba1 images of 12 rat brains were acquired by a confocal microscope. Microglial morphology was reconstructed in 3D by the MotiQ toolbox as the gold standard. 2D images were reconstructed in 5, 10, 20, 30, 40 µm by average-intensity back projection. Cells were classified from surveillant to activated, and morphological parameters such as ramification index were calculated and compared to the 3D results to determine the thickness at which sufficient morphology information is present. RESULTS Thin slices (<20um) provided less reliable identification of the cell's morphological phenotypes. On the other hand, thicker tissue (>20um) provided morphological analysis much closer to the gold standard. For every category of microglia, ramification index and X/Y span agreement varied greatly between 2D and 3D on thin slices. Thicker slices had much higher agreement between 2D and 3D for these parameters. However, with more activated categories of microglia that are smaller, such as amoeboid, the 2D/3D parameter differences were less stark. DISCUSSION / CONCLUSION A slice thickness threshold for high-quality identification of microglial morphological features was determined for 2D (>20µm). Above this threshold, the cell's features can be resolved comparably to the 'gold standard' 3D analysis. The findings also provide a direction for the future of deep learning models to extrapolate the images acquired from different slice thicknesses by transfer lea

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.09 - Neuroscience and Mental Health - RESEARCH ABSTRACT

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FUCOXANTHIN, A MARINE XANTHOPHYLL, UTILIZATION AS A PROMISING COMPOUND FOR TRIPLE-NEGATIVE BREAST CANCER PREVENTION AND THERAPY

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Abstract

The second most common cancer is breast cancer (BC), among women in the U.S. Triple-negative breast cancer (TNBC) is an aggressive subtype of BC, accounting for 10-15% of all BC. Many natural products fight against BC progression and tumor development by inhibition of proliferation and angiogenesis, induction of cell cycle arrest and apoptosis, and modulation of signaling pathways. PURPOSE: The pharmacological effects of natural compound fucoxanthin, a xanthophyll isolated from brown macroalgae, are studied in genetically different MDA-MB-231 (Caucasian) and MDA-MB-468 (African American) TNBC cell lines. METHODS: Cytotoxic assays, angiogenic arrays, RT-PCR, apoptosis, cell cycle, migration assays, and PI3K/AKT signaling RT-PCR arrays were performed. RESULTS: Fucoxanthin (1.56 - 300 µM) reduced cell viability in both cell lines in a dose and time-response manner, showing higher potency in MDA-MB-468. Fucoxanthin had similar anti-proliferative effects in MDA-MB-468 and MDA-MB-231 cells after 48 and 72h. Angiogenesis studies showed that fucoxanthin (6.25 µM) downregulates VEGF-A and VEGF-C expression in TNF-α-stimulated (50 ng/ml) MDA-MB-231 cells but not in MDA-MB-468 cells. Fucoxanthin induced cell cycle arrest at G1 phase in both cell lines, higher arrest at S phase in MDA-MB-231 cells, and higher arrest at G2 phase in MDA-MB-468 cells. Fucoxanthin induced apoptosis in MDA-MB-231 cells, with no effect in MDA-MB-468 cells. Also, fucoxanthin inhibited migration in both cell lines and was more effective in MDA-MB-231 cells at a shorter time period. Moreover, PI3K/AKT signaling pathway RT-PCR array studies showed that in TNF-α-stimulated MDA-MB-231 and MDA-MB-468 cells, fucoxanthin (6.25 µM) modulated mRNA expression of 13 genes. CONCLUSION: Fucoxanthin targeted VEGF-A and VEGF-C, showed anti-proliferation and anti-migration effects, induced cell cycle arrest and apoptosis, and modulated genes of the PI3K/AKT signaling pathway, showing potential as a therapeutic against BC.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities4.04 - Pharmaceutical Sciences / Pharmacokinetics / Drug Discovery and Delivery - RESEARCH ABSTRACT

Grant Support: National Institute of Minority Health and Health Disparities of the NIH U54 MD007582.

PREDICTIVE FACTORS FOR AGGRESSIVE PROSTATE CANCER AMONG BLACK MEN

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Abstract

PURPOSE: Prostate cancer (PCa) is one of the most common types of cancer in men. Blacks have a higher mortality rate from PCa and are more likely to be diagnosed at a clinically advanced stage henceforth referred to as aggressive PCa (aPCa). The objective of this study is to identify factors from patient-related and social determinants of health (SDOH) factors associated with aPCa among Black men. METHODS: Patient-related and SDOH factors from Black and white patients with PCa from a large cancer center from 2016 to 2021 was analyzed. The study received Institutional Board Review approval. RESULTS: Among the 866 Black men cohort, 443 had aPCa while 423 had non-aPCa. Mean diagnosis age was 65 years among all patients. The result of this study showed an association between older age and aPCa among black men. Analysis showed Area deprivation index with odds ratio (OR) 0.884, p-value <0.05, use of thiazide-like diuretic OR: 0.611, p-value <0.05, use of angiotensin-2-receptor antagonists with odds ratio of 0.698, p-value <0.1 and use of direct vasodilators OR:1.628, p-value <0.1. CONCLUSION: Consistent with existing literature and data, our study showed that older age correlates with aPCa among black men. Although literature shows inconsistent association with PCa risk and medications, our study evaluated the risk of developing aPCa among Black patients with PCa. Hence, our study that suggests the use of thiazide-like diuretics and angiotensin-2-receptor antagonists may protect against developing aPCa while the use direct vasodilators may increase the risk of developing aPCa is hypothesis generating. Our study showed that black men living in an economically-disadvantaged neighborhood were more likely to have aPCa. Our finding suggests that living in an economically-disadvantaged neighborhood may increase the risk of developing aPCa is hypothesis generating that would need to be confirmed against the existing literature and validated in future studies.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

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SOCIOECONOMIC IMPACTS OF COVID-19 PANDEMIC ON FOODBORNE ILLNESSES IN THE UNITED STATES

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Abstract

PURPOSE: Foodborne diseases continue to impact human health and the economy. The COVID-19 pandemic has dramatically affected the food system from production to consumption. This project aims to determine the impact of the COVID-19 pandemic on the spread of foodborne diseases and the factors that may have contributed, including environmental, behavioral, political, and socioeconomic. METHODS: Data for this study were collected from The Foodborne Diseases Active Surveillance Network (FoodNet) for 2015-2020. FoodNet personnel located at state health departments regularly contact the clinical laboratories in Connecticut (CT), Georgia (GA), Maryland (MD), Minnesota (MN), New Mexico (NM), Oregon (OR), Tennessee (TN), and selected counties in California (CA), Colorado (CO), and New York (NY). Data were analyzed using SAS to determine the changes in foodborne pathogens rates reported in FoodNet before and during the COVID-19 pandemic in the ten reporting states. RESULTS: Results of the study showed a significant decline in the incidences of foodborne diseases ranging between 25% and 60%, with Salmonella and Campylobacter being the highest reported pathogens. A geographical variation was also observed between the states. California reported the highest decline rate of foodborne illnesses. DISCUSSION / CONCLUSION: Several factors may have contributed to such a decline in incidences of foodborne diseases. These factors may be environmental, behavioral, political, economic, or social. Preventive measures taken during the pandemic may have also contributed to the reduction of rates of foodborne diseases.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.06 - Infectious and Immunological Diseases (non-HIV) - RESEARCH ABSTRACT

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TELOMERE LENGTH IN SALIVA IS INDEPENDENTLY ASSOCIATED WITH HIV STATUS, BIOLOGICAL SEX AND LEVELS OF ACETATE IN PUERTO RICANS

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Abstract

People with HIV (PWH) experience age-related comorbidities more frequently and earlier in life than people without HIV (PWOH). Telomere length is a marker of biological aging, but has not been characterized in human saliva in PWH. We quantified telomere length and compared it to HIV status, biological sex, oral inflammation, and microbial products. We evaluated saliva from 20 PWH and 10 PWOH at PR CoNCRA, a community clinic in San Juan, Puerto Rico. Age and biological sex were similar (PWH: median age 47 [IQR 35-57], 50% male; PWOH: median age 44 [IQR 33-56], 50% male). DNA extracted from saliva was used to measure telomere length (T/S ratio) via qPCR. We measured markers of inflammation (IL-2, IL-6, and IL-8) and short-chain fatty acids (acetate, propionate, and butyrate) in saliva by ELISA or GC-MS. Statistical analysis was performed in R. PWH had significantly shorter mean T/S ratio in saliva than PWOH (1.68 vs. 1.85, Cohen's d=0.64, p=0.04). T/S ratio was also shorter in females than in males (1.60 vs. 1.84, Cohen's d=0.75, p<0.01). No statistically significant

associations were present between T/S ratio and individual antiretroviral therapy (ART) drugs. Shorter T/S ratio was also associated with higher levels of acetate (r=-0.53, p<0.01) and IL-6 (r=-0.48, p=0.01) in saliva. Multivariable analysis identified that shorter T/S ratio remained associated with higher levels of acetate in saliva, HIV status, and biological sex (Model R^2=0.51, p< 0.01). Telomere length in saliva may represent a novel and accessible biomarker of aging in PWH. Biological sex disparities in telomere length might explain disparities in accelerated aging-related comorbidities such as neurocognitive disorders, which disproportionally affect women. The higher levels of acetate and IL-6 suggest that the microbiome and local inflammation contribute to biological aging in the oral cavity. Overall, these novel findings contribute to the growing literature on premature biological aging in PWH.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.05 - HIV and AIDS - RESEARCH ABSTRACT

Grant Support: This project was supported by the National Cancer Institute: CAPAC Program R25 CA240120, Diversity Supplement 3R21CA264606-01S1 and U54 CA096297. This project was also supported by the National Institute on Minority Health and Health Disparities: RCMI Program U54 MD007600. This project was also supported by the National Human Genome Research Institute through the program Increasing Diversity in Genomics for the Next generation (IDGeNe) R25 HG012702. We would also like to thank Puerto Rico-Community Network for Clinical Research on Aids (PR-CoNCRA) and Hispanic Alliance for Clinical & Translational Research (U54 GM133807) for providing us with support in recruitment and specimen collection, and especially to our study participants.

ROLE OF MDSC IN CHRONIC STRESS-INDUCED OVARIAN CANCER GROWTH

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Abstract

PURPOSE Ovarian cancer (OC) is the fifth-leading cause of cancer death among females in the United States. Myeloid-Derived Suppressor Cells (MDSCs) are immature and immunosuppressive cells that play a key role in the tumor microenvironment (TME). Tumor-associated MDSCs aid immune evasion and are associated with poor prognosis in cancer patients. Chronic stress has been shown to increase tumor-associated inflammation and promote immune escape. However, the role of chronic stress on MDSCs infiltration and function in OC is poorly understood. This study aims to determine the role of chronic restraint stress on MDSCs infiltration and biology in the TME. We hypothesize that restraint stress results in increased MDSCs infiltration into TME. METHODS We inoculated 3- to 4-month-old C57BL/6 female mice with ID8 or IG10 ovarian cancer cells and subjected them to restraint stress (2 hours daily) for 6-8 weeks. Unstressed mice were used as controls. Upon sacrifice, tumors were collected for immunofluorescence (IF) and flow cytometry (FC) analyses. IF and FC were used to characterize MDSCs by the expression of cell surface markers (CD11b+ and Gr-1+ (Ly-6G/Ly-6C)). RESULTS Our results suggest that chronic restraint stress led to increased infiltration of MDSCs in the TME in ID8 (p=0.0018) and IG10 (p=0.0018) mouse models. In addition, FC results show an increased infiltration of MDSCs (CD11b+/Ly-6G) (p=0.04) in IG10 tumors. CONCLUSION These data suggest that chronic stress may modulate the OC TME, specifically the regulation and function of MDSCs, which could contribute to an immunosuppressive TME and OC progression.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: R21CA253555 U54MD007579 U54CA163071 U54CA163068

HIV-1 INTEGRASE INHIBITORS AND NEUROPSYCHIATRIC EFFECTS

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Abstract

PURPOSE The HIV-1 integrase strand transfer inhibitors (INSTIs) are generally considered to be safe and effective. However, there is growing concern about higher rates of neuropsychiatric adverse events (NPAE) reported in HIV-infected patients on newer INSTIs, especially dolutegravir (DTG). Our hypothesis is that DTG-associated NPAEs are a result of disrupted neuronal communication in brain circuitry linked to neuropsychiatric disorders. Our goal is to identify and characterize the underlying molecular mechanism(s). METHODS Differentiated SH-SY5Y cells treated with physiologically relevant concentrations of DTG or raltegravir (RAL) were assessed for: neuronal cytotoxicity by measurement of intracellular reactive oxygen species and lactate dehydrogenase release; alterations in morphology and neurite outgrowth by bright-field microscopy; and changes in synaptic protein and extracellular glutamate levels by western blot and spectrophotometric method, respectively. Potential INSTI-induced differential gene expression patterns were examined by next generation RNA-sequencing. The data was analyzed to identify pathways functionally linked to neurological disorders, and alterations in expression of selected genes were verified by quantitative polymerase chain reaction (qPCR) analysis. RESULTS Compared to the control and RAL-treated cells, DTG-treated cells exhibited a (1) marked reduction in neurite outgrowth, (2) striking decline in post-synaptic protein levels, (3) pronounced elevation in extracellular glutamate levels, and (4) distinct gene expression pattern denoting altered glutamate neurotransmission and calcium signaling. Notably, DTG-induced upregulation of specific T-type calcium channel proteins and a glutamate receptor subunit were verified in qPCR analysis. DISCUSSION / CONCLUSION These results identify key players and pathways mediating DTG-induced dysfunction in neuronal communication, potentially leading to DTG-associated NPAEs.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.05 - HIV and AIDS - RESEARCH ABSTRACT

Grant Support: These studies are supported in part by the NIH Grants: U54MD007586-36, R01DA057204-01.

DIGITAL SPATIAL PROFILING OF TUMOR AND TUMOR MICROENVIRONMENT OF TRIPLE NEGATIVE BREAST CANCER IN PATIENTS OF AFRICAN AMERICAN AND EUROPEAN AMERICAN DESCENT

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Abstract

Breast cancer is not only a heterogenous disease by itself but it also has a differential racial impact. Triple-negative breast cancer (TNBC) is an aggressive breast cancer subtype that disproportionately affects women of African origin. Understanding the underlying biology of the tumor and its microenvironment is critical to address the disparity associated with racial differences in breast cancer. The NanoString GeoMx spatial profiling is a multiplexed platform that spatially resolves and quantifies the abundance of genes present in tumor and stroma. Utilizing this technique, we have determined the differential gene expression in tumor epithelial cells and its associated stroma in AA and EA TNBC patients (n=8). Gene expression from spatially defined regions in tumor and stroma in each patient and in between races identified distinct molecular pathways. The tumor epithelial region of AA has high expression of fatty acid biosynthesis, nucleotide excision repair, and exhaustion signaling while EA tumor epithelial region had high expression of neuropilin 2, interferon signaling and TGF beta signaling. The pathways overexpressed in the AA stromal region included tryptophan metabolism, chemokine signaling pathway, interferon signaling and exhaustion signature while in the EA stromal region, the pathways pertinent to mTOR signaling, regulators of AURORA kinase, cysteine endopeptidases were more prominently expressed. AA tumors exhibited high infiltration of immune cells than EA. The stromal region of AA tumors has high population of macrophages, CD8 T memory, Treg's and neutrophils more than EA tumors. The tumor epithelial region of AA has high infiltration of plasmacytoid dendritic cells, monocytes, natural killer cells, CD4 memory, naïve, Treg's and plasma cells. However, the exhaustion signature proteins, PDCD1 and LAG3 were also higher in tumor-infiltrated as well as stromal immune cells in AA tumor as compared to EA. We have spatial profiled AA and EA TNBC and assessed th

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

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NOVEL MST1R SNPS SHOW A POTENTIAL ROLE IN DRIVING LEUKEMIA

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Abstract

PURPOSE: Acute lymphoblastic leukemia (ALL) is a malignant transformation of lymphoid progenitor cells in the bone marrow, blood, and extramedullary sites. ALL incidence rates, including relapse, are higher in Hispanic Americans compared to Caucasian Americans. These disparities in ALL occurrences are significant to our region, U.S.-Mexico border, which has a larger population of Hispanic Mexican Americans. To further understand the genetic drivers related to this cancer health disparity, we performed whole exome sequencing (WES) of genomic DNA from ALL patient samples obtained through the UTEP Biorepository. Sorting of NGS data revealed deleterious single nucleotide polymorphisms (SNPs) within the protein tyrosine kinase MST1R. This protein, also known as RON, is a transmembrane protein related to the c-MET tyrosine kinase receptor family. Mutations of MST1R play a role in proliferation, survival, angiogenesis, chemoresistance, migration, and invasion.METHODS: In the present study, we utilized WES and the UTEP bioinformatics pipeline OncoMiner to discover eight novel SNPs in MST1R within nine ALL samples. OncoMiner uses a PROVEAN score, an alignment-based algorithm, that can predict the functional impact for a variety of protein sequence variations. Additionally, we modeled the mutations within the receptor using the ChimeraX Software to predict the functional influence of the newly identified mutations on MST1R. RESULTS: WES coupled to the bioinformatics analysis of ALL samples from the UTEP Biorepository led to the identification of eight novel deleterious mutations within MST1R that could be linked to oncogenic signaling. Protein modeling analysis revealed that the mutations are located near the activation and docking sites of MST1R. CONCLUSION: These novel mutations could play a critical role in mediating the activation of MST1R receptor given their location within the structure. Further analysis of these mutations needs to be conducted to determine their role in ALL.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

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REGULATORY SPECTRUM OF CHEMOSENSORY ABILITIES: GENETIC AND EPIGENETIC FACTORS AT NEURODEVELOPMENT TO AGE-RELATED NEURODEGENERATION.

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Abstract

Olfactory dysfunction is a well-established marker of the aging population and subsections of population suffering with neurodegenerative conditions such as Parkinson's and Alzheimer's diseases. Additionally, groups of individuals suffering with other disorders causing degenerative neuropathology, depressive disorders, progressive memory loss, and normal age-based decline in physiological functions as well as communication disorders also display a range of olfactory deficits and/or olfactory dysfunction. Since last almost three years of COVID-19 pandemic, loss of olfaction followed by loss of gustation has been widely observed and analyzed in COVID and long COVID cases, we have conducted a comprehensive literature review and determined these findings. Previously, similar effects were evident in research studies with other viral conditions. Olfactory bulb neurons are known to play a crucial role in normal physiological function, their functional deviation correlates with emergence of neuropathological pathological features as they transmit impulses to higher cortical and limbic structures. Unlike neurodegenerative conditions, autism and other autism spectrum disorders are neurodevelopmental disorders that come under the category of communication disorders. These conditions have complex etiology as polygenic component predominates the extent of symptoms; those develop early in life and are thought to be outcome of genetic factors that control neural circuit assembly and synaptic wiring. Thus we have a wide spectrum where olfaction modulates communication ability early in the development and then later in life mature but much used olfactory system displays olfactory dysfunction/deficits as prodromal marker of neurodegeneration. We attempt to understand and analyze the

pathways that olfactory system follows in between these two time points while it comes under the influence and of genetic and epigenetic factors that modulate physiological and behavioral symptoms.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.09 - Neuroscience and Mental Health - RESEARCH ABSTRACT

Grant Support: This work resulted in part from research support to T.H. from NSF (IOS-1355034), NIH (P30AI117970), and Howard University College of Medicine.

FEASIBILITY AND ACCEPTABILITY OF RESILIENCE-FOCUSED PERSONALIZED HEALTH REPORTS FOLLOWING RAPID ANTIRETROVIRAL THERAPY FOR NEWLY DIAGNOSED PERSONS WITH HIV

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Abstract

Purpose: Persons with HIV (PWH) experience multi-level barriers to antiretroviral therapy (ART) adherence. While resilience-focused personalized health reports (RPRH) have potential to improve HIV care management, interventions are needed to address barriers among PWH. Methods: Between July 2022-March 2023, all newly diagnosed PWH receiving rapid ART (<7 days of care) from an HIV Service Organization were eligible for an observational study. Participants were asked to complete self-administered online surveys assessing resilience-focused HIV care: ART adherence, trauma exposures/response, and perceived safety in care institution. Data were synthesized into RPHRs and delivered to participants at ~two weeks to assess intervention feasibility and acceptability. Descriptive statistics were analyzed to assess preliminary results. Results: Most participants (N=25) identified as male gender (68%) and Black, same-gender-loving (72%), averaged 33 years old, never/rarely missed pills (73%) (>27% sometimes/often), met criteria for post-traumatic stress disorder (60%), and perceived clinics to have high levels of trust/support but lower levels of trauma responsive services and impacts of provider trauma training. At follow-up (N=16), 94% reported positive/very-positive experiences and comfort completing surveys, with 57% likely/very-likely to talk further with a counselor, and scores indicating the RPRH intervention was acceptable and feasible. Conclusion: Participants reported high levels of trauma and resilience, and PRHR intervention was found to be feasible and acceptable and an overall positive experience. Future research will explore impact of PRHR on treatment plan adherence.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.05 - HIV and AIDS - RESEARCH ABSTRACT

Grant Support: U24MD15970

COMBINATION INHIBITION OF KDM5B AND SKP2 INDUCES SENESCENCE IN CASTRATION RESISTANT PROSTATE CANCER CELLS

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Abstract

Prostate cancer (PCa) is the second-leading cause of cancer mortalities and morbidities in the United States and is the most commonly diagnosed malignancy in African American men. Despite the fact that androgen deprivation therapy is the first-line option to initial responses, most PCa patients invariably develop castration-resistant prostate cancer (CRPC). CRPC is a lethal type of malignancy, therefore, the novel and effective treatment strategies are needed. The goal of this study was to evaluate the combination treatment of small molecule inhibitors, SZL-P1-41, a SKP2 target and PBIT, a KDM5B target on PCa growth and progression; as well as, to delineate the underlying mechanisms of suppressing CRPC. Literature reports that S-Phase-Kinase-Associated-Protein-2 (SKP2) is upregulated in PCa and Lysine-specific-demethylase-5B (KDM5B) serves as a histone demethylase with a crucial role in cancers. Studies showed that KDM5B is increased in human PCa and KDM5B knockout decreases carcinogenic properties of PCa cells. We previously reported that SKP2 loss partially decreases the

growth of prostate tumors and that KDM5B levels are reversely regulated by SKP2 in PCa cells. However, mechanisms of KDM5B and SKP2 interplay on PCa malignancy is unknown. We hypothesize that combination of PBIT and SZL-P1-41 treatment will enhance anti-cancer effects on PCa progression by inducing cellular senescence. Here, we showed that inhibition of KDM5B and SKP2 decreased the proliferation of PCa cells, and KDM5B KO cells were more vulnerable to SKP2 inhibition. More importantly, a combined inhibition of KDM5B and SKP2 significantly blocked malignant transformation of PCa cells. Mechanistically, combined treatments resulted in a decrease in AKT signaling and an induction of cellular senescence. Taken together, our results show that combined inhibition of KDM5B and SKP2 is more efficacious in inhibiting proliferation and growth in CRPC cells, and this regimen would be an ideal therapeutic approach.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

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HEALTH DISPARITIES AMONG PATIENTS WITH SUBSTANCE USE DISORDERS FROM THE UNDERSERVED COMMUNITIES

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Abstract

Purpose Individuals with substance use disorders (SUD) are at particular risk for developing one or more chronic diseases. Various barriers exist contributing to differences in seeking treatment for SUD, which may potential contribute to the long-term outcome of developing chronic conditions. This study aims to investigate the association of gender and race with chronic conditions for patients from underserved communities who had at least one SUD condition. Methods We conducted cross-sectional cohort study and analyzed electronic health records at Meharry Medical Center between January 1, 2017 and December 31, 2021. The patient cohort was defined using administrative ICD10 codes if one of the reasons for hospital visit was due to SUD including cocaine, cannabis, opioid, alcohol, other psychoactive, or other stimulant. The index hospital visit is defined as the most recent hospital visit. The primary outcomes are chronic conditions, i.e., diabetes, kidney disease, and hypertension. In addition, age, gender, race/ethnicity, obesity, depression, HIV, and number of hospital visits were extracted. We built logistic regression for each outcome using all other variables as predictors. Odds ratio with 95% confidence interval were reported. Results Among the identified patients (n=1,632), the median age was 53 (42, 59) and majority were male (63.2%). The patients were Whites (31.3%), Blacks (62.7%), Hispanics (1.5%), and Other (4.5%). The patients had diabetes (20.5%), kidney disease (12.7%), hypertension (56.3%), depression (19.5%), obesity (12.7%), and HIV (5%). Comparing with men, women were more likely to develop diabetes (OR: 1.34 [1.02, 1.77]). Comparing with White, Blacks were more likely to develop diabetes (OR:2.23 [1.59,3.12]), kidney disease (OR: 2.5 [1.6, 3.9], hypertension (OR: 1.78 [1.38, 2.29]). Conclusion The study suggests difference existed between men and women, and among patients of different race/ethnicity for developing chronic conditions. Further study is ne

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.09 - Neuroscience and Mental Health - RESEARCH ABSTRACT

Grant Support: This work is supported by pilot grant from The Research Advisory Council and Office for Research & Innovation at Meharry Medical College.

PODCASTING HIV PREVENTION WEBISODE FOR AFRICAN AMERICANS

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Abstract

HIV remains a concern among African American (AA) heterosexual adults, 20-54 years old. AA comprised 42% of newly diagnosed HIV cases; and heterosexual sexual contact comprised 34% of new cases among African Americans (CDC, 2021). PURPOSE: The present study is part of a special interest grant, funded by NIMHD, which aims to reduce HIV through prevention education and testing behaviors. METHODS: A mixed-methods embedded 2-phase quasi-experimental design was used to identify pertinent themes of HIV prevention and create a testable, novel video webisode intervention. Phase 1 consisted of 5 community focus groups (N=25) with heterosexual AA males and females (Mage=36yo) and was used to inform Phase 2, the live-production development and testing of a HIV prevention video webisode that will be podcasted to the community through dissemination efforts. RESULTS: Themes for AA males included: Pregnancy more important than HIV/STIs; Myth that HIV is not serious (in lieu of PreP, detection reducing medications, etc.); and HIV risk ascertained by "how she looks." Themes for AA females included: Condoms readily available means promiscuous; Being together so long means trust, so no condom needed; and Parents (mother specifically) didn't talk about sex/condoms. Phase 2 consists of pretesting, video viewing (intervention), post-testing, and 3mo follow-up of N=164 heterosexual AA. Phase 2 facilitation is ongoing (currently N=64), and preliminary results indicate that the intervention is particularly promising in increasing HIV knowledge at post-test ($p<.001$) and self-efficacy for condom use partner communication ($p<.001$). Other indicators of effectiveness will be delineated. DISCUSSION: It is beneficial that AA have culturally appropriate public health messaging to which they can relate. Implications for HIV prevention involve relevant approaches and accurate knowledge to increase HIV prevention behaviors for AA heterosexual adults.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.05 - HIV and AIDS - RESEARCH ABSTRACT

Grant Support: THE NATIONAL INSTITUTE ON MINORITY HEALTH & HEALTH DISPARITIES (U54MD015946)

STRUCTURAL-FUNCTIONAL ANALYSIS OF JAK3 Y841 PHOSPHORYLATION

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Abstract

PURPOSE: Janus tyrosine kinase 3 (JAK3), primarily expressed in immune cells, is essential for signaling by the Interleukin-2 (IL-2) family of cytokines. Abnormal JAK3 signal transduction can manifest as hematological disorders e.g. leukemia, severe combined immunodeficiency (SCID) and autoimmune disease states. To date five known JAK3 regulatory sites (Y785, Y904, Y939, Y980 and Y981) have been identified. METHODS: A proteomics approach coupling a JAK3 autokinase assay to mass spectrometry revealed a previously unreported phosphorylation site, Y841, localized within the JAK3 kinase domain (JH1). Functional and structural analysis were performed to investigate the role of JAK3 Y841 phosphorylation in modifying kinase activity and IL-2 receptor signaling. RESULTS: This study found that Y841 is evolutionarily conserved across multiple species and JAK family members. JAK3 was further found to be constitutively phosphorylated and un-responsive to IL-2. Phospho-specific Y841-JAK3 antibodies recognized constitutively activated JAK3 in various T-cell lines. Computational biophysics methods link Y841 phosphorylation to enhanced JAK3 JH1 domain stability in acid and weak base environments as well as to complementary electrostatic dimer formation. DISCUSSION/CONCULSION: Our results propose a model of JAK3 kinase domain dimerization where pY841 plays an important role in complex formation and cytokine signal transduction. Based on the proposed model, regions within the JAK3 JH1-dimer binding interface may be exploited for the therapeutic disruption of constitutively activated JAKs within immune disorders.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities6.07 - Proteomics - RESEARCH ABSTRACT

Grant Support: This work was supported by grants from the National Institute on Minority Health and Health Disparities, a component of the National Institutes of Health (5U54MD007592).

DESIGN OF EXPERIMENT (DOE) FOR OPTIMIZATION OF PARENTERAL PLGA NANOPARTICLE BY HIGH PRESSURE HOMOGENIZATION

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Abstract

Solubility enhancement through formulation for parenteral administration is problematic for poorly water-soluble drugs in preclinical development. Nanoparticles (NPs) fabricated from an FDA-approved polymer, polylactic-co-glycolic acid (PLGA), have recently been explored as an alternative to the commercial solvent-based drug solubilization approach. However, conventional methods, such as solvent evaporation or diffusion, are often compromised by particle aggregation, nonuniform particle size, low payload, and batch-to-batch inconsistencies. This study explored a new parenteral PLGA NPs preparation for the early-stage development of drug candidates using animal models. Design Expert, a DOE software, established a framework and methodology for us to evaluate critical processing parameters (CPPs) like drug content, PLGA concentration, and solvent fraction during PLGA synthesis. Single emulsion followed by high-pressure homogenization was employed in the current work to prepare PLGA NPs incorporating a BCS class II compound AC1LPSZG. This work was robust and versatile, providing stable AC1LPSZG-loaded PLGA NPs with tunable size and encapsulation efficiency (EE). The prepared drug-loaded PLGA NPs had a size of 120-200 nm, and the EE ranged from 40 to 52%, depending on composition and homogenization procedure. Colloidal dispersions of PLGA after evaporation or lyophilization are stable during short-term storage at 4°C. Drug delivery and safety of PLGA product were evaluated in jugular vein cannulated rats at a 2.5 mg/kg dose. Compared to other cosolvent formulations, the decreased exposure and shorter half-time indicated a rapid clearance of PLGA NPs in vivo. Rats showed no side effects under carefully monitored conditions. DOE allows looking at the individual and combined impact of various factors for optimizing PLGA-drug formulations. Emulsification with high-pressure homogenization provides a reliable and controllable approach on developing PLGA NPs for parenteral delivery.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.08 - Nanotechnologies - RESEARCH ABSTRACT

Grant Support: Study was funded by Cancer Prevention & Research Institute of Texas Core Facilities Support Awards (RP180748) and NIH's Research Centers in Minority Institutes Program (RCMI, U54MD007605).

NEUREGULIN-1 (NRG1) SIGNALING SUPPORTS LUTEAL CELL FUNCTIONS.

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Abstract

PURPOSE Formation of a functional corpus luteum (CL) is an absolute requirement for reproductive success. The CL forms from luteinization (luteal cells, LCs) of an ovulated follicle, a process induced by the mid-cycle surge of luteinizing hormone. The CL is the transient heterogeneous ovarian endocrine structure that produces progesterone to maintain embryo implantation and inter-uterine pregnancy. CL defects or luteal phase deficiency contribute to decreasing progesterone production and subsequent inability to support a developing fetus and reproductive failures. NRG1, a member of the epidermal growth factor-like factor family, is gonadotropin dependent, differentially expressed in the follicle, and support follicular maturation. However, the detailed mechanisms associated with the interplay of NRG1 and its receptors (ErbB2 and ErbB3) in CL function are not known. Therefore, we examined the direct effect of NRG1 on LC proliferation and survival. METHODS Rat LCs were treated with or without exogenous NRG1 in a dose-dependent manner for 24hr. The total protein was isolated and analyzed for various markers under these experimental conditions. For characterizing the spatial and temporal expression patterns of NRG1 and ErbB-receptors in CL during pregnancy, ovaries were collected from adult female pregnant rats. Followed by NRG1 and ErbB2/3 were immunolocalized in the fixed ovarian sections. RESULTS Our results suggest that both NRG1 and ErbB2/3 are differentially expressed in CL during pregnancy. Interestingly, both NRG1 and ErbB2/3 are highly expressed in CL on day 14 compared to day 21. Immunoblot analysis indicated that exogenous recombinant NRG1 induces the activation of PI3K/AKT/ERK1/2-signaling pathways..Moreover, the exogenous NRG1-induces phosphorylation of both ErbB2 and ErbB3 receptors with enhanced LC proliferation and viability. CONCLUSIONS These preliminary studies suggest that NRG1-ErbB2/3-signaling may have important physiological roles in LC function.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.04 - Gene-Environment Interactions - RESEARCH ABSTRACT

Grant Support: This study was partly supported by National Institutes of Health Grants 1 SC1 GM130544-01A1, 1SC3GM113751, and G12RR03034. This research was conducted in a facility constructed with support from the Research Facilities Improvement Grant C06RR018386 from the National Institutes of Health National Center for Research Resources.

IDENTIFICATION OF MUTATED MST1 RECEPTOR IN HISPANIC PATIENTS

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Abstract

PURPOSE: Leukemia is a type of cancer that arises from the blood-forming tissues. In the United States, Hispanic children and adolescents have the highest incidence of leukemia. The University of Texas at El Paso (UTEP) Biorepository, established at the Border Biomedical Research Center (BBRC) in UTEP, has facilitated access to numerous tumorigenic samples from local hospitals of the El Paso, TX border region. Given the location of our institution and the demographics of the local region, we can obtain oncological samples from patients of Mexican-American Hispanic origin. Next-Generation Sequencing (NGS) has proved to be a critical tool in profiling oncological samples. Further, identifying single nucleotide polymorphisms (SNPs) can help guide the identification of potential biomarkers or therapeutic targets. One such is MST1R, a c-Met proto-oncogene family member, and its ligand MST1 (or MSP) which are known to be oncogenic when mutated or overexpressed. METHODS: The OncoMiner tool and Illumina BaseSpace applications were utilized to examine twelve Acute Lymphoid Leukemia (ALL) samples. We utilized whole-exome sequencing and, for a subset of samples, we performed transcriptome sequencing to observe differential gene expression. RESULTS / EXPECTED RESULTS There were two novel mutations discovered in the MST1R gene in 83% of the currently evaluated ALL cohort. Further, an in-depth analysis of a subset of samples led to the identification of 138 genes with deleterious mutations. Within these genes, we discovered mutations in MAP2K3 which is involved in the MAPK pathway that can be mediated by MST1R activation. Additionally, the MST1 gene was found to be up-regulated by 1.8 fold in three ALL samples. DISCUSSION / CONCLUSION Taken together, we identified mutations within the signaling pathway of MST1R. These mutations could be contributing to the maintenance of the malignant phenotype of ALL. This evaluation could aid in identifying therapies and influencing diagnosis for ALL.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

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TRYPANOSOMA CRUZI DYSREGULATES PIRNAS TARGETING TGFß1

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Abstract

PURPOSE: Trypanosoma cruzi, the etiological agent of Chagas Disease, causes severe morbidity, mortality, and economic burden. Globalization has increased parasite presence in most industrialized countries. About 40% of infected individuals will develop severe cardiovascular, neurological, or gastrointestinal pathologies. Transforming growth factor beta-1 (TGFB1) plays important roles during T. cruzi infection and pathogenesis. T. cruzi activates host TGFB1 to promote cell invasion and pathology. Although TGF-β is absolutely essential for parasite infection, little is known about the influence of regulatory, small non-coding RNA (sncRNA) on TGFB1 expression during infection. PIWI-interacting RNAs are a class of sncRNA with several regulatory roles in germ and somatic cells. We identified piRNAs dysregulated by T. cruzi in primary human cardiac myocytes (PHCM) challenged by the parasite and predicted their interactions with TGFB1. METHODS: We challenged PHCM with T. cruzi trypomastigotes for 1 and 2 hours (with an uninfected control) and the purified small RNA was subjected to RNA-Seq. Piano was used to identify piRNAs and NOISeq was used for differential expression analysis. RNA22

and miRanda were used to predict piRNA interaction sites on TGFB1. A TGF-β biological interaction network was constructed with GeneMANIA and visualized with Gephi. RESULTS: Eight differentially expressed piRNAs were computationally predicted to target TGFB1. The piRNA binding sites were located in exon 1 and the 5' UTR. Furthermore, npiR_587 and npiR_573 could also target TGFBR3, SAR1A, FSTL1, TBX21, and DAXX, which are within one degree of biological interaction of TGF-β. DISCUSSION: T. cruzi induced expression of host piRNAs during PHCM challenge. The interaction of these piRNAs with TGFB1 and its related genes suggests roles in T. cruzi infection and pathogenesis: cardiac fibrosis (TGFB1, TGFBR3, DAXX, and FSTL1), remodeling (TBX21), and sodium transport (SAR1A). Advancement of our under

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.06 - Infectious and Immunological Diseases (non-HIV) - RESEARCH ABSTRACT

Grant Support: T32 AI007281, SC1 AI127352, U54 MD007586

NEW CATHEPSIN L (CATL) INHIBITORS AS A POSSIBLE TREATMENT FOR HEPATOCELLULAR CARCINOMA

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Abstract

PURPOSE: Cathepsin L (CatL), a lysosomal cysteine protease, plays an important role in the occurrence, development, and metastasis of malignant tumors. CatL has been studied as a diagnostic marker as well as a pharmacological target for cancer therapies. Despite tremendous progress in developing novel agents for HCC treatment over the last decade, there are few treatment options for advanced malignant hepatocellular carcinoma (HCC). New CatL inhibitors were investigated in this study for their biochemical activities, antiproliferative effects, and ADME properties. The long-term goal of the research is to make it easier to find and develop CatL inhibitors and analogs as potential anti-hepatocellular carcinoma drugs. Methods: In dose-dependent cell viability and migration tests, the inhibitors' antiproliferative properties were investigated using HCC cell lines. CatL inhibition and drug target selectivity were studied with recombinant and endogenous CatL and CatB. In addition, the inhibitor's ability to generate reactive oxygen species (ROS) in HCC cell lines was tested as well as in vitro ADME studies. RESULT: The inhibitor's ability to suppress tumor growth and associated toxicity in mice was assessed. The inhibitors have antiproliferative effects with low micromolar IC50 values, and the main compound has a time-dependent selective inactivation of recombinant and endogenous CatL. The compound did not produce significant ROS, had a dose-dependent tumor reduction comparable to sorafenib, and was less toxic to the liver than Sorafenib and Doxorubicin. Pharmacokinetics and medicinal chemistry optimization studies in mice are currently being conducted. CONCLUSION: Overall, the CatL inhibitors under investigation appear to be promising candidates for future development as potential HCC treatments.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: GRANT SUPPORT: RCMI 1U54MD015929-01.

EXAMINING THE EFFECT OF MONOSODIUM GLUTAMATE ON GLIOBLASTOMA CELLS

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RM CURTIS; L Akil; PB Tchounwou; K Ndebele

Abstract

PURPOSE Brain cancers make up approximately 2.6% of all cancer deaths in the United States and among these, Gliobastoma multiforme (GBM) is the fastest growing, most aggressive. GBM is extremely lethal and patients typically have a poor prognosis with survival rates lower than 15 months following diagnosis. Although not well-documented, the association between diet and GBM has been surmised. Monosodium glutamate (MSG) is a popular flavor enhancer used worldwide. Studies have shown that chronic exposure to MSG is associated with neurotoxicity, however, the specific role of MSG in GBM is not clear. Membrane-bound complement regulatory proteins (mCRPs) are over-

expressed on the membranes of many cancer cells to assist in the evasion of complement-mediated cytotoxicity. The functional role of mCRPs in MSG-exposed glioblastoma cells has not been investigated, therefore, this study sought to determine the relationship between MSG and mCRPs in GBM. We hypothesized that mCRPs modulate MSG toxicity and enhance the mitogenic potential of glioblastoma cells. METHODS Specific aims were targeted by: (1) assessing the endogenous levels of mCRPs in GBM cell lines through western blot, (2) determining the effect of MSG on proliferation, using MTS assay, (3) quantifying the levels of mCRP expression after MSG exposure using western blot and densitometry, (4) assessing the proportion of cells in each stage of the cell cycle after exposure to MSG using flow cytometry, (5) determining the role of mCRPs and MSG in migration using a wound healing assay. RESULTS Proliferation studies concluded that MSG increases the proliferation of GBM. Western blot analysis revealed an upregulated level of mCRPs and an increased expression of mCRPs in MSG-exposed cells. Cell cycle analysis showed an increase in mitotic cells, upon MSG stimulation. CONCLUSION Taken together, these results suggest that MSG stimulates mCRP production in glioblastoma cells, as a mechanism to evade complement mediated cytotoxicity.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: This research was financially supported by the NIH-RCMI Grant No. 1U54MD015929-01.

INVESTIGATING THE POTENTIAL OF FERROPTOSIS INDUCERS AS A TREATMENT FOR HMGA2 INDUCED PROSTATE CANCER-BONE INTERACTIONS.

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Abstract

Prostate cancer (PCa) mortality is largely due to metastasis to bone. High Mobility Group AT-Hook 2 (HMGA2) is a transcription factor that regulates gene expression and has been linked to tumorigenesis and the metastatic process. We recently demonstrated that overexpression of wild-type/full-length HMGA2 in PCa cells promotes PCa progression through epithelial mesenchymal transition (EMT), while truncated HMGA2 promotes PCa progression through oxidative stress signaling. Ferroptosis is a form of regulated cell death caused by the accumulation of iron-dependent lipid reactive oxygen species (ROS). This form of oxidative stress is a potential target therapy for cancer, as it can induce cell death in cancer cells that are resistant to apoptosis. In this study, we investigated the efficacy of RSL3, a known ferroptosis inducer, in inhibiting prostate cancer-bone interactions. We hypothesized that HMGA2 isoforms mediate prostate cancer bone interactions and may be antagonized by ferroptosis inducer RSL3. LNCaP PCa cells stably overexpressing HMGA2 wild-type, truncated, or Neo (empty vector control) were co-cultured with human bone matrix powder and conditioned media (CM) was collected. Subsequently, the CM was added to parental LNCaP cells with or without RSL3 followed by cell proliferation using MTS assay. Our results indicate that HMGA2 overexpressing cells co-cultured with bone matrix powder increase cell proliferation which is inhibited by RSL3. These findings suggest that ferroptosis inducers such as RSL3 could serve as a potential treatment for PCa bone metastasis. Further research is needed to evaluate the impact of RSL3 treatments and underlying mechanisms.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: NIH/NIGMS/RISE SR25GM060414 and NIH/NIMHD 2U54MD007590; 5U54MD013376-8281.

INTERNAL TARGETING SIGNALS OF TRYPANOSOMA BRUCEI TIM17 ARE LOCATED WITHIN DISTINCT STRUCTURAL MOTIFS

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Abstract

PURPOSE: Mitochondria are multi-functional cellular organelles involved in many processes and dysfunction of these organelles cause a multitude of diseases such as neurodegeneration, aging, cancer, and diabetes. Despite having their own genome, mitochondrial DNA only encodes around 1% of the mitochondrial proteome. The remaining essential proteins are nuclear encoded and must be imported via mitochondrial translocases located in the outer and inner membranes. The channel forming proteins of the inner membrane translocases (Tim17/Tim23 and Tim22) are also nuclear encoded thus requiring import. However, the internal signals within these multi-spanning proteins are not well characterized. Using a homolog of yeast and human Tim17, Tim17 in Trypanosoma brucei (TbTim17), we hypothesize that structural motifs and characteristic amino acids within this protein are important for mitochondrial localization. METHODS: We generated a series of mutants of TbTim17 that deleted different lengths of the N-termini, C-termini, or each transmembrane domain (TMD) successively along with site-directed mutants in Loop 3 to determine the effect of these mutations on mitochondrial targeting. Sub-cellular localization was measured using western blot analysis, confocal microscopy, alkali extraction, and prediction software tools. RESULTS/EXPECTED RESULTS: We found that TbTim17 possess more than one internal targeting signal (ITS) within TMDs 1 and 4. We also further determined that the removal of more than 16 amino acid residues from the C-termini prevented full mitochondrial localization. Lastly, a lysine to alanine switch at residue 122 also hampered localization of TbTim17 into mitochondria. DISCUSSION/CONCLUSION: Overall, it was determined that both TM1 and a portion of TM4 between amino acid residues 121-134 that includes a positively charged residue, K122 are necessary for mitochondrial localization. Identifying targeting signals within these translocases aid manufacture of drug therapies.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.06 - Infectious and Immunological Diseases (non-HIV) - RESEARCH ABSTRACT

Grant Support: This work was supported by the following NIH Grants: 5RO1AI125666, 2SC1GM081146, and R25GM05994.

ELUCIDATING TRANSPORT MECHANISMS OF MEMBRANE PROTEIN VARIANTS THAT CONFER ALZHEIMER'S RISK IN AFRICAN AMERICANS

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Abstract

Alzheimer's disease (AD), the most common cause of dementia in older adults, disproportionally affects African Americans with an incidence rate as much as three times higher, compared to other racial/ethnic groups. Multiple factors contribute to this racial disparity however, an in-depth understanding of the biological or genetic contributions does not exist. Compelling evidence indicate that genetic variants of the lipid transport protein, ABCA7, is more strongly associated with AD in African Americans. To understand how ABCA7 contributes to AD on the molecular level, we used a combination of structural and cell biology techniques. We have found that the ABCA7 T319A variant is that confers risk in African Americans is expressed and localizes to the plasma membrane and has reduced ATPase activity when expressed in human cell lines. Proteomic studies indicate reduced levels of the phospholipase C eta (PLCH1) protein in cells that expressed ABCA7 T319A compared to wild-type. PLCH1 is involved in the metabolism of phosphoinositol bisphosphate PIP2. Our results suggest that this variant may contribute to AD by reducing the levels of PIP2, a phospholipid reported to be decreased in the AD brain. These results provide a framework for targeting mechanisms that can increase PIP2 levels as an effective strategy mitigating AD disparities.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.09 - Neuroscience and Mental Health - RESEARCH ABSTRACT

Grant Support: National Institute of Minority Health and Health Disparities (U54 MD007586-36); Alzheimer's Association ABA-22-975038

MORPHINE-INDUCED METABOLOMIC CHANGES IN REWARD–ADDICTION NEUROCIRCUITRY

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Abstract

PURPOSE: The present study investigates the metabolic changes in the nucleus accumbens (NAc) and medial prefrontal cortex (mPFC) of mice, subjected to repeated subcutaneous administration of morphine (10 mg kg−1 s.c.). METHODS: Localized in vivo 1H spectra were acquired from the NAc and mPFC of the mouse brain using a 9.4T Bruker AVANCE 89mm bore NMR machine and quantified using LCModel software. RESULTS: Morphine induced significant changes in the concentrations of a number of metabolites in both mPFC and NAc. Glutamine increased significantly in both mPFC and NAc. Significant increase in glutamate was also observed at mPFC, but not in NAc. Phosphocreatine and N-acetyl aspartate involved in energy metabolism, decreased significantly in both mPFC and NAc. Other changes following morphine were region specific. Concentrations of the antioxidant neurometabolites taurine, and glutathione increased significantly in NAc; however, taurine decreased and glutathione remained unchanged in mPFC after morphine injection. Inositol, known to be involved in memory impairment, also increased significantly in NAc. CONCLUSION: This localized 1H NMR spectroscopy study is the first noninvasive measurement of concentrations of multiple neurotransmitters and their potentially active metabolites in and around the immediate vicinities of mPFC and NAc in live animals subjected to morphine administration. These results should motivate more localized in vivo NMR spectroscopy studies of the brain metabolites involved in opiate addictions.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.09 - Neuroscience and Mental Health - RESEARCH ABSTRACT

Grant Support: RCMI-Supplement-Pilot Project Grant number GRT000342 (Award number AWD000324)

TRANSCRIPTOMIC ANALYSIS OF PARP INHIBITOR RESPONSE IN TNBC

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Abstract

PURPOSE: Triple-negative breast cancers (TNBCs) are the most aggressive due to the lack of targeted therapy. TNBCs also affect African-American women at a younger age with worse prognosis, thus contributing significantly to cancer health disparity. Given the success of PARP inhibitors on BRCA 1/2 mutated breast cancers and the BRCAness of TNBCs, current FDA-approved PARP inhibitors have shown promising results in treating TNBC cell lines with and without BRCA 1/2 mutations. This study aims to apply whole transcriptome analysis in characterizing genomic signatures and regulatory pathways sensitive to PARP inhibition in TNBCs, regardless of BRCA status. METHOD: Four triple-negative breast cancer cell lines (MDA-MB-231, MDA-MB436, HCC1806, and HCC19307) were treated separately with 10 µM of Olaparib, Niraparib, Rucaparib, and Talazoparib. Following RNA isolation from each cell line, TruSeq Stranded mRNA kit was used to prepare the cDNA libraries. The libraries were sequenced using an Illumina NextSeq550 System. Differentially expressed genes were determined using the Limma-Voom package in RStudio, and pathway/functional analysis was carried out using functional enrichment methods. RESULTS: Our results show shared and unique gene expression signatures downstream of PARP inhibitor treatment in TNBC cells irrespective of BRCA mutation. There are compound-specific gene expression signatures in TNBC cell lines. Gene set enrichment analysis reveals significant differences in affected pathways with and without PARP inhibition and the involvement of homologous repair pathways. CONCLUSION: The mechanism of PARP inhibitor sensitivity seen in various treatments is significant for finding alternative pathways to target in combination drug regimens to treat TNBCs, independent of BRCA status

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: This work was supported by grants from NIH/NCI 1U54CA14393; NIH-NIMHD U54MD007598 to J.V. Vadgama and NIH-NIMHD U54MD007598 Pilot project to PD and National Institutes of Health under award number S21 MD000103 partially supporting PD

ACIPIMOX REVERSES THE CARDIAC PHENOTYPE INDUCED BY E-CIGARETTES

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Abstract

PURPOSE: Electronic cigarettes (e-cigarettes) are a popular alternative to conventional nicotine cigarettes among both smokers and people who have never smoked cigarettes. Nicotine can induce lipolysis in adipose tissue, leading to increased serum free fatty acids (FFAs). Increased levels of FFAs are one of the key elements in generating a proinflammatory response and lead to lipotoxicity. We investigated the effects of acipimox, an antihyperlipidemic drug that blocks lipolysis, on e-cigarette-induced cardiac dysfunction and its associated inflammatory signals and oxidative stress. METHODS: C57BL/6J wild-type mice on high fat diet were exposed to saline, e-cigarettes with nicotine (2.4%), and e-cigarettes (2.4%) plus acipimox for 12 weeks. We then used physiological and molecular assays to discover the mechanisms of e-cigarette-induced cardiac dysfunction normalization by acipimox. RESULTS: Fractional shortening and ejection fraction were decreased in mice exposed to e-cigarettes (2.4%) compared with saline that was normalized with acipimox. Mice exposed to e-cigarettes had increased circulating levels of inflammatory cytokines and FFAs, which were diminished by acipimox. We showed that acipimox suppressed nuclear localization of phospho-p53 induced by e-cigarettes (2.4%). Mice exposed to e-cigarettes (2.4%) had increased cardiac Heme oxygenase 1 protein levels and 4-hydroxynonenal (4-HNE). These markers of oxidative stress were decreased by acipimox. Additionally, treatment with e-cigarettes (2.4%) increased the apurinic/apyrimidinic sites, a marker of oxidative DNA damage which was normalized by acipimox. DISCUSSION: Inhibition of lipolysis with acipimox normalizes the physiological changes induced by e-cigarettes and the associated increase in inflammatory cytokines, oxidative stress, and DNA damage. These findings suggest that reduction of lipolysis leading to decreased serum FFAs has the potential to diminish the detrimental effects of e-cigarettes on the heart.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.02 - Cardiovascular and Cerebrovascular Diseases - RESEARCH ABSTRACT

Grant Support: This work was supported by the NIH grants: NIGMS (SC2GM135127), and the CDU Accelerating Excellence in Translational Science (AXIS) (U54MD007598-14S2)

DIFFERENTIAL PHOSPHORYLATION OF NOVEL JAK KINASE DOMAIN SITE

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Abstract

PURPOSE Hispanic children have the highest incidence of leukemia compared to other ethnic or racial groups in the U.S. Hence, it is vital to identify potential target sites for drug treatments, including sites where post-translational modifications occur in proteins related to leukemia. The dysregulation of Janus kinase/Signal transducer and activators of transcription (JAK/STAT) pathway can cause, among others, T-cell acute lymphoblastic leukemia (T-ALL) and the auto-phosphorylation of JAK1 and JAK3. METHODS The present study identifies the autophosphorylation of tyrosine 929 (Y929) within the JAK3 kinase domain from an in vitro kinase assay coupled to mass spectrometry analysis. Protein sequence alignment of JAK family members was performed to establish the conservation of Y929 among JAK proteins. The KIT225 cell line was used as a T-ALL model and assessed for phosphorylation of Y929 in JAK3 and the homologous JAK1-Y983 site by Western blot analysis using a phospho-specific antibody. Phospho-deletion studies were performed to investigate the functional role of Y929 on JAK3 signal transduction. RESULTS The site, and surrounding region, is conserved in human JAK1 and JAK3. JAK3-Y929 was found to be constitutively phosphorylated over a Interleukin-2 (IL-2) cytokine time course. In contrast, JAK1-Y983 phosphorylation was inducible by IL-2 stimulation. Phospho-deletion of JAK3-Y929 resulted in kinase inactivation as observed by decreased tyrosine phosphorylation of the kinase and downstream effector STAT5. DISCUSSION / CONCLUSION While constitutive phosphorylation of JAK3 Y929 was observed, JAK1 Y983 phosphorylation changed over time suggesting a differential role in controlling activation/deactivation of this JAK family member. Future analysis of these homologous tyrosine sites is necessary to determine their possible regulatory potential. Additional studies should be done to consider these sites as biomarkers or therapeutic targets for the treatment of T-ALL.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: This work was supported by a grant from the National Institute on Minority Health and Health Disparities, a component of the National Institutes of Health (5U54MD007592).

LOSS OF MITOCHONDRIAL FUS1 IMPAIRS NEUROBEHAVIORAL ACTIVITY

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Abstract

PURPOSE Mild cognitive impairment (MCI) occurs on a continuum from normal cognition to Alzheimer's disease/dementia, in a sex-dependent fashion. The underlying mechanisms driving the development of this form of cognitive impairment remain unclear. One crucial component of memory impairment is the dysregulation of mitochondrial calcium (miCa2+) in the brain. Disturbance of Ca2+ affects the homeostatic state of the neuroimmune system, including the health of microglia and neurons. Our group has found that Fus1 protein serves as a Ca2+ handling protein in cells. Fus1 protein is encoded by nuclear DNA, resides in mitochondria, and assists in Ca2+ uptake and extrusion via the Mitochondrial Calcium Uniporter (MCU) and mitochondrial Na-Ca2+ exchanger (mNCX), respectively. Fus1 deficiency results in Ca2+ dysregulation and increased oxidative stress. The goal of this study is to elucidate the role of Fus1 in the central nervous system (CNS). METHODS We examined the role of Fus1 in memory by using a systemic knockout (KO) of the gene in mice. Mice 4 months of age were subjected to behavioral tasks including Y-maze and OFT. We surveillanced the CNS environment to measure the impact of Fus1 loss on the levels of microglia activation in the brain via flow cytometry techniques. Finally, we measured MCU and Estrogen receptor alpha (ERα) protein levels via western blot analysis. RESULTS Fus1 deficiency impaired short-term spatial memory in males but not in females as assessed with Y-maze test ($p<0.05$). Fus1 KO females show an increased trend in locomotor activity as compared to KO males in OFT ($p<0.05$). Activation of microglia in the CNS was decreased in KO male mice. An increase was seen in MCU protein expression in Fus1 KO mice. DISCUSSION Overall, Fus1 may prove to be a crucial regulator in neurodegeneration and should be further explored in the context of age-related neurodegeneration.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.09 - Neuroscience and Mental Health - RESEARCH ABSTRACT

Grant Support: Tennessee Doctoral Scholars Program 33201-01622 (TSF), 5U54 MD007593 (AS), U54CA163069 (AS), SCI CA182843 (AS), SC1 CA182843-07S1 (AS)

PROSTATE CANCER KNOWLEDGE AND SCREENING AMONG BLACK MALES

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Abstract

PURPOSE: African American men (AAM) have the highest prostate cancer (PrCa) mortality rate of all racial/ethnic groups in the United States. Guidelines recommend that patients and their providers discuss prostate-specific antigen (PSA) screening tests after evaluating the patient's related medical conditions, beliefs, risks of PrCa, and risks and benefits of PSA screening. Understanding factors affecting AAM's knowledge of PrCa and experiences of PSA screening will ensure they can make truly informed PrCa screening decisions. METHODS: Prospective study of AAM patients (40-69 years old) receiving primary care services in two clinical sites (a private facility and a safety net facility) in the New Orleans area. As of August 2022, 137 participants completed a baseline assessment including demographic questions. RESULTS: Significant differences in participants' screening history were observed by clinical site ($p = 0.03$). A higher percentage of private facility participants (66%) self-reported PSA screenings than safety net (34%) participants. Intention-to-screen was significantly influenced by literacy level and age range ($p < 0.05$). Increases in literacy score and older ages were correlated with an increase in odds ratio for intent-to-receive a PSA exam. Participants who reported past PSA screenings scored significantly higher in confidence ($p=0.004$), efficacy ($p<0.001$), and all three knowledge scales ($p=0.021$, $p<0.0001$, $p=0.021$) compared to those without past reported exams. Family history of prostate cancer, higher educational attainment, and older ages were all significantly correlated with a higher knowledge of PrCa screening, diagnosis, and treatment ($p < 0.05$). DISCUSSION/CONCLUSION: Knowledge of PrCa and early detection are crucial to improving PrCa outcomes for AAM. Further research should explore key factors (literacy, education, family history of PrCa) affecting PrCa knowledge and access to PSA screening in different clinical settings.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: Research Centers in Minority Institutions Program (RCMI) of the National Institute on Minority Health and Health Disparities (NIMHD), Grant No. 2U54MD007595

CRKL ASSOCIATION WITH COMMON GAMMA CHAIN RECEPTORS

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Abstract

PURPOSE The Crk-like (CrkL) proto-oncogene adaptor protein is associated with many biological processes including cell proliferation and differentiation induced by multiple growth factors and tyrosine kinase-associated receptors. Our previous work linked CrkL with the Common Gamma Chain (γc) cytokine receptor for Interleukin-2 (IL-2) in human immune cells. CrkL has been reported to be tyrosine phosphorylated in response to IL-2 stimulation in T lymphocytes and natural killer cells. Moreover, CrkL is a known BCR-ABL tyrosine kinase substrate and is involved in Chronic Myelogenous Leukemia (CML) oncogenesis. CML is a form of leukemia, which disproportionately affects Hispanic Americans. Indeed, CrkL proteins are overexpressed in many forms of cancer and correlates with poor patient prognosis. This study sought to expand our knowledge of the association of CrkL within critical immune pathways by establishing a direct link with additional γc receptors and γc cytokine pathways. METHODS Co-Immunoprecipitation studies were performed to investigate the association between CrkL and γc within a reconstituted Hek293 system. Additionally, the human Kit225 T-cell line was stimulated with IL-4 and IL-9 and CrkL protein was analyzed by Western blot. RESULTS Here we show that tyrosine residues within the intracellular portion of γc differentially regulate association with CrkL. Moreover, IL-4 and IL-9 γc cytokines caused altered gel-mobility of CrkL, an indication of altered post-translational modification of the protein. DISCUSSION/CONCLUSION Similar results were reported previously for IL-2 suggesting a universal mechanism of γc cytokine receptor association with CrkL. A complete understanding of the role of CrkL in normal and cancer cells may provide valuable insights into novel therapeutic strategies for treating hematological malignancies driven by hyperactive tyrosine kinases.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

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SUBSTITUTED CHROMONE-2-CARBOXAMIDES AS ANTI-CANCER AGENTS

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Abstract

PURPOSE: Cancer is the second leading cause of death in the United States after heart disease. In 2023, the National Center for Health Statistics reported that there would be a total of 1.9 million new cancer cases, and 609,820 deaths from cancer are expected. Multidrug resistance (MDR) is one of the major challenges in cancer treatment and the development of new active compounds in drug discovery. A new class of compounds with a novel mechanism of action is believed to overcome these problems. Chromones have a benzo-γ-pyrone skeleton and display a large spectrum of pharmacological activities, such as anti-cancer, anti-HIV, antiviral, and anti-inflammatory, with low toxicity. In continuation of our current research work, we report the synthesis of substituted chromone-2-carboxamides by attaching tetrahydropyridine and tetrahydroisoquinoline groups as anti-breast cancer agents. METHOD: An equimolar amount of substituted chromone-2-carbonyl chloride was added to a stirred solution of corresponding substituted N-aminoisoquinolinium or N-amino pyridinium salts, followed by ylide formation, and reduction yielded the desired substituted chromone-2-carboxamides in moderate to good yields. These compounds were evaluated for their cytotoxic effects on MBA-MB-231 ER-ve breast cancer cell lines using a Synergy HTX multi-mode reader (Bio-Tek,

Winooski, VT, USA) with excitation/emission wavelength settings at 550/580. RESULTS: Among all the compounds screened, N-(3,4-dihydro isoquinoline-2-(1H)-yl)-6-methyl-4-oxo-4H-1-benzopyran-2-carboxamide showed the most potent cytotoxicity with an IC50 value of 0.82 µg/mL on the MDA-MB-231 cell line. CONCLUSION: Three substituted chromone-2-carboxamides were identified with potential antiproliferative activity. In silico pharmacophore hypotheses were generated using GALAHAD and PHASE. The best models with probable bioactive conformations(s) for these compounds were proposed to establish the safest and most effective analog.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

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DIET AND TYPE2 DIABETES RISK FACTORS AMONG AFRICAN AMERICAN COLLEGE STUDENTS

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Morgan State university (MA, EM, JO)

Abstract

PURPOSE: Diabetes is the seventh leading cause of death in America. In the past, type 2 diabetes (T2D) was considered a disease of middle and old age, but in recent decades we have had an increasing rate of T2D in youth, especially among African Americans. The hypothesis of this research was that there is a relationship between awareness of T2D, diet and risk of T2D among African American college students. The goal of this study was to assess T2D awareness, eating pattern, lifestyle, and their relationships with T2D risk factors among African American students at Morgan State University. METHODS: Two surveys containing awareness of T2D, general nutrition knowledge, healthy lifestyle and personal control, and food frequency were taken from 211 participants including 146 females and 65 males. Anthropometric data including body mass index (BMI), body composition, waist, and hip circumferences were obtained. Descriptive statistics were used to characterize the participants and Pearson's correlation was used to determine the relationships between T2D risk factors and the participants 'diet and awareness of T2D. The statistical package SPSS version 25.0 was used for statistical analyses. RESULTS: High body fat percentage and high waist circumference risk factors were %61.5 and %12.3 for male and %45.9 and %31.5 for females respectively, and %26 of all the participants were obese. Pearson's correlations revealed significant relationships between awareness of T2D and BMI ($r = 0.141$, P-value = 0.041). A significant relationship between men's diet and waist circumference was observed ($r = 0.0850$, P-value = 0.008). CONCLUSION: Having an unhealthy diet and unawareness of T2D can increase the risk of T2D, similar to the findings of previous studies among other ethnicities. Our findings reveal the importance of early detection of T2D risk factors and improving students' awareness about the seriousness of T2D and adherence to a healthy diet.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.03 - Diabetes, Obesity, and Metabolic Syndromes - RESEARCH ABSTRACT

Grant Support: UL1GM118973 and RL5GM118972

POTENTIAL ROLES OF BNIP3 MEDIATED PLACENTAL MITOPHAGY IN THE DEVELOPMENT OF GESTATIONAL DIABETES MELLITUS

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Abstract

To date, the root cause of gestational diabetes mellitus (GDM) remains unclear. A handful of studies found that mitochondrial defects occur in the GDM placenta, including excess accumulation of destroyed mitochondria, reduced ATP and enhanced ROS production, which indicates that mitophagy may be impaired in the GDM placenta. In this study, We hypothesized that placental mitophagy mediated by BNIP3 plays a critical role in the development of GDM. Four studies were conducted. 1) To investigate whether mitophagy is impaired in the GDM placenta,

we compared the protein abundance of mitophagy markers or major pathway mediators in mitochondrial factions of placental tissues collected from women with normal glucose tolerance (NGT) or GDM, followed by Western blotting analyses. 2) BNIP3 expression in human trophoblast cell line BeWo was knocked down, followed by Cell Mito Stress Test. 3) The expression of mitochondria-related genes in response to BNIP3 knockdown (BKD) was investigated by RNA sequencing. 4) We knocked out BNIP3 specifically in mouse trophoblast cells and conducted glucose tolerance test in pregnant mice with (cKO) or without (CT) gene knockout at late pregnancy. All numerical parameters between groups of patients, cells or mice were analyzed by ANOVA (n=4 or 3). The main findings include: 1) The protein abundance of mitophagy markers in GDM placentas was all reduced. 2) Mitochondrial ATP production was reduced in BKD cells. 3) The expression of mitochondria related genes TOMM6, MT-ATP6, NOL3 and IFI6, was reduced in BKD cells, while the expression of MCUB increased. 4) cKO mice demonstrated enhanced glucose intolerance. These results suggest that BNIP3 and BNIP3 mediated mitophagy pathway may play an important role in mitochondrial homeostasis in trophoblast cells, and the reduced BNIP3 expression in the placenta may lead to mitochondrial structural and functional defects, thus affecting placental functions and contributing to the development of GDM.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.03 - Diabetes, Obesity, and Metabolic Syndromes - RESEARCH ABSTRACT

Grant Support: NIH U54MD007597 Howard University RCMI-IDC Research Grant

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ANALYSIS OF CIRCULAR RNA LEVELS IN PROSTATE CANCER USING DATABASES

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Meharry Medical College

Abstract

PURPOSE: Prostate cancer (PCa) is one of the leading causes of cancer-related deaths in American men. In 2023, 34,700 deaths of PCa have been projected in the US with 288,300 new PCa cases. However, PCa malignancy strikes more on African American (AA) men than any other ethnic groups. The central hypothesis of this research is that the expression profile and levels of circular RNA (circRNAs) are significantly altered in PCa malignancy and PCa disparities. To investigate this, it's important to understand the forms and levels of circRNAs in PCa. Hence, the major goal of this research is to discover the forms and levels of circRNAs in PCa using circRNA databases. METHODS: We have explored different databases (CircAtlas, CircBase, CircNet, CircPedia, CircRic, CircRNADb, MiOncocirc and CircBank) to find the expression profile and levels of circRNAs in human cancers including PCa. RESULTS: We found the upregulation of circSMARCA5 gene and circHIPK3 gene in PCa using CircAtlas database and some information related to circKDM5B gene using CircRic database. DISCUSSION: The preliminary results show that various types and levels of circRNAs exist in PCa cells and tissues, and certain types of circRNAs may be elevated or decreased depending on their biological functions. GRANT SUPPORT: NIH U54 MD007586-35

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: NIH U54 MD007586-35

EXPLORATION OF THE MECHANISM OF CIRCRNA PROMOTING TRIPLE-NEGATIVE BREAST CANCER PROGRESSION BY MIRS

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Q Hao, Y Wu, and J Vadgama
Charles R. Drew University of Medicine and Science

Abstract

PURPOSE Breast cancer is the most common cancer diagnosed in women, accounting for more than 1 in 10 new cancer diagnoses each year. It is the second most common cause of death from cancer among women. The basal-like breast cancer (BLBC) lacks ER, PR, and HER2-related gene expression and shows a triple-negative phenotype (TNBC). Histologically, TNBC is usually a high grade with a high proliferation index. TNBC patients have a poor prognosis, and relapses may occur five years after diagnosis. Thus, there is an urgent need to

understand TNBC's molecular mechanisms better and identify novel therapeutic targets to improve clinical outcomes. METHODS We combined high-throughput screening of circRNA array and bioinformatics approaches functionally assessed the role of the circRNA in breast cancer cells. We performed Label-Free Cell Counting Kinetic Proliferation Assay, colony formation assay with crystal violet staining, and BrdU assay to confirm the regulation of cell proliferation by silencing circRAD54L2. An analysis with quantitative RT-PCR was performed to reveal the expression level of circRAD54L2 and miR-888s in human breast cancer samples and respective adjuvant normal tissue. RESULTS 1. CircRAD54L2 is upregulated in breast cancer cells. circRAD54L2 showed a higher expression in 4 breast cancer cell lines (MDA-MB-231, MDA-MB-468, MCF7, and T47D) than in non-tumor breast cell line MCF-12A. The RNase-R assay showed that circRAD54L2 was resistant to RNase-R and more stable than the linear mRNA of RAD54L2. 2. Silencing circRAD54L2 inhibits breast cancer cell migration and invasion. The migration and invasion capacity of MDA-MB-231 and MDA-MB-468 cells were remarkably weakened by circRAD54L2 knockdown. DISCUSSION Our studies have a broad impact on the field by providing a novel therapy target on circRNA in breast cancer patients or a new insight into the PDK1 pathway and also assist in the development of more effective therapeutic inhibitors for treating TNBC.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: This work was supported by NIH/NIMHD Accelerating Excellence in Translational Science Pilot Grants G0814C01 (Q. Hao); NIH/NIMHD Accelerating Excellence in Translational Science Research Project 2 Basic Grants G0814G00 (Y. Wu); NIH/NCI 1U54CA14393, NIH/NIMHD U54MD007598, Department of Defense Breast Cancer Research Program Grant BC043180, and NIH/NCATS CTSI UL1TR000124 (J.V. Vadgama).

A CASE AND CONTROL GENETIC PROFILE OF TISSUE AND SERUM IN AFRICAN AMERICAN MEN

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Abstract

PURPOSE Prostate cancer is the most common non-cutaneous cancer among men. A man with 1,2 or 3 first degree relatives with prostate cancer, has a 2,5, and 11-fold increased risk of developing prostate cancer. The heritability rate of prostate cancer is 58%. African American men have the highest incidence and mortality rate of prostate cancer in American. Men of African descent, globally, are more likely to die from prostate cancer than any other ancestral groups. We hypothesize that RNA sequencing analysis of prostate tissue from men with metastasis will reveal HMGA2 induced RNA amplification or regulatory cues that are discerned from global changes in the RNA levels. HMGA2 has been shown to promote EMT, invasion, and metastasis in cancer. METHODS Total RNA was isolated from frozen African American samples of 3 benign and 2 metastatic prostate cancer tumors and serum. Immunohistochemistry was performed to validate differential candidate gene expression. RESULTS IHC markers showed HMGA2 staining within epithelial cells of the prostate cancer tissue. This result validates studies that show that distinct subtypes of prostate cancer may arise from luminal and basal epithelial cell types. RNA seq results showed HMGA to be non-significantly downregulated in tumor samples. The most differentially expressed (DE) gene, however, was SNORD116-18. RNA seq of serum gave homogeneous results, even so, gene set enrichment analysis of the most differentially expressed genes within the serum showed overlap with inflammation pathways gene for upregulated DE genes and Methylation Pathway for downregulated DE genes. DISCUSSION Studies have shown SNORD116-18 expression to be associated with chronic lymphocytic leukemia in distinguishing prognostic groups. This finding may be a pathway of interest for further studies. Furthermore, analysis on more African American samples and serum would be impactful in validating our findings.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: These studies were supported by NIH/NIMHD U54MD007

CANNABINOID RECEPTOR SIGNALING IN CENTRAL OLFACTORY NEURONS

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Howard University College of Medicine (TH, ZJW)

Abstract

PURPOSE: The endocannabinoid (eCB) signaling system functions in many brain regions but our understanding of the role of cannabinoid receptor type 1 (CB1R) in olfactory processing remains limited. eCBs mediate retrograde signaling at synapses in several brain regions through a form of short-term neural plasticity. eCBs are released from depolarized principal neurons and rapidly diffuse to presynaptic inhibitory interneurons to transiently reduce presynaptic firing and neurotransmitter (GABA) release. METHODS: We study the function of the eCB system in regulating neural activity at synapses in the main olfactory bulb, the first central relay station in the brain for the processing of olfactory information. Our experimental approach uses electrophysiological recording techniques, specifically whole cell patch-clamp recordings. RESULTS: Previously, we showed that CB1R is present in periglomerular processes of a GAD65-positive population of interneurons but not in mitral cells, key output neurons. We detected eCBs in the mouse main olfactory bulb as well as the expression of CB1R and other genes associated with the cannabinoid signaling system. Mitral cells and tufted cells in the olfactory bulb are computational elements in brain circuits that integrate incoming signals with membrane properties to generate behaviorally relevant synaptic output. Our data show that cannabinoid mediated retrograde signaling is present in neural circuits involving mitral and tufted cells. These cells release eCBs and, through retrograde signaling, inhibit presynaptic interneurons such as periglomerular cells and GABA release of these presynaptic neurons. This, in turn, allows mitral and tufted cells to temporarily regulate their synaptic input and relieve them from synaptic inhibition. CONCLUSIONS: eCBs function as retrograde messengers to regulate neural signaling and mediate plasticity at olfactory bulb synapses with potential effects on olfactory threshold and behavior.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.09 - Neuroscience and Mental Health - RESEARCH ABSTRACT

Grant Support: This publication resulted in part from research support to T.H. from NSF (IOS-1355034), NIH (P30AI117970), and Howard University College of Medicine.

MORPHOLOGICAL DISTRIBUTION OF MICROGLIA IN WHOLE RAT BRAIN AFTER GLOBAL ISCHEMIA

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Abstract

INTRODUCTION Microglia are crucial immune cells in the central nervous system, playing a significant role in brain injuries and diseases. Machine learning models were utilized to analyze immunohistochemistry (IHC) images of normal and cardiac arrest rat brain tissues in order to investigate how hypoxia-ischemia alters the activation of microglia throughout the brain during neuroinflammation. METHOD Long Evans rats were subjected to 12-minute asphyxia cardiac arrest and were sacrificed 24 hours after resuscitation. Brain sections were obtained at a thickness of 40 µm, and microglia IHC images were acquired using 20X bright field microscopy after staining with anti-Iba1 antibody. Microglial morphology was quantified using machine learning through a three-step process involving cell detection with YOLOv5, segmentation with U-Net, and classification with C5.0 into six categories (ramified, hypertrophic, bushy, amoeboid, rod, and hyper-rod cells), based on manual label ground truth. RESULTS The proposed machine learning system was able to classify microglia morphology in good agreement (~79% in dice index) with manual ground truth. The analyzed images were presented with colored bounding boxes indicating cell types. Overall, the density of microglia was 662 cells per mm2 in the normal brain, and 875 cells per mm2 in the hypoxic brain. In the ischemic brain, the ramified microglia were more likely to transform into bushy and amoeboid forms. Compared to the normal brain, the densities of the bushy and amoeboid microglia increased in the hypoxic brain approximately 4.2 and 3.7 times, respectively. CONCLUSION The study demonstrates the ability of machine learning to analyze the distribution of activated microglia that indicates regional inflammation in the brain. The proposed machine learning system may yield a high throughput quantification of a large number of microglia without human bias.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.09 - Neuroscience and Mental Health6.01 - Artificial Intelligence - RESEARCH ABSTRACT

Grant Support: This study was supported by NIH grants of NIMHD U54MD007597, NINDS R01NS112294, R01NS123442, NICHD P50HD105328, and NSF grants of HRD 2200489 and CNS 2200585.

IDENTIFY ACE1 ACTIVE SITE'S CONSERVED WATER FOR DRUG DESIGN

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Abstract

PURPOSE: Cardiovascular diseases (CVDs) remain the major leading cause of human deaths in the 21st century. Successful drug design targeting the CVD-related proteins contributes to the prevention and cure of CVDs. Conserved and stable water(s) in the active site of CVD-related proteins can be incorporated into the construction of a pharmacophore model for drug design purpose in order to cure CVDs. METHODS: 100-ns Molecular Dynamics (MD) simulation have been performed on ACE1 (Angiotensin-Converting Enzyme I, a CVD-related protein) with both PDB ID 1o86 and 1o8a structures respectively in order to identify the conserved water sites around the active site of ACE1, and cluster analysis of water positions (after structures superimposed) has been conducted to identify the water cluster sites. The conservation of water positions in each of the selected cluster sites is evaluated. RESULTS: Among the water cluster sites selected (with 4 Å cutoff on cluster diameter) after cluster analysis, most clusters had random waters moving in and out; two clusters had few and conserved water molecules visiting and staying much longer of the time there and these two hydration sites were integrated with several sites (from ligand Lisinopril) to be a dynamic pharmacophore used for screening for potential drug candidates via ZINCPharmer. DISCUSSION / CONCLUSION: Two potential potent drug candidates for ACE1 was obtained (via ZINCPharmer) by incorporating the oxygen (O) atom (in two conserved hydration sites) to the inhibitor backbone in the ACE1 active site (for a pharmacophore); the ADMET and "binding affinity to ACE1" of these two compounds were in the process of evaluations by ADMETlab and PyRx programs. Structure-based drug design like this can be applied to devise a potent drug targeting CVDs. KEYWORDS & TERMS: CVD, ACE1, Molecular Dynamics, Structural Superimposition, Cluster Analysis, Water Hydration Site, Pharmacophore Model, In Silico Drug Design

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.02 - Cardiovascular and Cerebrovascular Diseases - RESEARCH ABSTRACT

Grant Support: GRANT SUPPORT: This research was supported by a Pilot Project grant awarded to Dr. HC HUANG by the National Institutes of Health/National Institute on Minority Health and Health Disparities Grant # 1U54MD015929-01, through the RCMI Center for Health Disparities Research at Jackson State University (Director: Dr. PB Tchounwou).

INHIBITORY EFFECT OF SMR PEPTIDES ON STAPHYLOCOCCUS AUREUS BIOFILM FORMATION

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Abstract

Objective: The aim is to identify a therapeutic strategy for preventing and/or disrupting biofilm formation in S. aureus. Investigating the efficacy of the Secretion Modification Region (SMR) peptide in blocking S. aureus biofilm-forming capacity will provide a novel approach to treating these life-threatening infections. This research is particularly important since it can potentially reduce mortality, treatment failure, and crude mortality due to antibiotic resistance-induced delays in empirical therapy. Methods: In this study, we evaluated the efficacy of the SMR peptide in blocking antibiotic-resistant S. aureus biofilm-forming capacity. Strains were treated with SMR peptide and were screened for their biofilm-forming capacity using microtiter plate (MtP) methods and Confocal Microscope. The Co-IP determined the interaction between the antagonist and DnaK with anti-Flag M2 Affinity and Western blot analysis. Results: The experiment results are presented as a graph showing the optical density of the Crystal Violet-stained biofilm at different concentrations of the SMR peptide. The results showed that the SMR peptide inhibition rate of biofilm formation of S. aureus is 24.61% (18 µM), 61.24% (36 µM), and 80.32% (72 µM), respectively. The above results showed positive results using MtP, and no biofilm or significant inhibition was observed with the SMRmut peptide as the negative control. Conclusions: The SMR peptide is a 5-mer peptide with a sequence of 66Val-Gly-Phe-Pro-Val70. That can bind to the surface of

bacteria, preventing them from forming biofilms. Studies have shown that the SMR peptide can effectively inhibit biofilm formation in S. aureus. Furthermore, it can reduce the number of viable bacterial cells in biofilm-producing strains, increasing susceptibility to antimicrobial agents. This study's results will help determine the efficacy of the SMR peptide in blocking antibiotic-resistant S. aureus biofilm-forming capacity. It could be used as a potential treatment

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.07 - Microbiome - RESEARCH ABSTRACT

Grant Support: This research and the facilities used for the research were supported by the following grants: NIH/NIMHD 8G12MD007602; NIH/NIMHD 8U54MD007588; NIH/NIMHD/RCMI 2U54MD007602-31A1; NIH/RCMI U54 Pilot.

USING PROTEOLYSIS TARGETING CHIMERAS FOR THERAPEUTIC DEGRADATION

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Abstract

PURPOSE: Proteolysis Targeting Chimeras (PROTACs) are heterobifunctional molecules that contain a domain that interacts with a target protein and a domain that recruits an E3 ubiquitin ligase coupled by a flexible linker. The resulting complex causes ubiquitylation of the target protein and its subsequent degradation by the proteasome. This PROTAC-dependent protein degradation strategy is an effective therapeutic in pathologies that involve proteins that have generated novel functions (e.g. oncogenic kinases, protein aggregates). METHODS: We have developed a series of PROTACs that target tau aggregates that form in Alzheimer's Disease and the constitutively active ALK protein found in non-small cell lung cancer. While each compound uses a common motif that recruits the ubiquitous E3 ubiquitin ligase Cereblon, we have altered both the linker and the targeting domain to increase selectivity and activity for the target protein. PROTACs targeting tau degradation are tested in a FRET-based cellular assay of tau aggregation, while PROTACs targeting ALK are tested in the Ba/F3 cell model expressing oncogenic forms of ALK. RESULTS: While PROTACs induce the ubiquitylation of tau in cellular studies of tau aggregation, we do not see a significant decrease in either tau aggregates or total tau protein, suggesting that tau aggregates are too stable to be degraded by the proteasomal pathway. In Ba/F3 cells expressing oncogenic ALK, we see a dose-dependent decrease in total ALK protein level, with IC50 values in the single nanomolar range. At this concentration, we also see a significant effect in cell proliferation studies, suggesting an effective reduction in ALK-dependent proliferative signaling. CONCLUSION: We have designed and synthesized a novel series of heterobifunctional PROTAC molecules that have therapeutic potential in blocking ALK-positive non-small cell lung cancer. Future studies will test their efficacy on human suppressor mutations that escape currently approve

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: 3U54MD007595-13S2

DEVELOPMENT OF THERAPEUTICS TARGETING TAUOPATHY FOR ALZHEIMER'S DISEASE

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Abstract

PURPOSE: Alzheimer's Disease (AD) afflicts over 6 million Americans, with African Americans being twice as likely as non-Hispanic whites to develop AD. In AD patients, there is a direct correlation between cognitive decline and the formation of intraneuronal neurofibrillary tangles (NFTs), which are aggregates of a hyperphosphorylated form of the microtubule-associated protein tau. Of particular interest to this project is the finding that casein kinase 1 delta (CK1D) is upregulated 30x in AD brains and phosphorylates tau. Thus, we have designed and tested novel inhibitors of CK1D as potential therapeutics for AD. METHODS: Using computational docking studies, our laboratory has identified the structural features on napthoquinolones that selectively inhibit CK1D in kinase arrays and are further optimizing them for potency. We are testing these inhibitors for their abilities to decrease tau phosphorylation in a reconstituted in vitro kinase assay

using purified components, as well as in the SH-SY5Y neuroblastoma cell line. RESULTS: We have generated 28 derivatives of 5,8-dihydroxy-1,4-napthoquinone and 5,7-dihydroxy-1H-inden-1-one. SH-SY5Y cells were incubated with these compounds in culture for 24 hours, then lysed and processed for Western blots using antibodies specific for tau phosphorylated at S202 and S396. Band densitometry was performed and normalized to total tau and the results were compared to control-treated cells. Similarly, using recombinantly expressed and purified human CK1D and tau, we performed in vitro kinase assays in the presence and absence of our novel inhibitors and processed the resulting samples for Western blots as for cellular assays. We found a significant decrease in tau phosphorylation at S202 and S396 in the presence of several of our novel inhibitors in both assays. DISCUSSION/CONCLUSION We have synthesized novel compounds that block CK1D-dependent phosphorylation of tau, a predisposing event in the formation of NFTs. Future studies w

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.09 - Neuroscience and Mental Health - RESEARCH ABSTRACT

Grant Support: 3U54MD007595-12S2

TRENDS IN INCIDENCE OF COLON CANCER IN WASHINGTON, DC: A RETROSPECTIVE INSTITUTIONAL COHORT STUDY

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Abstract

Colorectal cancer (CRC) is the third leading cause of cancer death in the United States. Reducing the number of deaths from cancer depends on early detection through preventative screening. The reasons for cancer-related health disparities are multifactorial and encompass physician as well as patient barriers. Physician factors include lack of knowledge of CRC screening guidelines along with disparate recommendations for screening. Patient factors that contribute to disparities include poor knowledge of benefits of cancer screening, limited access to health care, and health insurance status as well as fear and anxiety. To reduce the spread of COVID-19, medical institutions were urged to delay nonurgent medical procedures and surgeries. Thus, the pandemic's impact on colorectal cancer prevention and control measures remains largely unknown. Objective: To examine local trends in colon cancer incidence by demographic characteristics and to compare cancer incidence and prevalence rates among racial and ethnic groups. Setting: An urban health care facility in the District of Columbia. Primary data outcomes: 1) histopathologic colon cancer diagnoses, 2) primary colon site, and 3) cancer staging information as an indicator of health disparities We will conduct regression analyses and control for demographic variables associated with colon cancer diagnosis, colon site, and cancer staging. Covariates included race, age, sex, educational attainment, marital status, insurance, household income, cancer history/family history, screening modality, educational attainment. A retrospective chart review was conducted to examine the impact of COVID19 on colorectal cancer health disparities among African Americans in the District of Columbia. This study aims to shed light on the incidence of colon cancer in minority populations with implications to help target future interventions to address health communication for individuals with early-onset colon cancer.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: RCMI-IDC Howard University, Howard University College of Medicine Bridge Funding

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INTERACTIONS BETWEEN CANCER CELLS AND NEURONAL CELLS IN CANCER METASTASIS.

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Abstract

ABSTRACT Prostate cancer (PCa) and breast cancer (BCa) mortality is due to bone metastatic disease. Neurite outgrowth is a fundamental process in the differentiation of neurons which can contribute to cancer-nerve interactions to fuel aggressive cancer. Snail is an important gene which regulates the epithelial-mesenchymal transition (EMT), a process by which tumor cells at the invasive front undergo this transition to promote invasion, migration, and subsequent metastasis. PURPOSE We hypothesize that Snail expression in PCa cells can stimulate neurite outgrowth in nerve cells through secretion of extracellular vesicles (exosome or microvesicles). METHODS We first collected culture media and isolate exosomes from PCa cells with Snail knockdown or BCA cells with Snail overexpression. Success of exosome isolation was confirmed by western blot with exosomal markers and Transmission Electron Microscope (TEM). We also performed neurite outgrowth assay with conditioned medium collected from PCa and BCa cells expressing different levels of Snail protein added to PC-12 neuronal cells. RESULTS Higher levels of neurite outgrowth were observed in PC-12 cells cultured with conditioned medium collected from cancer cells that express high levels of Snail. DISCUSSION / CONCLUSION We will test whether exosomes from the cancer cells can promote neurite outgrowth. Studying cancer-nerve interactions may lead to novel therapeutic targets for aggressive disease.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

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THE DESIGN AND DEVELOPMENT OF GMC1 ANALOGUES: TARGETING THE REGULATION OF HORMONAL RECEPTORS IN PROSTATE CANCER CELLS.

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Abstract

PURPOSE An effective way of treating prostate cancer (PC) is androgen deprivation therapy (ADT). Earlier research reported GMC1 effectively inhibit androgen receptor (AR) and glucocorticoid receptor (GR) activities in a variety of PC lines. However, poor solubility of GMC1 in water and lipid has made it desirable and necessary to design and develop new pharmacophores/analogues with suitable water solubility, liquid stability, and therapeutically potent against PC. METHODS This study is aimed at designing and developing new analogues of GMC1, and this study employed both computational and in vitro methods to identified compounds with inhibitory potentials against CRPC related proteins and PC cells. SWISS-similarity and Zinc databases were utilized for screening of compounds to identify GMC1-structurally related compounds with better physicochemical properties. In vitro inhibitory activity against MDA cells was done using luciferase induction assay. RESULT AND EXPECTATIONS A search of the databases identified over 7000 analogues of GMC1. Out of the over 7000 GMC1 analogues, 231 were predicted to show better solubility in lipid and water than GMC1. And the results of the molecular docking analysis revealed 27 compounds exhibited higher docking scores toward the FK1 domain of FKBP52 protein compared to the reference drug, FK506 and GMC1. For the AR and GR, 35 and 40 analogues respectively exhibited higher docking scores towards their ligand binding domain (LBD) than the reference drugs and GMC1. A further molecular dynamic simulations study of the best docked compounds showed 8, 4 and 7 compounds showed better binding affinities and stable conformation at the binding sites of GR, FKBP52 and AR, respectively. DISCUSSION AND CONCLUSION against AR and GR revealed two compounds, RJ3 and RJ11 showed 45 and 90 % inhibition, respectively. However, toxicity assay showed the two compounds lowers reporter's expression.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: This project is sponsored by CPRIT Grant No: RP210043

INHIBITORY MECHANISM OF OJT009 AND OJT0010 AS POTENT BLOCKERS OF MOLECULAR INTERACTION BETWEEN SARS-COV-2 SPIKE PROTEIN AND HUMAN ANGIOTENSIN-CONVERTING ENZYME-2

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Abstract

PURPOSE Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infects the host through interaction of its spike protein (S(RBD)) with human angiotensin-converting enzyme 2 (rhACE-2). Thus, disruption of this molecular interaction will lead to reduction in viral infectivity. METHODS This study aimed to analyze the inhibitory potentials of two mucolytic drugs; OJT009 and OJT0010, to serve as potent blockers of these interactions and alters the binding affinity between the proteins employing in vitro and computational techniques. RESULT AND EXPECTATIONS The in vitro data showed OJT0010 displayed the highest inhibition of S(RBD)-rhACE2 protein interaction at lower micromolar concentrations (100nM to 10µM); compared to higher concentrations of OJT009 from 50 µM. Interestingly, we found that OJT009 inhibited the binding of S(RBD) protein to rhACE2 receptor at lower concentrations (100 nM to 10 µM). Computational data revealed that the binding of the two drugs at the S(RBD)-rhACE-2 site does not alter the binding affinity and interaction between the proteins. However, the binding of OJT0010 (-56.931 Kcal/mol) and OJT009 (-46.354 Kcal/mol) at the exopeptidase site of rhACE-2, significantly reduced the binding affinities between the proteins compared to the unbound, S(RBD)-rhACE2 complex (-64.856 Kcal/mol). The result further showed the two drugs have good affinity at the hACE-2 site, inferring they might be potent inhibitors of rhACE-2. DISCUSSION AND CONCLUSION Residue interaction networks analysis further revealed the binding of the drugs resulted in loss of interactions between the proteins. This study suggests the binding of the two drugs at the exopeptidase site reduces the binding affinity of the proteins, and consequently might inhibit viral entry.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.06 - Infectious and Immunological Diseases (non-HIV) - RESEARCH ABSTRACT

Grant Support: This project is sponsored by NIH-RCMI (U54MD007605) Grant.

A CONCEPTUAL FRAMEWORK OF TYPE II DIABETES MELLITUS AND ALZHEIMER'S DISEASE IN AFRICAN AMERICANS

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Abstract

Chronic Type II Diabetes Mellitus (T2DM) has become a serious health concern in the US and is gaining prevalence globally. T2DM is a metabolic syndrome characterized by insulin resistance and pancreatic beta-cell dysfunction. Both environmental and genetic factors have contributed to the significant increase in the risk of developing T2DM among marginalized populations. African Americans (AA) are affected at a disproportionate rate for T2DM compared to other ethnic groups. Our understanding of how the disease affects vulnerable populations is hindered due to a lack of empirical evidence (reported incidences) regarding its relation to metabolic syndrome. Our earlier findings have indicated that T2DM to an increased risk of developing Alzheimer's Disease (AD) by identifying signature genes with overlapping genetic pathways, e.g., neuroinflammation, beta-amyloid deposition, and mitochondrial dysfunction with significant signs of cognitive impairments associated with AD. In continuation with our previous study, we investigated the β-amyloid precursor protein (APP) pathways and cholesterol biosynthesis-related genes using qRT-PCR based profiler array. The pathophysiology of the two diseases was assessed and validated for each T2DM participant using Ingenuity Pathway Analysis (IPA). We identified Amyloid Processing, Neuroinflammation Signaling, ERB4 Signaling, Interleukin signaling, and nNos signaling as the top canonical pathways. The top diseases and their functions depicted from our results were Metabolic disease, Neurological disease, Organismal Injury and Abnormalities, Psychological disorders, and cardiovascular diseases. APP, IL18, PSENEN, and MAPK are the signature molecules (key genes) that are differentially expressed in APP pathways. The results suggests that controlling T2DM may be crucial in reducing the risk of developing AD in chronic diabetic AA patients. Further studies with other ethnic groups would be of interest to better understand AD pathogenesis.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.03 - Diabetes, Obesity, and Metabolic Syndromes - RESEARCH ABSTRACT

Grant Support: NIH NINHD

UP284, A SMALL MOLECULE INHIBITOR OF ADRM1 DEMONSTRATES SIGNIFICANT ANTI-TUMOR EFFICACY IN PRECLINICAL MODELS OF AGGRESSIVE BREAST CANCER

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Abstract

Quadruple-negative breast cancer (QNBCs) is a highly aggressive and metastatic disease and remains clinically challenging breast cancer subtype with worst prognosis. Due to its exceeding heterogeneity, absence of the AR, ER, PR, Her2 receptors and lack of established therapeutic targets, QNBC is hard to treat cancer and recurs rapidly with standard chemo regimen. QNBC demonstrated vulnerability to proteasome inhibition due to their higher metabolic needs. But FDA approved 20S proteasome inhibitors failed to treat solid tumors including QNBC. Hence, developing an effective strategy to overcome the limitations associated with current 20S proteasome inhibitors is mandated to provide alternate treatment options for QNBC patients. Preclinical, Up Therapeutics lead candidate small molecule inhibitor Up284 has shown significant tumor growth inhibition as a single agent in animal models. To explore potential synergy of Up284 with other therapeutic agents, we conducted the in vivo combination experiments. In this work, we present ADRM1 amplification in QNBC tumors, identification of a small molecule selective inhibitor of ADRM1, Up284 (Up Therapeutics), Up284 demonstrated efficacy against panel of BC cell lines and patient derived organoids. In vivo combination results for Up284 with widely used BC standard-of care chemotherapy regimen demonstrated strong in vivo synergy in tumor mouse syngeneic models. Taken together, these data demonstrated combination synergy of a small molecule ADRM1 inhibitor with other agents. These results pave the road for potential clinical evaluation of combination treatment of QNBC in patients.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: NIH/NIMHD RCMI U54 MD007585-26

COMPARATIVE AND INTEGRATIVE ANALYSIS OF TRANSCRIPTOMIC AND EPIGENOMIC-WIDE DNA METHYLATION CHANGES IN AFRICAN AMERICAN PROSTATE CANCER

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Abstract

African American (AA) men have the highest incidence and mortality rate from Prostate cancer (PCa) than any other racial/ethnic group. To date, PCa genomic studies have largely under-represented tumor samples from AA men. We measured genome-wide DNA methylation in 113 prostate tissue biospecimen from AA men using the Illumina Infunium 850K EPIC array. mRNA expression database from a sub-set of the AA biospecimen were used to assess correlation of transcriptome and methylation datasets. Genome-wide methylation analysis identified 11460 probes that were significant ($p<0.01$) and differentially methylated in AA PCa compared to normal prostate tissues and showed significant ($p<0.01$) inverse-correlation with mRNA expression. Ingenuity pathway analysis and Gene Ontology analysis in our AA dataset compared with TCGA dataset showed similarities in methylation patterns: top candidate genes with significant hypermethylation and corresponding down-regulated gene expression were associated with biological pathways in hemidesmosome assembly, mammary gland development, epidermis development, hormone biosynthesis and cell communication. In addition, top candidate genes with significant hypomethylation and corresponding up-regulated gene expression were associated with biological pathways in macrophage differentiation, cAMP-dependent protein kinase activity, protein destabilization, transcription co-repression and fatty acid biosynthesis. In contrast,

differences in genome-wide methylation in our AA dataset compared with TCGA dataset were enriched for genes in steroid signaling, immune signaling, chromatin structure remodeling and RNA processing. Overall, differential methylation of AMIGO3, IER3, UPB1, GRM7, TFAP2C, TOX2, PLSCR2, ZNF292, ESR2, MIXL1, BOLL and FGF6 were significant and uniquely associated with PCa progression in our AA cohort.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: NIHMD/NIH 2U54MD007597

CTNI PHOSPHORYLATION PROTECTS HEART IN ISCHEMIA/REPERFUSION

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Abstract

PURPOSE Minority populations experience much higher risks, morbidity, and mortality of ischemic heart diseases. Age is a risk factor for ischemic heart disease. Phosphorylation of cardiac troponin I (cTnI), an essential sarcomeric protein, plays a vital role in regulating heart function. The site-specific phosphorylation on cTnI Ser199 is upregulated in human ischemic heart failure. Our previous study revealed its cardiac protective effect against ischemia/reperfusion (I/R) in young male mice. The present study tested whether such a protective effect exists in old mice of both sexes and investigated the underlying mechanism. METHODS We generated a transgenic mouse model (TgD) carrying Serine to Aspartic Acid mutation at cTnI Ser200 (equivalent to Ser199 in human) to mimic the site-specific hyperphosphorylation, which was a widely accepted method. Cardiac function was examined using Langendorff isolated hearts at baseline and after 30-minute global ischemia followed by 2-hour reperfusion. RESULTS At baseline, TgD hearts (6-8 mice/gender, age 19-24 months) showed comparable rate pressure product (RPP), left ventricular developed pressure (LVDevP), and dP/dtmax but slightly decreased dP/dtmin relative to wildtype (WT). After I/R, TgD presented significantly better RPP, LVDevP, dP/dtmax, and dP/dtmin with a remarkable contractile function recovery rate compared to WT ($P<0.05$) in both sexes. Total ROS level was similar in TgD and WT hearts at baseline. Although ROS increased after I/R, it remained significantly lower in post-I/R TgD than WT hearts, associated with differentially altered activities of antioxidant enzymes. CONCLUSION In conclusion, human heart-failure-related cTnI Ser199 hyperphosphorylation protects heart function during global I/R in isolated mouse hearts of both genders in both young and old age groups with a mechanism involving ROS downregulation.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.02 - Cardiovascular and Cerebrovascular Diseases - RESEARCH ABSTRACT

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A NOVEL ROLE OF NUDT5 (NUDIX HYDROLASE 5) IN THERAPEUTIC-RESISTANT PROSTATE CANCER

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Abstract

PURPOSE: In the United States, prostate cancer (PCa) is one of the most common types of cancer in men and disproportionately affects African Americans. Many PCa patients respond well to first-line chemotherapy (docetaxel) or androgen-deprivation therapy (ADT, such as enzalutamide and abiraterone). However, many patients relapse and demonstrate resistance to these PCa therapies. These resistances are a major obstacle in the clinical management of PCa. It is urgent to discover the mechanism of resistance in PCa patients and develop diagnostic tools like biomarkers and drugs to diagnose and treat patients that are becoming chemo or anti-hormone resistant. NUDT5, an enzyme, has been linked to key processes in nucleotide metabolism and cancer. In this study, we aimed to unveil the role of NUDT5 in therapeutic resistance of PCa. METHODS: We determined NUDT5 expression in prostate cancer cell lines C4-2B (androgen-independent), C4-2B TaxR

(docetaxel-resistant), C4-2B MDVR (enzalutamide-resistant) and C4-2B AbiR (abiraterone-resistant) compared with normal/benign prostate epithelial cells BPH1 using Western blot analysis. We also conducted proteomic analysis in C4-2B, C4-2B TaxR, C4-2B MDVR and C4-2B AbiR cells. Each sample was harvested in triplicate and results analyzed using Perseus. RESULTS: 1. Proteomic analysis found that NUDT5 was upregulated significantly in the docetaxel-resistant and ADT-resistant cell lines. NUDT5 was particularly expressed at a higher level in C4-2B-MDVR. 2. Western blot analysis in BPH1 and C4-2B, C4-2B TaxR, C4-2B AbiR and C4-2B MDVR found that NUDT5 expression was upregulated in the three resistant cell lines compared with BPH1 and C4-2B cells, with the highest expression in C4-2B MDVR. CONCLUSION: The studies suggested that NUDT5 might play a key role in PCa progression toward drug resistance. Overexpression of NUDT5 may promote PCa progression and could be explored as a new biomarker and therapeutic target to overcome therapeutic resistance.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: GRANT SUPPORT: National Cancer Institute 1R01CA256058-01A1 and 2R42CA217491-02A1, National Institute on Minority Health and Health Disparities Research Center in Minority Institute 5U54MD007590, Department of Education Title III program (Wu).

THE HYPER-ACTIVATED KDM5B/SOX9 SIGNALING IS ASSOCIATED WITH NEUROENDOCRINE PROSTATE CANCER PROGRESSION

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Abstract

Prostate cancer (PCa) disproportionally strikes African American men more than other ethnic groups. Neuroendocrine PCa (NEPC) is a lethal subset of PCa. The treatment strategy against NEPC is not yet established. Therefore, it is necessary to understand the molecular mechanism of NEPC. Lysine (K)-specific demethylase 5B (KDM5B) is frequently elevated in NEPC. Sex-determining region Y [SRY]-box transcription factor 9 (SOX9) has been suggested to drive prostate carcinogenesis. Here, we investigated the functional role of KDM5B/SOX9 signaling in NEPC differentiation. Initially, the elevation of KDM5B and SOX9 levels was verified in human NEPC specimens and NEPC cell lines. Strikingly, KDM5B ablation decreased the levels of SOX9 and neuroendocrine (NE) markers (Enolase 2 and Synaptophysin) in PC3 cells. By contrast, KDM5B add-back in KDM5B knockout (KO) cells restored the levels of SOX9 and NE markers. More importantly, NE differentiation was only detected in recurrent tumors of castrated Pten/Trp53 mice with higher Kdm5b and Sox9 levels as compared with regressive tumors, suggesting that KDM5B/SOX9 upregulation was associated with NEPC malignancy in mouse models. Mechanistically, KDM5B governs SOX9 signaling in PCa by directly binding the SOX9 promoter. KDM5B KO resulted in a reduction of SOX9 and consequently deferred the NE differentiation. Furthermore, SOX9 signaling was hyper-activated in LNCaP-MDV cells, which were generated by treating LNCaP cells with MDV3100. Interestingly, LNCaP-MDV cells with hyper-activated SOX9 signaling displayed strong NE characteristics compared with parent LNCaP cells. We generated SOX9 KO PCa cells using CRISPR/Cas9 technology. As expected, SOX9 KO decreased the levels of NE markers and SOX9 add-back restored the levels of NE markers. These findings reveal that KDM5B/SOX9 acts as a key effector on the progression of NEPC malignancy, and support that targeting KDM5B/SOX9 can be a novel and effective therapeutic strategy for controlling PCa.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: MD007586, CA163069 and ACS DICRIDG-21-071

THE MECHANISM OF CELLULAR APOBEC3G AGAINST HUMAN IMMUNODEFICIENCY VIRUS TYPE-1 INFECTION

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Abstract

The human apolipoprotein B mRNA-editing enzyme, catalytic polypeptide-like 3G (APOBEC3G, A3G), is a host restriction factor that plays a vital role in antiviral innate immunity. It restricts human immunodeficiency virus type-1 (HIV-1) replication due to its antiviral effects by inducing lethal G to A hypermutations in the viral genome and inhibition of reverse transcriptase. Evidence supports the idea that A3G is packaged into HIV-1 virions and introduced to the target cell before exerting its antiviral effects. In this study, however, we are revealing a novel mechanism that cellular A3G immediately takes antiviral effect during early HIV-1 infection. Human A3G knockout T-cells (A3G-KO), were used to investigate the effects of cellular A3G during initial infection. Enveloped deficient pseudo-HIV was employed to ensure one-round infection. Lentiviral particles expressing A3G were transfected in the A3G-KO cell line to restore endogenous expression. Preliminary data showed that the A3G-KO cell line was more susceptible to HIV-1 infection than that of its WT counterpart in a viral replication system suggesting that cellular A3G plays a role in inhibiting HIV early replication. To confirm the novel function of A3G, we transfected A3G expressing construct into the A3G-KO cell line, which will be used in a trans complementation assay. We are the first to show that cellular A3G immediately restricts HIV infection. This study will lay a foundation for revealing a novel antiviral mechanism of A3G and shed light on future HIV gene therapy studies.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.05 - HIV and AIDS - RESEARCH ABSTRACT

Grant Support: This study is sponsored by the Tennessee Center for AIDS Research (TN-CFAR) (P30AI110527), RCMI Program in Health Disparities Research at Meharry Medical College (U54MD007586) and by the NIH grant NHLBI T32 Research Training in Cardiovascular Biology at Meharry Medical College (P30AI110527).

IDENTIFICATION OF REPURPOSED DRUGS AS SARS-COV2 INHIBITORS

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Abstract

PURPOSE: COVID-19 is a pandemic disease caused by the emerging virus, SARS-CoV2. Since the beginning of the pandemic, an enormous effort has been initiated worldwide to develop new drugs for treatment of COVID-19. This study aims to identify repurposed drugs capable of blocking SARS-CoV2 entry into cells for the development of novel COVID-19 antivirals. Our efforts focused on targeting the spike (S) protein, which is responsible for mediating the initial steps of infection. We hypothesize that drugs capable of disrupting the interaction of the S protein with the ACE2 cell receptor and/or interfere with virus entry events will reduce the infection levels in target cells. METHODS: Virtual screening of a commercially available compound library was done to identify drugs that showed energetically favorable interactions with the S protein. From the virtual screening, 53 out of 444 drugs were selected for in vitro testing using Spike:ACE2 Inhibitor Screening Assay and virus entry assays. RESULTS: Three drugs (MCE-8, MCE-13, MCE-50) showed a significant decrease in the infection levels (IC50<1µM). Nevertheless, only MCE-8 disrupted the interaction of the S protein with the ACE2 cell receptor. These results suggest that the three drugs (MCE-8, MCE-13, MCE-50) identified with antiviral activity have different molecular mechanisms. To determine which entry mechanism (endocytosis or membrane fusion) the antiviral candidates are disrupting, the virus entry assays were repeated in the presence or absence of the cellular protease TMPRSS2, which is essential only for membrane fusion. The results showed that MCE-13 only blocks virus entry by endocytosis, while MCE-8 interferes with receptor binding and endocytosis, and MCE-50 blocks virus entry using both mechanisms. CONCLUSION: These results suggest that all three MCE drugs are promising antiviral candidates and support further evaluation using animal models.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.06 - Infectious and Immunological Diseases (non-HIV) - RESEARCH ABSTRACT

Grant Support: GRANT SUPPORT: This research was partially supported by the UPR Emergency COVID-19 Research Project Program and the Collaborative Research in Health Disparities, NIMHHD grants U54MD007600.

ATP6V0A4/ZAR1L AXIS IN BREAST CANCER

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Abstract

ZAR2 is a recently characterized RNA-dependent transcriptional repressor protein that is implicated in the cell cycle-dependent regulation of BRCA2 gene expression. We have shown previously that ZAR2 mRNA is transcribed from the overlapping bi-directional promoter of the BRCA2 gene, binds to the overlapping promoter and prevents the expression of BRCA2 through chromatin remodeling. ZAR2 level is significantly low in the invasive breast cancer cells and tissues as compared to the non-invasive cells. Knockdown of ZAR2 in the non-invasive breast cancer cells increased the in vitro invasiveness of these cells whereas forced expression of ZAR2 in the invasive breast cancer cells prevented their invasiveness. To understand the possible mechanism of ZAR2-mediated regulation of invasiveness of the breast cancer cells we studied differential gene expression in the ZAR2 knocked down non-invasive breast cancer cells by RNA-seq analysis. One of the genes that are significantly elevated in the ZAR2 knocked down cells is the invasion determining enzyme ATP6V0A4. ATP6V0A4 is transcribed from an overlapping bi-directional promoter along with its partner TMEM213 in the breast cancer cells. We found that both ATP6V0A4 and TMEM213 levels are increased in the ZAR2 knocked down cells whereas cells with forced expression of ZAR2 have a significant decrease in the levels of these proteins. ZAR2 cell cycle dependently binds to the ATP6V0A4/TMEM213 gene promoter to repress the activity of this bi-directional promoter. This study thus reports a new pathway for the regulation of the invasiveness of breast cancer cells.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: MMCSOGS, PECIR, 1U54RR026140 & 2U54MDOO7586-32 to SM

NICLOSAMIDE ANALOGS FOR ENZALUTAMIDE-RESISTANT PROSTATE CANCER

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Abstract

PURPOSE Androgen receptor (AR) signaling plays a vital role in the development and progression of prostate cancer (PC). The constitutively active androgen receptor splice variants (AR-Vs) that lack ligand binding domain (LBD) is often associated with resistance to current androgen deprivation therapies (ADTs). Studies have shown that niclosamide effectively down regulates AR-V7, which makes it as an invaluable drug template for drug resistant PC. The main purpose of this study is to make novel series of niclosamide analogs and identify AR-Vs inhibitors with improved pharmaceutical properties. METHODS We synthesized a library of niclosamide analogs by optimizing the substituents on the two aromatic rings. Compounds were characterized using 1H NMR, 13C NMR, MS, and elemental analysis. All the compounds were tested for antiproliferative activity and downregulation of AR and AR-V7 in two enzalutamide resistance cell lines, LNCaP95 and 22RV1, with niclosamide as a positive control. A 3D quantitative structure-activity relationship (3D-QSAR) was obtained based on the structure and antiproliferative activity of all the niclosamide analogs. RESULTS / EXPECTED RESULTS Several compounds exhibited equivalent or improved antiproliferation effect in both LNCaP95 and 22RV1 cell lines, and potent AR-V7 down-regulating activity. The QSAR model gave satisfactory statistical results in terms of q2 and r2 values. DISCUSSION / CONCLUSION We identified niclosamide analogs as a new set of AR-V7 down-regulator which may lead to a novel approach to tackle drug-resistance in PC medicine. 3D-QSAR analysis can be used to guide further structural optimization.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: This study was supported by the National Institute on Minority Health and Health Disparities: NIMHD-RCMI grant number 5G12MD007595, and in part by the Louisiana Cancer Research Consortium (LCRC).

ENGINEERING OF LAYER-BY-LAYER SMART ACETATE COATED PACLITAXEL LOADED POLYLACTIC-CO-GLYCOLIC ACID NANOPARTICLES TO TREAT PROSTATE CANCER

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Abstract

PURPOSE: Prostate Cancer related death is higher in African Americans. A targeted and layer-by-layer nano-delivery system can improve chemotherapy's effectiveness while reducing its side effects. It hypothesized that a layer-by-layer smart nanoparticle (NPs) with a core made of paclitaxel (PTX) -loaded Polylactic-co-glycolic acid (PLGA) NPs and the shell made of Prostate Specific Membrane Antigen (PSMA) ligand can be engineered to potentiate the cytotoxicity of PTX on LNCaP, a metastatic lymph node lesion of human prostate cancer cell line. METHODS: The layer-by-layer smart NPs are prepared in two steps. Step#1, PTX-loaded PLGA NPs are prepared by the nanoprecipitation method in glacial acetic acid/ sodium acetate solution and freeze-dried. In step#2, the smart layer-by-layer NPS are engineered by resuspending the freeze-dried NPs (e.g., step#1) in PSMA'ligand aqueous solution and freeze-dried for the second time. The HPLC was used to assess the chemical stability of PTX. Transmission Electron Microscopy (TEM) was used to characterize both the morphology and size of the smart layer-by-layer NPs. Its cytotoxicity on the LNCaP cell line is assessed by MTS assay. RESULTS The HPLC confirms the chemical stability of PTX. The core-shell NPs are spherical. The particle's mean diameters (PMD) are 144±13 nm based on the TEM imaging. The blank PLGA NPs and blank Smart acetate layer-by-layer NPs, which do not contain PTX, are not cytotoxic to the LNCaP cells. As expected, the Smart layer-by-layer PTX-loaded PLGA NPs are more cytotoxic to the cells than the PTX-loaded PLGA NPs by inhibiting cell growth by about 50% and 30% with 0.4 nM of PTX, respectively, after 48-hour exposure. The Smart NPs show dose-dependent cytotoxicity on the LNCaP cells. CONCLUSION. This unique process of engineering smart PLGA-based NP is promising to potentiate the efficacy and reduce the side effects of Paclitaxel or other anti-cancer drugs targeting prostate cancers.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.08 - Nanotechnologies - RESEARCH ABSTRACT

Grant Support: The research reported was supported by the American Cancer Society Diversity in Institutional Development Grant under award number DICRDG-21-073-01-DICRDG.

HIV NEF NEUROPATHOGENESIS

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Abstract

Brief History of Institution and Its Mission: PHSU was officially established in 1980 by the Ponce School of Medicine Foundation, Inc. as a private self-standing medical school. It is located in the southern coastal city of Ponce (population ca. 135,084) in the US Commonwealth of Puerto Rico (PR). The institution has a 3-fold mission: education, research, and community service. Among its academic initiatives, the institution offers a bilingual medical education and training program leading to the degree of Doctor of Medicine (MD) with a strong emphasis on primary care, family, and community medicine. The Clinical Departments at PHSU operate through a network of affiliated institutions, which includes most major hospitals in the south-southwest region of PR. This MD program is fully accredited by the Liaison Committee on Medical Education (LCME). Since its foundation 43 years ago, the institution has graduated over 2000 physicians who are currently serving the Hispanic, minority population of PR as well as in numerous communities in the continental USA where Hispanics constitute a major ethnic subpopulation.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.05 - HIV and AIDS - RESEARCH ABSTRACT

ROLE OF BAI1 AND BAI1-DEPENDENT SIGNALING IN BREAST CANCER DEVELOPMENT AND PROGRESSION

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Abstract

PURPOSE: While the morbidity and mortality from breast cancer are largely attributable to its metastatic dissemination, the integral features of the cascade are not well understood. Here, we assess cancer cell fusion as a source of breast cancer heterogeneity and metastasis. We previously demonstrated that mesenchymal/multipotent stem/stromal cells (MSCs) fuse spontaneously with breast tumor cells and that resultant hybrids had increased migratory and invasive capability. More importantly, we showed that cancer cell fusion happens in vivo, and promotes tumor heterogeneity and contributes to metastasis. The Phosphatidylserine (PtdSer) receptor Bai1 was shown to promote fusion of myoblasts by means of signaling through the Elmo/ Dock180/ Rac pathway which is also activated in breast cancer. We therefore hypothesized that Bai1 and Bai1-dependent signaling induce breast cancer cell fusion-driven tumor heterogeneity and metastasis. METHODS To test our hypothesis, we determined the ability of breast cancer cells (MDA-MB-231, MDA-MB-157, T47D, HCC1806) depleted of Bai1, Elmo, Dock180, or Rac to fuse with MSCs. The Cre/ loxp-stop-loxp-GFP system was used to identify fusion products. We also determined the ability of breast cancer cells depleted of Bai1 to induce tumor development and progression in vivo using NOD SCID mice. RESULTS We observed that breast cancer cell fusion is significantly reduced when Bai1, Elmo1, Dock180, or Rac1 is inhibited ($P<0.05$). We showed that Bai1 interacts with Elmo in cancer cell fusion and that breast cancer cells isolated from black women appear to fuse more readily with MSCs than cells isolated from white women. Inhibition of Bai1 also reduced tumor growth in xenograft mice. DISCUSSION/CONCLUSION Our results suggest that activation of the Bai1-driven Elmo/Dock180/Rac pathway is implicated in breast cancer cell fusion. Targeting the Bai1/Elmo/Dock180/Rac signaling could represent a novel approach for breast cancer treatment, especially for the

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: NIH/NIHMD grant 5U54MD015929-03 and the Society for Investigative Dermatology (SID) Freinkel Diversity Fellowship (to FKN)

NOVEL MOUSE MODEL GABRB3+/N328D HAS REDUCED GABAA RECEPTOR B3 SUBUNIT EXPRESSION DISPLAYING EPILEPSY AND COGNITIVE DEFICITS

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Abstract

PURPOSE The β3 subunit of the GABAA receptor is abundantly expressed during the development of the central nervous system and its mutation has been linked to Lennox-Gastaut Syndrome (LGS) in humans. The impact of the mutation in the brain and how it can cause a developmental and epileptic phenotype are poorly understood. There are scarce models of this syndrome available for therapeutic research. We have developed a novel mouse model of LGS (Gabrb3+/N328D) to characterize the major defects caused by the mutation from molecular to neurobehavioral levels. We will determine if Gabrb3 expression is affected in this model and etiological of an LGS phenotype. METHODS Expression of the α2, β3, and γ2 subunits of the GABAA receptor in extracted brain regions: cortex, cerebellum, hippocampus, and thalamus will be investigated via immunoblot in wild-type and Gabrb3+/N328D knock-in mice. Video monitoring and synchronized EEG recordings will be conducted to evaluate the effect of the GABRB3(N328D) mutation on seizure severity. Neurobehavioral paradigms including the Barnes maze for spatial learning and memory, the elevated zero maze for anxiety assessment, and the three-chamber social interaction chamber were utilized for identifying any cognitive abnormalities commonly seen comorbid to LGS. RESULTS The expression of β3 subunits was reduced in the cerebellum, hippocampus, and thalamus in the Gabrb3+/N328D. Neurobehavioral tests showed a reduction in locomotion, learning and memory capabilities, and sleep and drinking behavior in comparison to wild-type mice. Last, the Gabrb3+/N328D mice do show significant seizure severity with principal seizure types seen in a clinical diagnosis of LGS. DISCUSSION The Gabrb3+/N328D knock-in mouse model does serve as a pertinent model to study LGS pathophysiology and therapeutic intervention. We have observed a seizure phenotype in line with a clinical diagnosis of LGS along with cognitive impairment indicative of developmental delay.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.09 - Neuroscience and Mental Health - RESEARCH ABSTRACT

Grant Support: This research was funded by research grants from National Institute of Health (NINDS) 444 NS082635 and NS121718 to J.K. This work was also supported by grant 5R25GM059994-22 for G.N.

LPS-INDUCED LUNG INJURY INVOLVES INCREASED ALVEOLAR CELL BARRIER PERMEABILITY VIA MMP-9 AND MMP-12

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Abstract

BACKGROUND: Acute lung injury (ALI) and acute respiratory distress syndrome (ARDS) are life-threatening respiratory failures characterized by inflammation in the lungs and pulmonary edema. Pathogens such as bacteria or viruses or sepsis, smoke or chemicals inhalation induce injuries to the lungs. A balanced extracellular matrix remodeling maintains normal lung physiology. Increased activity of ECM degrading metalloproteinase (MMP) alters ECM composition which favors abnormal ECM and cellular activity. In the present study, we investigated whether bacterial wall component lipopolysaccharide (LPS) increases fluid extravasation across alveolar cells barrier via ECM remodeling enzymes MMP-9 and MMP-12. MATERIALS AND METHODS: A549 were subcultured in normal growth media for 24 h, followed by treatment with LPS (1 or 10 ng/ml) for 6 or 24 h. Alveolar epithelium monolayer barrier/permeability was measured using blue dextran extravasation. The expression level of ECM enzymes MMP-9, and MMP-12 and ECM components TGFβ, and Col3A1 were analyzed using real-time quantitative PCR (qPCR). NF-κB activation was analyzed using immunofluorescence, and cell migration was analyzed using wound-scratch assay and Boyden chamber. RESULTS: Alveolar epithelial monolayer permeability was significantly increased by LPS regardless of the dose, the highest tested dose being very potent in inducing dextran blue extravasation (56% increase vs control). LPS significantly increased the expression of MMP-9 by 1.61-fold, and MMP-12 by 3.8-fold vs control. LPS stimulated NF-κB nuclear translocation. LPS also induced cell migration by 37% vs control, respectively. CONCLUSION: These results suggest that LPS increased the levels of MMP-9 and MMP-12 and ECM remodeling by up-regulating TGFβ and Col3A1 via NF-κB transcription factor activation. These results also indicate that MMP-9 and MMP-12 may serve as a therapeutic target in bacterial-induced acute lung injury.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.11 - Pulmonary Diseases - RESEARCH ABSTRACT

Grant Support: U54 MD015929 Project ID 6611

ROLE OF PDGFRALPHA+ FIBROBLASTS IN ASTHMA

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Abstract

PURPOSE Asthma is a chronic respiratory disease characterized by airway remodeling and chronic inflammation. In Hawaii, asthma is a significant public health burden and continues to disproportionately affect minority groups, especially native hawaiians and other pacific islanders (NHOPI). Despite the fact that fibroblasts are well-known contributors of fibrosis, targeting of fibroblasts for antifibrotic therapy is often challenging due to the cellular heterogeneity and versatile properties. Therefore, understanding role of fibroblasts in asthma sequelae is an important step towards developing efficient therapies targeting fibroblast or fibroblast signaling. METHODS AND RESULTS To interrogate how fibroblasts contribute to asthma development, we generated Pdgfra-CreERT2/DTA (herein referred to as Ablated) allowing tamoxifen inducible Cre expression in PDGFRalpha+ cells and diphtheria toxin-A-mediated cell ablation. We observed a 70-80% decrease in PDGFRalpha+ fibroblasts across the entirety of the ablated lung. Overall, the ablated mice survived and maintained normal life span, but they grew thinner and had lower body weight. Histological analysis of the ablated lung showed thin mesenchyme, a modest increased alveolar space, and increased leukocyte infiltration, compared to control lungs. When ablated mice were challenged with House Dust Mite (HDM) extracts for 5 weeks, adverse pathological asthma features, including mucus hypersecretion, fibrosis, and increased immune cell infiltration

ensued. CONCLUSION Our data suggest that PDGFRalpha+ fibroblasts not only serve reparative functions but also regulate type 2 inflammation. This study provides further rational for exploring mechanisms underlying the detrimental effect PDGFRalpha+ fibroblast loss on asthma outcomes and to identify the cellular signals directing.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.11 - Pulmonary Diseases - RESEARCH ABSTRACT

Grant Support: This work was supported by NIH/NIMHD (U54MD007601-34) and the Molecular and Cellular Immunology Core through the funding of the Centers of Biomedical Research Excellence (COBRE) program (P30GM114737).

THE MOLECULAR TARGETS OF EGCG IN LPS ACTIVATED BV-2 MICROGLIAL CELLS

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Abstract

PURPOSE: Persistent neuroinflammation is associated with many neurodegenerative diseases, such as Alzheimer's disease. Microglia are the brain's primary immune cells, and when activated, they release various proinflammatory cytokines. Meanwhile, nutraceuticals with anti-inflammatory and anti-oxidant properties like Epigallocatechin-3-Gallate (EGCG) may be a promising strategy for microglia-activated neurodegenerative diseases. The objective of the current study was to examine the molecular targets underlying the anti-inflammatory effects of EGCG in activated microglia cells. METHODS: BV-2 microglia cells were grown, stimulated, and treated with EGCG. Cytotoxicity and nitric oxide (NO) production were evaluated. Immunoassay, PCR array and WES™ Technology were utilized to evaluate inflammatory, neuroprotective modulators, and signaling pathways involved in mechanistic action of neuroinflammation. RESULTS: Our findings showed that EGCG caused a concentration-dependent decrease in cell viability and significantly inhibited proinflammatory mediator NO production in LPS stimulated BV-2 microglia cells. ELISA analysis revealed that EGCG significantly decreases the release of pro-inflammatory cytokine IL-6, while it increases the release of TNF-α. Furthermore, the evaluation of inflammatory signaling pathways demonstrated that EGCG significantly downregulated the mRNA expression of mTOR, NF-kB2, STAT1, Akt1, Akt3, CCL5, and Smad3 while significantly upregulating the mRNA expression of IL-3, IL-11, A20/TNFAIP3, and Gab1. CONCLUSION: These findings suggest that EGCG may be used for its anti-inflammatory effects to prevent neurodegenerative diseases.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.09 - Neuroscience and Mental Health - RESEARCH ABSTRACT

Grant Support: National Institute of Minority Health Disparities of the National Institutes of Health under Award Number U54 MD007582 and Title III.

EXERCISE, EXOSOMES, AND METABOLIC HEALTH IN TYPE-2 DIABETES

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Abstract

PURPOSE: Native Hawaiians and other Pacific Islanders (NHOPI) have a 2-fold higher prevalence of type-2 diabetes (T2DM) than Whites in Hawaii. Hyperglycemia in T2DM is due to defective insulin action in major metabolic tissues. Exercise is an effective intervention to improve glycemic control and reduce T2DM risk. Many exercise-induced signaling molecules released from skeletal muscle (SkM) are transported in exosomes, a class of nano-sized extracellular vesicles. Exosomes mediate interorgan communication by releasing their cargo which includes proteins and RNAs, from their cell of origin. In preclinical studies, sedentary mice injected with SkM exosomes from exercise-trained mice show improved insulin sensitivity. However, we don’t know how exercise stimulates SkM exosome release or how exercise-induced SkM exosomes increase insulin sensitivity. Our objective is to elucidate the mechanism by which exercise-induced SkM exosomes modulate insulin sensitivity and glucose metabolism of major metabolic tissues. METHODS: Our preliminary studies identified the exocyst protein complex as a potential link between SkM metabolism and exosome production. We will investigate the exocyst’s role in exosome biogenesis

with cell and rodent models. Using purified SkM exosomes pre- and post-exercise, we will identify exercise-induced SkM exosomal cargo using RNA/miRNASeq and proteomics approaches. We will then load selected RNAs and proteins into purified exosomes to assess their impact on cellular metabolism and to identify molecular cargos with beneficial effects. EXPECTED RESULTS: Our studies will help identify the exocyst's role in SkM exosome production and determine how exosomes promote insulin sensitivity post-exercise. CONCLUSION: These investigations will lay the pre-clinical foundation for therapeutic approaches with SkM exosomes and may lead to the development of improved exercise intervention guidelines to benefit NHOPI and others disproportionately affected by T2DM.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.03 - Diabetes, Obesity, and Metabolic Syndromes - RESEARCH ABSTRACT

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ANTITUMOR ROLE FOR HUNTERIA UMBELLATA SEED EXTRACT IN COLON CANCER

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Abstract

Black Americans maintain higher incidence of colorectal cancer (CRC) and related death than White Americans, as well as genetically similar Native Africans. This suggests diet may play a role. The Nigerian plant Hunteria umbellata (HU) is highly valued for its effectiveness in diabetes, obesity, fever, pain, and gastrointestinal discomfort. Sellers of the seed advertise potential roles for antibacterial and anti-inflammatory properties. An initiating event in CRC is inflammation (inflammatory bowel disease) that can result from various stimuli including defective barrier function or even microbial dysbiosis. The effect HU seed extract has in the intestine is largely unknown. Here, we investigated the cytotoxic effect of HU seed extract in CRC cells and assess its role against intestinal inflammation in vitro. Cell viability was measured using Cell Titer Blue assay after treatment of HU extract in HT29, SW480, and SW620 cell lines. Cell migration was assessed using culture inserts to create a “wound” for cells to migrate. Images were taken daily, and area measured using ImageJ. To determine whether HU extract was cytoprotective, IEC6 cells were treated with 2.5% dextran sodium sulfate (DSS) to induce inflammation. HU seed extract shows decreased cell viability in SW480, SW620 and HT29 cells (50-100 ug/mL) while CaCO2 and IEC-6 cell lines were more resistant to HU extract, requiring higher doses (200ug/mL) to induce cytotoxicity. We observed decreased CRC cell migration after HU treatment. Cells pretreated with HU extract had significantly higher cell viability after DSS injury compared to cells that were not pre-treated ($p<0.01$). To assess the restorative effect, cells were treated with DSS for 24h and allowed to recover for 24h. Cell recovery with HU extract showed a significantly increased viability compared to untreated ($p<0.01$). These results demonstrate HU seed extract is preferentially cytotoxic to CRC cells and protective to non-transformed epithelium.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: Research was supported by the National Institute On Minority Health and Health Disparities (NIMHD) of the National Institutes of Health (NIH) under Award Number U54MD007582

HEALTH DISPARITIES IN NEUROLOGICAL OUTCOMES IN PATIENTS INFECTED WITH COVID-19

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Abstract

COVID-19 resulted in a global pandemic by infecting over 680 million people with over 6.8 million deaths. In the USA, non-Hispanic Blacks have substantially higher rates of infection, hospitalization, and death compared with their White counterparts. Currently, COVID-19-infected patients develop neurological complications—including confusion, strokes, cognitive and memory problems, depression, anxiety, neuromuscular disorders, and migraine headaches known as Long COVID. In this study, we evaluate the COVID-19 incidence and its

correlation with the prevalence of nervous system disorders (NSDs); Mental, Behavioral and Neurodevelopmental disorders (MBNDs); and cerebrovascular diseases (CBVD) in various racial and ethnic populations, using anonymous and aggregated data from the Nashville General Hospital (NGH) at Meharry, an Institute for the Study of Minority Health. Of 2592 COVID-19 patients, 34.3% had a diagnosis of NSDs, 46.99% had MBNDs and 6.33% had CVBDs. Of the 883 patients with COVID-19 and NSDs, chronic pain was common symptom (44.2%) followed by Polyneuropathy (17.1%), Insomnia (14.4%), Obstructive sleep apnea (14.3%) and Sleep-apnea (10.2%). Of the 164 patients with CBVD and COVID-19, Shortness of breath (57.6%), Cough (51.5%), Chest-pain (47.9%) and unspecified abdominal pain (47.5%) were the most common. Of the 1216 with COVID-19 and an MBND, the most common symptoms were nicotine dependence (58.1%), anxiety disorder (26.3%), major-depressive disorder, single episode (24.1%) and psychoactive substance abuse (12.8%). Patients who identified as Non-Hispanic Blacks were approximately 4 times more likely than their White counterparts to have an NSD, MBND or CBVD and COVID-19 although NSD and MBND patients without COVID-19 demonstrated no significant difference in occurrence by racial group. Thus, our analysis describes the neurologic manifestations of COVID-19 and suggests future research in understanding COVID-19-related neurological implications.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.06 - Infectious and Immunological Diseases (non-HIV) - RESEARCH ABSTRACT

Grant Support: GRANT SUPPORT: This research was funded by institutional intramural funding.

MONOCYTES AND INFLAMMATORY SIGNALS IN BIPOLAR DISORDER

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Abstract

PURPOSE Bipolar Disorder (BD) is a serious disease of significant public health importance, with symptoms that are severe and disabling. A substantial economic burden on society and healthcare system exist. Our preliminary data found significant immune activation in these patients. Studies are scarce in BD patients related to mood episodes and neurocognitive deterioration. We aimed to investigate the association between the percentage and activation stage of different monocyte subpopulations and mood changes with cognitive deterioration. METHODS Thirty-seven participants (26 cases and 11 controls) were recruited as part of the inflammatory cytokines and neurocognitive functioning in bipolar disorder patients across mood episodes project. We assessed the clinical features and cytokine plasma levels of participants. The percentage of monocyte subpopulations (CD14/CD16) and the activation stage by HLADR levels were evaluated using Flow Cytometry. Neuropsychological tests were used to measure different cognitive domains. All statistical analyses were performed with SPSS version 29 and Graph Pad Prism version 9.5.1 software for Mac. Statistical significance was considered at $p < 0.05$. RESULTS We found heightened inflammatory signals (IL-6, MIG, MCP-1) in these patients, and reduced anti-inflammatory signals (IL-4). BD patients had an increased number of circulating peripheral blood monocytes compared to healthy controls. Serum biomarker concentration showed significant correlation between HLADR levels in CD14++CD16+ and cognitive deterioration in BD patients vs healthy controls ($r = 0.48$, $p = 0.005$). We also found a significant correlation between the percentage of activated CD14+CD16+ HLADR+ and neurocognitive deterioration in BD ($r = 0.46$, $p = 0 .032$). DISCUSSION The findings evidence a significant immune activation in BD including a higher proportion of activated monocytes and inflammatory signals. Worse neurocognitive functioning was found in bipolar patients.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.09 - Neuroscience and Mental Health - RESEARCH ABSTRACT

Grant Support: RCMI grant U54 MD007600 (National Institute on Minority Health and Health Disparities) from the National Institutes of Health. Support was received also from the PRCTRC (U54MD007587); and the Hispanic Alliance for Clinical and Translational Research (U54GM133807).

HYPOXIA INDUCES APOLIPOPROTEIN L1 EXPRESSION IN PODOCYTES

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RK RANDLE; VR Amara; W Popik
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Abstract

PURPOSE: Genetic risk variants (RVs) of Apolipoprotein L1 (APOL1) are highly associated with an increased risk of non-diabetic kidney diseases and kidney failure in African Americans. The pathological effects of APOL1 typically target podocytes, the key cells in maintaining the kidney's filtration barrier. According to genome-wide association studies, environmental factors mainly contribute to this association. We have found that hypoxia, or low oxygen tensions, upregulates the expression of APOL1 in kidney podocytes. The objective of this research is to identify molecular components that regulate increased APOL1 expression in response to hypoxia. METHODS: Human conditionally immortalized AB8/13 glomerular podocytes were exposed to Roxadustat (ROXA), a known inducer of hypoxia, or incubated in controlled hypoxic conditions (95% N, 5% CO2, 1% O2) to stimulate hypoxia. Changes in the expression of APOL1 were analyzed by qPCR and immunoblotting. We further confirmed the role of the DNA sensor IFI16 and the hypoxia-associated transcription factor HIF-1α using siRNA-mediated knockdown and CRIPSR-Cas9 knockout assays. Localization and interactions between IFI-16 and HIF-1α were determined by subcellular fractionation, immunoprecipitation, and immunoblotting. RESULTS: Knockdown of HIF-1α attenuated expression of APOL1 in podocytes treated with ROXA. APOL1 expression in hypoxic podocytes depleted of IFI16 was suppressed, independent of HIF-1α stabilization. Both HIF-1α and IFI16 are present in the nucleus of hypoxic podocytes but do not directly interact with one another. DISCUSSION/CONCLUSION: Our observations suggest that, in hypoxia, IFI16 works cooperatively with HIF-1α to promote APOL1 expression. These results are consistent with our hypothesis that hypoxic stress may exacerbate the pathological effects of APOL1 risk variants (RVs) in glomerular podocytes. With further investigation, our work may reveal therapeutic targets for APOL1-associated nephropathy in African Americans.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.04 - Gene-Environment Interactions - RESEARCH ABSTRACT

Grant Support: This project is supported by the NIH-T32HL007737-27 Grant

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MSH3: AN UNDERESTIMATED DNA MMR GENE IN COLORECTAL CARCINOGENESIS AND ITS POTENTIAL ROLE IN DISPARITY

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Abstract

Background: Unique mutations in cancer genes have been found in different races including African Americans (AA) population. Maintenance of proficient mismatch repair genes is important in colorectal cancer (CRC). Among them, MSH3 is found to be more important in CRC in AA particularly as its alterations associate with EMAST phenotype that has poor prognosis. However, there are regional variations in the classification and criteria used to determine the pathogenicity of these mutations particularly in AA due to their high genomic diversity. Aim: To analyze and validate unique and novel MSH3 mutations using in-silico prediction tools and their biological significances in AA-CRC. Results: In this study, we validated our targeted exome sequencing data of MSH3 mutations in AA and Caucasians (CA) CRC samples. A cost effective in-silico approach was employed to narrow down most significant MSH3 mutations. Interestingly, we found six non-synonymous novel, pathogenic mutations in MSH3 gene (c.G1237A, c.C2759T, c.G1397A, c.G2926A, c.C3028T, c.G3241A) in AA-CRC. Also, we observed loss or gain of different chemical bonding patterns (hydrogen, ionic, hydrophobic, and di-sulfide) between wild type and mutant MSH3 protein. Interestingly, some of these mutations were within the ATPase site while others are in MSH3-MSH2 interacting domains. Furthermore, Molecular Dynamics Simulation (MDS) of these six variants showed an overall effect on MSH3 protein stability especially in MSH3-MSH2 interaction compared to wild type MSH3.Conclusion: MSH3 mutants showed higher RSMD values, fewer hydrogen bonds, and lower free energy than the wild type. These findings suggest that the mutations may have disrupted MSH3-MSH2 complex folding and interaction, leading to functional abnormalities and DNA repair defects. Further CRISPR-Cas9 knock-in studies are

underway to mimic these mutations in large cohort is ongoing and could explain EMAST phenotype prevalence and poor prognosis in the AA population.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: R01 CA258519-01

MAGNETO-LUMINESCENT NANOARCHITECTURES FOR RAPID SEPARATION AND IDENTIFICATION OF LUNG CANCER DERIVED EXOSOMES ASSOCIATED WITH CANCER METASTASIS AND THERAPY RESISTANCE

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Abstract

As per American Cancer Society, compared with all other racial and ethnic groups, the lung cancer incidence rate for African Americans are highest and survival rate is lowest for in USA,. Due to the lack of early detection before metastasis and failure of current therapy for cure the disease, lung cancer contributes to the highest cancer related mortality worldwide. Non-small cell lung cancer (NSCLC) derived exosome such as tenascin C (TNC) (+) exosome promotes metastasis via regulating epithelial–mesenchymal transition (EMT). Similarly, amphiregulin (AREG) (+) exosomes are associated with cetuximab-based chemotherapy resistance for NSCLC and programmed cell death ligand-1 (PDL1) (+) exosomes are associated with immunotherapy resistance for NSCLC, via establishing tumor microenvironmental remodeling. Diagnosis of TNC (+), AREG (+) and PD-L1(+) exosomes are emerging as novel biomarkers in clinics for non-invasive NSCLC cancer diagnosis and predicating chemo and immunotherapy outcomes. However, due to the heterogeneity, rapid isolation and specific multiplex detection of those exosome is challenging. To address the above problem, herein, we report the design of antibody-conjugated multi-color emissive magneto-luminescent nanoarchitecture for targeted separation and identification of TNC (+), AREG (+) and PD-L1(+) exosomes selectively and simultaneously from whole blood sample. Notably, reported data demonstrate that antibody-conjugated magneto-luminescent nanoarchitecture can be used for analysis of lung cancer-derived exosomes from whole blood sample infected with AREG (+), TNC (+) and PD-L1 (+) exosomes simultaneously, which indicate great potential for the nanoplatform for possible applications in clinics.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.08 - Nanotechnologies - RESEARCH ABSTRACT

Grant Support: We are also thankful for NIH-NIMHD Grant U54MD015929-01 for lung cancer research and the bioimaging core facility.

JAK1 V666G MUTANT IMPAIRS IL-2 SIGNALING IN LEUKEMIA

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Abstract

PURPOSE: Loss of function Janus tyrosine kinase (JAK) mutations are related to immunodeficiency, while gain of function mutations are associated with hyperactive kinase activity that drives leukemia. Hispanic children experience higher incidence rates of leukemias and experience disproportionate health outcomes post-therapy. Here we sought to identify new JAK mutations within primary Hispanic leukemia patients. METHODS: To understand the role of JAK kinases in this health disparity, we performed whole exome sequencing (WES) on a small cohort of Hispanic leukemia samples. The novel JAK1 V666G mutation was identified and a functional-structural approach was undertaken to investigate the mutation's ability to modify kinase activity and influence other JAK kinases in the Interleukin-2 (IL-2) pathway. To evaluate the impact of this mutation on JAK1 and the IL-2 signaling pathway, the mutation was recreated by site-directed mutagenesis followed by in vitro kinase assays and co-transfections in U4C cells. Structural analysis of JAK1 was performed using ChimeraX. RESULTS: The JAK1 V666G mutation led to hypo-activation seen by reduced tyrosine phosphorylation. V666G causes a dominant negative effect of inactive JAK1 on JAK3 autophosphorylation. The JAK1 V666G exhibited an inhibitory effect on auto-activation, cross-activation, and IL-2 induced trans-activation in vitro. JAK1 V666G was also observed to inhibit tyrosine phosphorylation of the JAK3 A573V activating leukemia

mutant. The structural analysis identified differing molecular interactions within the pseudokinase region surrounding V666 in “open” and “closed” JAK1 configurations that may impact enzymatic activity. DISCUSSION/CONCLUSION: JAK1 V666G not only inhibited its own activity but its presence inhibits other JAK kinases including hyperactive oncogenic mutations. These findings provide new insights into the JAK1 pseudokinase V666 region and its potential to be exploited for allosteric modulation of hyperactive JAK kinase

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: National Institute on Minority Health and Health Disparities, a component of the National Institutes of Health (5U54MD007592)

NOVEL HYDRAZONE COMPOUNDS WITH ANTIPLASMODIAL ACTIVITY

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Abstract

PURPOSE Multidrug-resistant Plasmodium parasites are alarmingly increasing, threatening malaria control worldwide. Inhibiting multiple parasitic stages is a fundamental component of novel antimalarial drugs to treat malaria and interrupt transmission. Our laboratory previously identified seven compounds with activity in P. berghei blood stages from an in silico screening against Plasmodium glutathione S-transferase. METHODS This study aims to determine the drug combination interaction and activities in multiple Plasmodium stages of the compounds. Using a Machine Learning tool, potential synergistic combinations between compounds and first-line antimalarials were identified and validated using isobologram assays. Compound activity in Plasmodium falciparum resistant and sensitive blood stages was performed using Malaria SYBR Green. The inhibition of P. cynomolgi liver schizonts and hypnozoites was evaluated in prophylactic and radical cure modes. The antiplasmodial activity against P. falciparum oocyst development was tested by oocyst quantification in Anopheles gambiae mosquitoes. The inhibition of P. berghei ookinete formation was assessed by luciferase experiments. The compound activity in P. berghei sexual stages was determined by microgamete conversion assays and macrogamete flow cytometry. RESULTS Isobolograms demonstrate that one compound acts synergistically with two first-line antimalarial drugs. Preliminary data show that the seven antiplasmodial compounds inhibit blood development in sensitive and resistant P. falciparum strains. Interestingly, CB-41 showed prophylactic antiplasmodial activity against P. cynomolgi liver schizonts and hypnozoites. Five compounds inhibit P. berghei ookinete growth, and three compounds hinder P. falciparum oocyst formation in mosquitoes. No activity was detected in P. berghei microgametes and macrogametes. CONCLUSION This study supports these antiplasmodial compounds as potential candidates for further antimalarial drug development.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.06 - Infectious and Immunological Diseases (non-HIV) - RESEARCH ABSTRACT

Grant Support: This research was partially supported by RCMI award U54MD007600 and NIH RISE grant RISE 5R25GM061151-20.

REDUCED ORAL MYCOBIOME DIVERSITY AS A POTENTIAL CANCER RISK FACTOR FOR PUERTO RICAN PEOPLE WITH HIV

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Abstract

Despite antiretroviral therapy, people with HIV (PWH) have an increased risk of developing cancer compared to people without HIV (PWOH). Dysbiosis of the oral microbiota in PWH can contribute to persistent inflammation by upregulating TGF-β1, a biomarker of microbial-induced oncogenesis. This can promote microbial translocation into the bloodstream and increase cancer risk at both local and distant sites. In this study, we characterized the oral bacteriome and mycobiome in the saliva of Puerto Rican PWH and PWOH and correlated their composition with markers of inflammation and cancer risk in saliva. Saliva, sociodemographic, and clinical data from 80 adults were collected (50 PWH and 30 PWOH). All PWH were virally suppressed (<50 copies/mL) with median CD4 counts of 699.8 cells/µL . 16S DNA and ITS in saliva was sequenced to measure bacterial and fungal community composition, respectively. Additionally, inflammatory markers (TGF-β1, Il-2, Il-6, Il-17, and IL-1β) were measured in saliva with quantitative immunoassays. Microbiome data was analyzed using Qiime2 and statistical analysis was done with R software. Alpha diversity in the oral bacteriome was not significantly different between PWH and PWOH. However, PWH showed lower alpha diversity in the oral mycobiome than PWOH (Shannon: 4.19 vs 4.32, p=0.04, and Faith: 7.66 vs. 7.26, p<0.01). Moreover, PWH showed higher levels of TGF-β1 (p<0.05), IL-2 (p<0.01), and IL-8 (p=0.01) in saliva compared to PWOH. Shannon index in the oral mycobiome was inversely associated with higher levels of TGF-β1 (r=-0.23,p=0.04). Furthermore, Shannon index in the oral bacteriome was inversely associated with lower levels of TNF (r=-0.29 ,p<0.01), IFN-γ (r=-0.22,p=0.05), IL-2 (r=-0.29,p<0.01), and IL-8 (r=-0.34,p<0.01). Our findings suggest that oral microbiome dysbiosis contributes to persistent inflammation in the oral cavity independent of HIV status, but particularly the oral mycobiome might play a stronger role in cancer risk in PWH.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.05 - HIV and AIDS - RESEARCH ABSTRACT

Grant Support: Funding sources: This project was supported by the National Cancer Institute: CAPAC Program R25 CA240120, Diversity Supplement 3R21CA264606-01S1 and U54 CA096297. This project was also supported by the National Institute on Minority Health and Health Disparities: RCMI Program U54 MD007600. This project was also supported by the National Human Genome Research Institute through the program Increasing Diversity in Genomics for the Next generation (IDGeNe) R25 HG012702. We would also like to thank Puerto Rico-Community Network for Clinical Research on Aids (PR-CoNCRA) and Hispanic Alliance for Clinical & Translational Research (U54 GM133807) for providing us with support in recruitment and specimen collection, and especially to our study participants.

PRECLINICAL DEVELOPMENT AND CHARACTERIZATION OF GT-14, A NOVEL GIA2 INHIBITOR FOR PROSTATE CANCER

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Texas Southern University

Abstract

Giai2 (heterotrimeric G-protein subunit alphai2) protein plays a critical role in cell migration and invasion of prostate cancer cells. Using a structure-based approach, several small molecule inhibitors were synthesized by Dr. Adegboyega Oyelere at George Tech and characterized by Dr. Shafiq Khan at Clark Atlanta University. Those compounds could specifically prevent the activation of the Gαi2 subunit, keeping the protein in its inactive GDP-bound state. One of the lead molecules, GT-14, showed significant inhibition of the migratory behavior of the PC3 and DU145 prostate cancer cell lines at a concentration of 10 µM. We further conducted the preclinical development of GT-14 at TSU. Physicochemical properties (pKa, log P and solubility) of GT-14 were determined and a cosolvent formulation was developed. UPLC and LC-MS/MS assay methods for GT-14 were developed for quantification of in vitro and in vivo samples. In vitro metabolism studies (Phase I and II) were carried out using rat liver microsomes. A pharmacokinetics study of GT 14 with intravenous dosing (5 mg/kg in cosolvent formulation) was performed in male SD rats. PK parameters were derived using Phoenix WinNonlin. GT-14 is a weakly basic compound with very poor water solubility and high lipophilicity (log P> 3). It has a pKa of 3.46 and 10.53. It is freely soluble in DMSO and DMA and shows high solubility in organic solvents. A cosolvent formulation consisting of PEG 300, PEG 400 and Propylene glycol was developed with a solubility of 8 mg/ml, and was well tolerated by rats. The concentration-time profile of GT-14 fits a 2-compartment model, showing a distrib

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: National Institute on Minority Health and Health Disparities of the National Institutes of Health (NIH) under award number 2 U54 MD007605-27A1.

EFFECTS OF STRESS AND COCAINE EXPOSURE ON SEEKING BEHAVIOR

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Abstract

Comorbidity between cocaine addiction use disorder (CUD) and trauma/stressor-related conditions has been documented repeatedly, indicating a strong link between stress and cocaine use. In addition, some mental illnesses, such as anxiety, and trauma-related disorders, are identified as risk factors for developing a drug addiction. Studies have also shown gender-related health disparities and healthcare disparities, with women having higher rates of comorbidity between SUDs and other mental illnesses than men but with lower treatment rates. Therefore, this research aims to provide insight into how stress influences cocaine acquisition and seeking behavior in male and female rats. We hypothesize that chronic stress prior to cocaine self-administration will increase cocaine use and, after 30 days of abstinence, will increase active lever pressing in cue-induced and cocaine-induced seeking behavior in both sexes. We employed an inescapable footshocks (IFS) paradigm for 5 days at an intensity of 0.55mA, followed by 6-hour sessions of extended-access cocaine self-administration (SA) for 10 days, and subsequently, a 30 days of forced abstinence in male and female rats. Subsequently, we examined cue-induced and cocaine-induced seeking behavior. Our data show that IFS prior to cocaine SA decreases cocaine consumption in female rats but not in males. Interestingly, after 30 days of forced abstinence, female rats show an increase in cue reactivity in the stressed group compared to non-stressed rats, while males show similar cue reactivity in both groups. Furthermore, stressed male rats showed an increase in cocaine-primed memory retrieval compared with the non-stressed group after 30 days of withdrawal, while female rats did not show any difference. Our findings suggest that chronic stress prior to extended-access cocaine SA produces sex differences in cocaine consumption, cue-induced, and cocaine-induced seeking behavior.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.09 - Neuroscience and Mental Health - RESEARCH ABSTRACT

Grant Support: NIGMS-Institutional Development Award (IDeA)]-PR-INBRE Developmental Research Pilot Project Program-P20 GM103475-19; NMHHD, Ponce School of Medicine Research Centers of Minority Institutions Program (RCMI)-Supplement Project-3U54MD007579-37S1

APOBEC3G MUTATION RENDERS HUMAN CD4+ T CELLS RESISTANT TO HIV-1 INFECTION

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Abstract

Apolipoprotein B mRNA-editing enzyme-catalytic polypeptide-like 3G (Apobec3g or A3G) is a host restriction factor that impedes HIV-1 replication. Viral integrity is salvaged by an HIV-1 accessory protein termed virion infectivity factor (Vif), which mediates A3G polyubiquitination and subsequent cellular depletion. It has been reported that a single amino acid point mutation from Aspartic Acid (D) to Lysine (K) at amino acid residue 128 of A3G (A3GD128K) will render A3G resistant to Vif-induced degradation and inhibit HIV-1 replication in overexpression system. The feature of A3GD128K antiviral function may present a potential for developing gene therapy for HIV/AIDS treatment. In this study, we established a high-efficient CRISPR Cas9 gene editing method to knock in A3GD128K mutant into human CD4+ T cell lines and primary hematopoietic stem cells (HSC). After evaluating 15 candidate guide RNAs, we obtained one guide RNA, which led to a knock-in rate of up to 92% in H9 (a CD4+ T cell line) and 66% in primary HSC. In a long-term HIV-1 replication system, H9-D128K cells showed complete long-term resistance to HIV-1 infection. The study shed light on A3GD128K mutant as a strategy for AIDS therapy and laid a foundation for future HIV-1 cure strategy development.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.05 - HIV and AIDS - RESEARCH ABSTRACT

Grant Support: DOD grant (W81XWH-20-1-0062) and NIH RCMI grant (U54MD007586)

INSIGHTS INTO THE PHOSPHOPROTEOMICS OF SARS-COV-2 VIRION

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Abstract

PURPOSE Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) caused worldwide pandemic with over 4 million deaths since the begging of the outbreak. Despite the progress in vaccination, understanding the role of protein phosphorylation in SARS-CoV-2 replication is largely incomplete. METHODS To address this gap, and to better understand the biology of SARS-CoV-2, SARS-CoV-2 virions were purified from infected Vero-E6 cells and their protein composition and protein phosphorylation was analyzed by high resolution liquid chromatography-linked tandem mass spectrometry (nano LC-MS/MS). RESULTS We detected several viral proteins including M, N and open reading frames (ORFs). Over 500 phosphorylation sites are predicted for SARS-CoV-2 viral proteins. Among them 47 serine phosphorylated peptides belong to M, N, and ORFs viral proteins. Within N protein, there were also 15 threonine phosphorylated sites. We also detected 6580 phospho-modifications of host proteins packaged in SARS CoV-2 virions. Of all the host proteins identified CAVIN2, DIMT1, LARP1B, H1-5, MOV10, NOP16, RASSF7 have been previously shown to interact only with the viral N protein. We also detected protein phosphatase-1 (PP1)-interacting proteins that included MAP3K, TRIM21, PPP1R, PLCL2, GRB2. DISCUSSION / CONCLUSION We detected majority of SARS CoV-2 proteins. Several host proteins that we found in the virions have been previously identified as interacting with structural or non-structural proteins encoded in the SARS-CoV-2 genome. SARS-CoV-2 has also been reported to affect several kinases including DPH5, CDK2, CDK4, MAPK9, PIKFYVE, and EIF2AK1. PP1, a serine/threonine phosphatase, has been previously reported to be involved in the regulation of a number of viruses. In the present study, several known interactors of PP1 have been identified that interact with PP1 through the RVxF motif. Inhibition of these interactions could have great potential as therapeutic drug targets to cure COVID-19 patients.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.06 - Infectious and Immunological Diseases (non-HIV) - RESEARCH ABSTRACT

Grant Support: This work was supported by NIH grant 5U54MD007597.

ADIPOCYTE EXPOSURE TO MAMMOSPHERES PROMOTE AGGRESSIVE BEHAVIOR

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Abstract

PURPOSE: Adipocytes in contact with breast cancer cells transform into cancer associated adipocytes, which have the potential to induce aggressive characteristics including enrichment of mammary cancer stem cells. We have reported increased differentiated beige/brown adipocytes in the microenvironment of xenografts from breast cancer cells. Since breast cancer is a heterogeneous disease, specific cancer cell types that induce transformation of adipocytes remain poorly understood. We hypothesize that differentiated beige/brown adipocytes interact with mammary cancer stem cells to increase aggressive breast cancer characteristics. METHOD: Mammospheres isolated from breast cancer cell lines, HCC 1806 and MDA-MB-468 were exposed to mouse differentiated and undifferentiated pre-adipocyte 3T3L1 cells. Cells were harvested following 72h of incubation, and RT-PCR conducted for key mammary cancer stem cell, angiogenesis, and cytokine markers with mouse and human primers. RESULTS: Our differentiated adipocytes had increased expression CD 137, TMEM26 and Tbx1 when compared to pre-adipocytes. We found mammospheres from breast cancer cells induce aggressive gene signatures specifically in differentiated adipocytes, but not in undifferentiated pre-adipocytes. We found increase in Sox2 (12-fold), Oct4 (20-fold), Vegfr2 (8.4-fold), Il6 (5-fold), Cd

163 (16-fold) in differentiated adipocytes when compared to similar incubation with pre-adipocytes. All the changes were normalized to GAPDH. In sharp contrast, aggressive gene signatures were observed in breast cancer cells only when exposed to 3T3- L1 pre-adipocytes but not when exposed to differentiated adipocytes. DISCUSSION: Mammospheres from breast cancer cells induce pro-tumorigenic gene signatures in differentiated adipocytes when compared to undifferentiated adipocytes. Better understanding of key players in these interactions will enable efficient targeting and controlling tumor growth.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: This work was supported by NIH grants SC1CA232319 (SP), R16GM145591 (RS), and in part by UHI NIMHD S21MD000103, and U54MD007598 (CDU).

FOLLISTATIN INHIBITS ELECTRONIC CIGARETTE-INDUCED AEROSCLEROSIS

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Abstract

PURPOSE: Electronic cigarette (E-cig) is the leading cause of preventable death worldwide. E-cig delivers nicotine that accelerates the progression of cardiovascular diseases (CVD) including atherosclerosis. E-cig containing 2.4% nicotine, E-cig (2.4%) exacerbated plaque formation in ApoE-null mice. Follistatin (Fst) protein level was significantly reduced in liver and adipose tissues of E-cig (2.4%) mice compared to the control saline group. We hypothesized that Fst may protect against the development of E-cig (2.4%)-induced atherosclerosis. METHODS: Adenoviral vector-containing null (AAV1-null) or FST344 (AAV1-FST344) were injected in lipoprotein receptor null (LDLR-/-) mice and exposed to either saline or E-cig (2.4%) and fed western diet for 12 weeks. Liver, heart, and adipose tissues were analyzed markers of adhesion and inflammation (western blot and real-time PCR). Plasma levels of triglyceride (TG), total cholesterol, free fatty acid (FFA) and high density lipoprotein (HDL) were analyzed by enzyme-linked immunosorbent assay (ELISA). Atherosclerosis progression were compared between groups by en-face lesion analysis. RESULTS Significant decrease in plasma TG and TC, but increase in HDL levels were found in AAV1-FST344 injected mice compared to the AAV1-null mice. Aortic lesion was significantly decreased (p=0.03) in the FST injected group. Protein expression levels of vascular cell adhesion molecule 1 (VCAM-1), tumor necrosis factor-α (TNF-α), interleukin 6 (IL6) were decreased in liver, heart and adipose tissues of AAV1-FST344 mice compared to the AAV1-null mice. E-Cig (2.4%) exposure-induced activation of alpha 7 nicotinic acetylcholine receptor (α7nAChR) and its downstream targets was inhibited by Fst gene delivery. DISCUSSION: Fst significantly decrease atherosclerosis progression in E-cig/nicotine exposed LDLR-/- mice, suggesting possible anti-atherosclerotic role for Fst.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.02 - Cardiovascular and Cerebrovascular Diseases - RESEARCH ABSTRACT

Grant Support: TRDRP grant T31IP1551 (RS), R16GM145591 (RS), SC1CA232319 (SP), NIMHD S21MD000103, and U54MD007598 (CDU).

FOLLISTATIN, ADIPOSE BROWNING AND ATHEROSCLEROSIS

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Abstract

PURPOSE: Atherosclerosis-associated cardiovascular diseases (CVD) is the leading cause of morbidity and mortality. Adipose browning is linked to reduction of total cholesterol (TC) and triglyceride (TG) levels. We have previously identified follistatin (Fst) as a promoter of adipose browning. We aim to determine the role of Fst-induced adipose browning during atherosclerosis. METHODS: Adenoviral vector-

mediated delivery of null (AAV1-null) or FST344 (AAV1-FST344) viral vectors in lipoprotein receptor null (LDLR-/-) mice was performed (12 weeks on western diet). Liver and adipose tissues were analyzed for adipose browning and markers of adhesion and inflammation (western blot and real-time PCR). Plasma levels of lipoprotein, TG, and TC (ELISA) and atherosclerosis progression (en-face lesion analysis) were compared between groups. Comprehensive analyses of transcriptomic and metabolomics data from hybrid mouse diversity panel (HMDP) was performed to identify critical Fst gene/plasma metabolite as well as gene aortic lesion correlation analysis. RESULTS: Lower aortic lesion and plasma TG, TC and FFA were found in AAV1-FST344 group compared to the control null group. Upregulation of of uncoupling protein1 (UCP1) and CD137 expression as well as decrease in vascular cell adhesion molecule 1 (VCAM1), and tumor necrosis factor α (TNFα) expression was found in AAV1-FST344 liver and adipose tissues. Liver TG and Oil-Red O positive area was significantly lower in AAV1-FST344 group. Fst gene expression in HMDP data set was negatively correlated with aortic lesion. Plasma metabolite aortic lesion correlation set identified arginase 1 (ARG1)-catalyzed metabolic pathway as a key regulator of atherosclerosis that was upregulated in in liver and adipose tissues of AAV1-FST344 group. DISCUSSION: Fst favorably regulate lipoprotein metabolism and inhibits the progression of atherosclerosis.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.02 - Cardiovascular and Cerebrovascular Diseases - RESEARCH ABSTRACT

Grant Support: R16GM145591 (RS); TRDRP grant T31IP1551 (RS), SC1CA232319 (SP), NIMHD S21MD000103, and U54MD007598 (CDU)

INTER-ORGAN CROSS-TALK, FOLLISTATIN, AND ADIPOSE BROWNING

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Abstract

PURPOSE: We have previously reported that follistatin (Fst), promotes adipose browning and favorably alters lipid metabolism in transgenic mice overexpressing follistatin (Fst-Tg) from a muscle-specific promoter. The objective of this study is to investigate possible inter-organ communication between muscle and adipose tissue during Fst-induced adipose browning. METHODS: Protein and gene expression of several well-known myokines including interleukin 6 (IL-6) and fibroblast growth factor 21 (FGF-21) implicated in promoting adipose browning and regulating insulin signaling pathway were compared between gastrocnemius (Gas) and levator-ani (LA) muscle tissues from wild type (WT) and Fst-Tg by western blot and real-time quantitative PCR. Plasma levels of Fst, IL-6, and FGF-21 were compared between the WT and Fst-Tg mice by enzyme-linked immunosorbent (ELISA) assay. Serum metabolites between the groups as well as cell metabolites from differentiated 3TL-1 and Fst-overexpressing 3T3-L1 Fst cells were analyzed by liquid chromatography/mass spectrometry (LC/MS). RESULTS: Both muscle groups from Fst-Tg expressed significantly higher levels of FGF21 and IL6 along with several other myokines known to promote adipose browning compared to the WT. Plasma levels of Fst, IL6, and FGF21 were significantly higher in the Fst-Tg mice. Insulin signaling as well as IL6-mediated STAT3 phosphorylation known to upregulate uncoupling protein1 (UCP1) expression and adipose browning were also upregulated in the Fst-Tg group. Several key metabolites reported to promote adipose browning were significantly induced both in plasma and cell metabolites following Fst overexpression both in vitro and in vivo. DISCUSSION: Increased levels of Fst in muscle tissues as well as in adipocyte cells could promote adipose browning, influence insulin signaling pathway and favorably alter plasma and cell metabolite levels to influence metabolic characteristics.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.03 - Diabetes, Obesity, and Metabolic Syndromes - RESEARCH ABSTRACT

Grant Support: R16GM145591 (RS); TRDRP grant T31IP1551 (RS); SC1CA232319 (SP); U54MD007598 & S21MD000103 (CDU)

AK3 PS449 IS INDUCED BY IL-2 AND IL-15 CYTOKINES

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Abstract

PURPOSE Many hematological disorders, including malignancies, are driven by mutations of Janus Kinase 3 (JAK3), which is a critical mediator of Interleukin-2 (IL-2) and IL-15 signal transduction pathways. Somatic mutations within JAK3 kinases are associated with Acute Myelogenous Leukemia (AML) and Acute Lymphoblastic Leukemia (ALL), which disproportionately afflict Hispanic people. JAK3 tyrosine kinase activity is well-established to be regulated by tyrosine phosphorylation; however, the role of serine phosphorylation is not well studied. Here we report serine phosphorylation within the Src Homology 2 (SH2) domain of JAK3. METHODS We performed mass spectrometry on JAK3 from cells pretreated with an adenylate cyclase activator, forskolin, and stimulated with IL-2. A new phosphoserine (pS) site within the JAK3 SH2 domain, pS449, was identified. To test whether S449 was cytokine inducible, we stimulated the human natural killer like cell line, YT, with IL-2 and IL-15 for up to 60 mnutes. Cellular JAK3 protein was separated by gel electrophoresis and Western blot analysis was performed using phosphospecific antibodies developed against JAK3 pS449. Kinase inhibitor studies were performed to delineate the serine/threonine kinase regulator of S449. RESULTS JAK3 S449 phosphorylation mirrored tyrosine phosphorylation in response to cytokine stimulation. Data obtained from a kinase inhibitor study suggests that PI3K, possibly through the serine/threonine kinase AKT, is regulating phosphorylation of S449 downstream of IL-2. DISCUSSION/CONCLUSION These results provide the first evidence of JAK3 serine phosphorylation in response to common gamma chain (γc) cytokines, IL-2 and IL-15. Based on the location of S449 and the fact that this residue is conserved amongst various species as well as amongst JAK family members, we believe that it plays an important role in JAK3 function. Future work will aim to further characterize the impact of S449 phosphorylation on JAK3 structure and function.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: FUNDING SUPPORT This work was supported by a grant from the National Institute on Minority Health and Health Disparities, a component of the National Institutes of Health (NIH) (5U54MD007592), and National Institute of General Medical Sciences of the NIH under linked Award Numbers RL5GM118969, TL4GM118971, and UL1GM118970. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

CHANGES IN WOMEN'S PHYSIOLOGICAL AND CERVICAL DISEASE STATUS ARE ASSOCIATED WITH CHANGES IN THE CERVICOVAGINAL FUNGAL COMMUNITIES

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Abstract

PURPOSE Cervical cancer (CC) ranks fourth among cancers in women, and its incidence in Caribbean women is higher than in US women. Human Papillomavirus (HPV) is its known etiological agent; however, we hypothesize that dysbiosis of the epithelial-associated microbial communities, both bacterial and fungal, might contribute to the development of CC. This project aimed to investigate the relationship between the cervicovaginal mycobiome in reproductive-age, pregnant and menopausal women while considering cervical neoplasia (lesions) and HPV infection status. METHODS 91 cervical swabs were collected from women at colposcopy clinics in San Juan, Puerto Rico (IRB 1050114). We extracted genomic DNA from swabs and used it for HPV typing and Illumina MiSeq ITS-2 sequencing. Bioinformatic analyses were performed using open-source platforms QIIME2, MicrobiomeAnalyst, and R. RESULTS Fungal community composition and alpha diversity (Shannon) were significantly different between controls (NILM) and participants with high-grade disease (HGSIL) and between HPV- and high-risk HPV infections (P value < 0.05). Sporobolomyces, Rigidoporus, and Candida, were identified as putative biomarkers for HGSIL, LGSIL, and NILM using LEfSe (FDR 0.05; LDA 1.5). According to physiological status, pregnancy – a state with Lactobacillus dominance – had a distinctive fungal structure (P value = 0.020). In contrast, women in menopause with Lactobacillus depletion had a significantly higher fungal richness (P value = 0.006). Sporobolomyces and Candida dominated the cervicovaginal microbiomes of non-pregnant women, while Rigidoporus was related to women with menopause. DISCUSSION This represents the first effort to characterize fungal communities from cervical samples in women from all physiological stages associated with cervical disease. Fungal diversity increased in menopausal women and decreased with cervical disease. Pregnant women with a protective bacterial community seem to create a hostile microenviron

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.07 - Microbiome - RESEARCH ABSTRACT

Grant Support: This project was funded by the Puerto Rico Science and Technology and Research Trust award #2020-00112, NIH/NIMHD Grant No. 2U54MD007600 and HiREC Grant No S21MD00183. Support was also given by the NIH-NIGMS programs Alliance U54MD007587, Center for Collaborative Research in Minority Health and Health Disparities (RCMI) 2U54MD007600 and PR-INBRE 5P20GM103475-17.

WHOLE GENOME SEQUENCE ANALYSIS OF SARS-COV-2 IN HAWAII

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Abstract

PURPOSE: Whole genome sequencing (WGS) is essential for detecting the emergence and spread of SARS-CoV-2 variants. However, WGS of every specimen is not feasible since it is a time-consuming and costly endeavor. Thus, it is important to select ideal samples for WGS that will result in high sequence coverage. The objective of this study was to predict high-quality WGS that can be submitted to GenBank using three post-amplification measurements on viral amplicons: (i) quantitative real-time PCR (qRT-PCR) cycle thresholds (Ct), (ii) DNA concentration, (iii) gel electrophoresis-based images. METHODS: For WGS, SARS-CoV-2 RT-PCR positive nasal swabs were obtained from clinical laboratories across Oahu between August 2020 - December 2022. ARTIC primer pools were utilized to amplify the SARS-CoV-2 genome, and viral amplicons were sequenced using the Illumina MiSeq platform. Sequencing reads were mapped to the original Wuhan sequence, assembled into whole genomes using iVar, and submitted to GenBank. To optimize GenBank submission, a retrospective analysis was done using a cohort of swabs (n=322) collected between August 2020 - November 2021. Ct values, gel image brightness, and DNA concentrations were correlated with genome coverage and GenBank submission, and evaluated using Pearson’s correlation and Cohen's kappa coefficient. RESULTS: Out of the three measurements, DNA concentration showed the strongest correlation with genome coverage and successful GenBank submission. After instituting a DNA concentration cut-off of 1.096 ng/uL for samples proceeding to library preparation, we were able to process fewer samples and concurrently increase the number of submissions to GenBank by 15%. CONCLUSIONS: DNA concentration served as the best criteria for submission of high-quality WGS to GenBank. The optimized WGS protocol will save precious reagents and decrease sequencing time, which will ultimately boost our capacity to conduct genomic surveillance of SARS-CoV-2 in Hawaii.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.06 - Infectious and Immunological Diseases (non-HIV) - RESEARCH ABSTRACT

Grant Support: This research was supported by NIH grants COBRE (P30GM114737), INBRE (3P20GM103466-20S1) and MHRT (T37MD008636).

ANALYSIS OF BINDING VS. NEUTRALIZING SARS-COV-2 ANTIBODIES

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Abstract

PURPOSE: Understanding the antibody kinetics following SARS-CoV-2 infection and COVID-19 vaccinations are essential for delineating the natural history of the disease/vaccination so that we can appropriately adjust public health measures. We previously demonstrated that neutralizing antibody (nAb) responses decline at three- and six-months following the second COVID-19 vaccine dose (PMID: 35605371). Numerous studies have previously investigated binding antibody responses following SARS-CoV-2 infection and COVID-19 vaccination in a variety of cohorts, but without direct comparison to functional antibody responses. METHODS: We compare binding antibody responses to nAb responses using an authentic live-virus assay among individuals with a history of SARS-CoV-2 infection (n=126), COVID-19 vaccination with a history of SARS-CoV-2 natural infection (n=43), and COVID-19 vaccination without a history of SARS-CoV-2 natural infection (n=145) in serum samples collected between July 2020 and September 2022. RESULTS: Side-by-side comparisons, Spearman’s correlation analysis, and Fisher's exact test revealed that binding antibody assays can provide effective qualitative data indicating if an

individual elicits nAb immune response following SARS-CoV-2 infection and/or COVID-19 vaccinations. However, in terms of evaluating the kinetics and longitudinal analysis of waning antibody responses, we found that binding antibodies are not predictive of the nAb response. A strong negative Spearman's correlation was observed for nAb responses (r = -0.25 to -0.59), but not binding antibody responses (r = -0.38 to 0.17) following SARS-CoV-2 infection and/or COVID-19 vaccinations. CONCLUSION: Binding antibody assays are cost-effective and time-efficient mechanisms to evaluate immune responses, however they lack the granularity of nAb assays, and should therefore be cautiously assessed for studying antibody kinetics over the natural history of SARS-CoV-2 infection and/or COVID-19 vaccination.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.06 - Infectious and Immunological Diseases (non-HIV) - RESEARCH ABSTRACT

Grant Support: This research was supported by NIH grants COBRE (P30GM114737), INBRE (3P20GM103466-20S1), MHRT (T37MD008636), OLA Hawaii (U54MD007601) and institutional funds.

ASSESSING HEALTH ASSOCIATED FACTORS THAT IMPACT OVERWEIGHT/OBESITY IN THE BLACK/AFRICAN AMERICAN MALE COMMUNITY

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Abstract

Obesity has been shown to be the foundational cause of many chronic diseases such as Type 2 diabetes, heart disease, and stroke. A study published by the CDC reported that 70.9% of Black/African American (AA) men aged 20 and over were clinically overweight or obese between the years of 2015-2018. The Centers for Disease Control and Prevention (CDC) has also reported that AA men aged 18 and over have a higher prevalence of heart disease death rates, hypertension, diabetes and diabetes death rates, stroke and stroke death rates, and adult obesity in the United States than non-Hispanic white people. Studies have shown that a person's food consumption, surrounding environment, social determinants of health, sleep patterns, physical activity levels, genetics, psychological factors (stress & emotional factors), illnesses, medications, and other variables are all factors that can potentially lead to obesity. Various studies have reported the causes of obesity in general among multiple races; however, these studies have not been normalized for the AA community and have not focused explicitly on the associating factors relating to the overweight/obesity health epidemic in AA men. Additionally, many studies have been conducted to assess the effectiveness of different intervention strategies that address the factors mentioned above, but these studies do not specifically target AA menThe proposed study aims to use a mixed methods approach to examine and assess the role played by various risk factors in the overweight/obese Black/African American male community. The study also endeavors to gain an in-depth understanding of nutritional literacy, belief and attitudes towards healthy eating, environmental factors, perceived stress, and other obesity related risk factors that this population possesses.The increased knowledge that is anticipated to be gained from this study will ultimately serve as a guide to create strategies specifically tailored to reducing the rate of obesity in AA men.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.03 - Diabetes, Obesity, and Metabolic Syndromes - RESEARCH ABSTRACT

SEPSIS RELATED HOSPITALIZATIONS AND MORTALITY IN CALIFORNIA 2009-2018

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Abstract

PURPOSE: Sepsis is a life-threatening condition that results from an exaggerated immune response to an infection and a significant cause of hospitalizations and mortality. We examine the trends and characteristics of sepsis related hospitalizations in California from 2009 to 2018. METHODS: Using data from the California Department of Health Care Access and Information to identify sepsis and septic shock related hospitalizations in California from 2009 to 2018 (ICD-9 codes 995.92, 785.52 and ICD-10 codes R65.20, R65.21), we describe trends over time in sepsis related hospitalizations, in-hospital mortality, length of stay, and costs. We also examine the association of patient

demographics, insurance, and comorbidities on in-hospital mortality using multivariate logistic regression analyses. RESULTS: Our findings include 1.06 million sepsis hospitalizations in California between 2009 and 2018, that increased by 127% from baseline during this time. The change in in-hospital mortality percent was 34.6% to 19.8%, and the average length of stay went from 14.7 days to 10.0 days during this time. The total cost of sepsis-related hospitalizations during this period was $206 billion with a change in annual costs of $13.5 billion to $31.0 billion from 2009 to 2018. Multivariate logistic regression model findings suggested Hispanic race, age ≥ 65, Medicaid, and self-pay insurance, as well as increased Charlson Comorbidity Index were associated with statistically significant higher likelihoods of in-hospital mortality. CONCLUSION: Sepsis is an increasingly significant health burden in California. However, decreasing trends in in-hospital mortality and length of stay suggest hospital care may have improved during 2009-2018. There is a need to better identify causes for these observed trends. In addition, the presence of significant predicators of higher risk for mortality may help identify strategies to improve care to reduce disparities associated with the burden of this condition.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.06 - Infectious and Immunological Diseases (non-HIV) - RESEARCH ABSTRACT

Grant Support: Excellence in Translational Science (NIH-NIMHD grant #U54 MD007598), Urban Health Institute (NIH-NIMHD Grant #5S21MD000103)

WIP1 ACTIVATOR SENSITIZES P53-/- TUMORS TO CHEMO AGENTS

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Abstract

PURPOSE: Significantly higher rates of p53 mutations were identified among the African-American (AA) patients with breast tumors, gastric adenocarcinoma and advanced colorectal cancer. These mutants frequently have oncogenic activities and enhance malignant properties of cancer cells, such as metastasis and drug resistance. The study aimed to identify a novel Wip1 phosphatase activator and evaluate its activity in preclinical models of breast malignancies lacking p53, with a specific focus on addressing health disparities among AA patients with p53-mutant/deletion tumors. METHODS: Cell-based chemical screening was used to identify Wip1 phosphatase activators. The interaction between Wip1 and QGC-8-52 was quantified using surface plasmon resonance (SPR) analysis. The grid-based ligand docking from energetics (GLIDE) software was used to predict the binding model of activator QGC-8-52. The protein-protein interactions were defined by undertaking immunoprecipitation-immunoblotting studies. To substantiate that phospho-T487 of FOXO3a was a target for Wip1, we synthesized human FOXO3a peptide containing phosphorylated T487 and performed an in vitro phosphatase assay. The sensitizing effect of QGC-8-52 on chemotherapeutic drugs in vivo was validated using a xenograft animal model. RESULTS: The Wip1 phosphatase activator QGC-8-52 sensitized cancer cell lines with p53 deletion to chemotherapeutic agents, including those commonly found in AA patients with p53-mutant tumors. The activation of Wip1 in normal cells provided protection from anticancer drug-induced apoptosis by reducing the strength of upstream signaling to p53. DISCUSSION / CONCLUSION: The Wip1 phosphatase activator represents an effective and safe therapeutic strategy for cancers with p53 deletion. Our findings contribute to the understanding of the role of Wip1 in cancer pathogenesis and its potential as a drug target, while also addressing health disparities in AA patients with p53-mutant/deletion tumors.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: This work was supported in part by NIH-NIMHD U54MD007598, NIH/NCI1U54CA14393, U56 CA101599-01; Department-of-Defense Breast Cancer Research Program grant BC043180, NIH/NCATS CTSI UL1TR000124 to J.V. Vadgama, and Accelerating Excellence in Translational Science Pilot Grants G0812D05, NIH/NCI SC1CA200517 and 9 SC1 GM135050-05 to Y. Wu.

ANALYSIS OF A MATHEMATICAL MODEL OF DIABETIC ATHEROSCLEROSIS

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Abstract

PURPOSE: The pathophysiology of diabetic vascular disease is generally understood; it is believed that diabetes increases the risk of atherosclerosis and diabetic patients are twice as likely to have a heart attack or stroke. As atherosclerosis is a cardiovascular condition that affects critical circulatory systems, studying human atheroma poses logistical and ethical problems as access to live atherosclerotic tissue is limited. As a result, the appropriate framework to consider emergent dynamical behavior of this type of disease is mathematical and computational modelling. By analyzing a mathematical model for diabetic atherosclerosis, we aim to test the hypothesis that diabetes increases the risk of atherosclerosis. METHODS: We consider a simplified mathematical model for diabetic atherosclerosis involving Low Density Lipoprotein (LDL), High Density Lipoprotein (HDL), glucose, insulin, free radicals, beta cells, macrophages, and foam cells, which satisfy a system of partial differential equations with a free boundary, the interface between the blood flow and the plaque. We analyze the model by using the theory of partial differential equations and studying the steady solutions and their stability. RESULTS: There exist small radially symmetric stationary solutions to the model and these steady solutions are linearly asymptotically stable when the concentrations of glucose and insulin in the blood satisfy certain condition. CONCLUSIONS: Our analysis shows that the plague will persist due to hyperglycemia even when LDL and HDL are in normal range, hence confirms that diabetes increase the risk of atherosclerosis. African Americans have a substantially higher rate of diabetes and heart disease, the mathematical model is helpful to study the disparity.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.03 - Diabetes, Obesity, and Metabolic Syndromes - RESEARCH ABSTRACT

Grant Support: This work is supported by National Institute of General Medical Sciences of the National Institutes of Health under Award Number UL1GM118973.

ORAL MICROBIOME ASSOCIATED WITH THE RATIOS OF PORPHYROMONAS GINGIVALIS AND STREPTOCOCCUS CRISTATUS

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Abstract

Periodontitis has been recently defined as a dysbiotic disease resulting from imbalanced oral microbiota. The transition of microbial communities from commensal to periodontitis-associated ones likely requires colonization by specific pathogens such as Porphyromonas gingivalis. We previously reported an antagonistic relationship between Streptococcus cristatus and P. gingivalis and identified an anti-P. gingivalis peptide derived S. cristatus that can effectively inhibit biofilm formation, invasion, and gingipain enzymatic activity of P. gingivalis. The present study tent to determine the role of S. cristatus in alterating interactions of P. gingivalis with other oral bacteria in a complex content. We collected dental plaque samples from periodontitis patients and assigned the samples into two groups based on their ratios of S. cristatus and P. gingivalis. we characterized the dental plaque samples using whole metagenome shotgun sequencing and compared oral microbial composition and functional capabilities between groups with high or low S. cristatus and P. gingivalis ratios using advanced biostatistics and bioinformatics techniques. We found that non-redundant genes in the samples with low S. cristatus and P. gingivalis ratios > 1 were much less than those in the samples with high ratio, indicating a higher microbial diversity in the samples with higher S. cristatus and P. gingivalis ratios. We also provide strong evidence of distinct S. cristatus and P. gingivalis ratios existing with different oral microbiotas. Overall, our work highlights the importance of S. cristatus and P. gingivalis ratios in virulence of the entire microbial communities.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.07 - Microbiome - RESEARCH ABSTRACT

Grant Support: MD007586

RACIAL DISPARITY OF ASSOCIATION BETWEEN ASPIRIN USE AND STROKE USING BRFSS DATA

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Abstract

Background: It was well known that African Americans have higher incidence of stroke compare to Non-Hispanic whites. Studies also showed that aspirin use can significantly reduce all-cause mortality rate while the aspirin use may not be associated with stroke or CHD incidence. African Americans were less likely to use aspirin for either preventive purpose or treatment purpose. Overall, the association between aspirin use and stroke was not clear, especially for different race groups. Method: Secondary data analysis using Behavioral Risk factors Surveillance System (BRFSS) to examine the associations between aspirin use and stroke for different race was conducted. Survey logistic regression was used to examine the association of aspirin use and stroke as well as the racial differences. propensity score was adjusted in the logistic model and the association was reexamined. Results: The results showed that self-reported aspirin use was associated with self-reported stroke prevalence. This association exited in both African American and white. For fixed level of aspirin use and age group, the African Americans was 67% more likely to have stroke. For fixed level of stroke and age group, the aspirin use rate in African Americans was not significantly different from white. After adjusting the propensity score, the association between the aspirin use and the stroke was still significant. Conclusion: There was a significant association between aspirin use and stroke. Further analysis needed using longitudinal data to confirm the aspirin effect on stroke.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.02 - Cardiovascular and Cerebrovascular Diseases - RESEARCH ABSTRACT

Grant Support: NA

IN VITRO INVESTIGATION OF PROTEIN DISULFIDE ISOMERASE INHIBITOR FOR TREATMENT OF BREAST CANCER

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Abstract

PURPOSE: Cancer cells require increased protein synthesis and respond to endoplasmic reticulum (ER) stress by activating the unfolded protein response (UPR) which is mediated by ER chaperones. Protein disulfide isomerase (PDI) is the most abundant enzyme in the ER and plays a critical role in protein folding to maintain ER homeostasis. In addition, emerging evidences of the involvement of PDI in cancer cell survival, metastasis and drug-resistance make PDI as an interesting promising target in cancer research. So, this study aims to understand how PDI inhibitor impacts on progression, metastasis and apoptosis of breast cancer, where major health disparities exist. METHODS: TCGA data were analyzed to see mRNA and protein expression of PDI (P4HB) in breast cancer patients, and the association of its expression with survival rates were analyzed by KM plot. In order to see the effect of PDI inhibitor, YCA20, on breast cancer cell proliferation, migration, invasion, and apoptosis, we performed cell viability assay, wound healing assay, invasion assay, Annexin V apoptosis assay, morphological analysis, and western blot analysis in MDA-MB-231 cells. RESULTS: We confirmed that PDI expression is upregulated in BRCA samples and associated with poor prognosis in breast cancer patients. YCA20 showed strong cytotoxicity on breast cancer cells (3-8 μM of IC50) with no cytotoxicity on normal cells. Also, YCA20 suppressed migration and invasion in MDA-MB-231 cells. YCA20 induced apoptosis that is supported by increased proportion of apoptotic cells and morphological changes of the cells. CONCLUSION: YCA20 is identified as promising candidate for further development as it suppresses proliferation, migration/invasion, and induces apoptosis of breast cancer cells. However, further investigations should be conducted for successful development of this compound by elucidating exact mechanism on signaling pathways related to migration/invasion and apoptosis, and further in vivo investigation.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: This research was supported by NIH-NIMHD under award number U54D007598 – AXIS center.

THE INFLUENCE OF SOCIOECONOMIC STATUS ON THE BURDEN OF HOSPITALIZATION DUE TO CHRONIC DISEASES AMONG RESIDENTS OF THE DISTRICT OF COLUMBIA

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Abstract

PURPOSE Our study investigated the influence of socioeconomic status (SES) on District of Columbia (D.C.) residents, highlighting the impact underserved populations have on hospitalizations, ultimately influencing the staggering healthcare cost in D.C. METHODS DC inpatient data were obtained from the Healthcare Cost and Utilization Project (HCUP) for 2017, 2018, and 2019. Proportions were compared within and between groups using chi-square tests. We merged the HCUP charges datasets corresponding to the selected data cycles and calculated the total charges per patient. The charges information was further analyzed by race and gender and by gender, race, and payors. RESULTS The prevalence of diabetes, cardiovascular diseases, and renal diseases among female Blacks versus among female Whites was 3.5% vs. 17.1%, 4.4% vs. 12.9%, and 3.4% vs. 18.0%. For their respective male counterparts, it was as follows: 9.0% vs. 18.2%, 17.5% vs. 17.6%, and 10.3% vs. 23.6%. Also, the disease distributions were equally striking. For example, the distribution of diabetes, cardiovascular diseases, and renal diseases between female Whites and Blacks was 4.1% vs. 77.1%, 7.0% vs. 78.2%, and 4.0% vs. 81.1%, respectively. Similarly, the results for males were 7.7% vs. 71.6%, 15.2% vs. 69.9, and 7.3 vs. 76.8. Of the 96375 female inpatients, 66% were Blacks accounting for 74% of the related charges. 17% were Whites, accounting for 14% of associated charges. Out of the 66912 male inpatients, 68% were Blacks accounting for 72% of the related charges, with 15% being Whites, accounting for 15%. DISCUSSION/CONCLUSION The Back population exhibits a high distribution of respective chronic diseases in the inpatient population. However, the ratio of Blacks and Whites in D.C. is approximately 1:1. The results could be associated with the poor socioeconomic conditions among Blacks. The high number of hospitalizations among Blacks influenced the district's cost of healthcare.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.03 - Diabetes, Obesity, and Metabolic Syndromes - RESEARCH ABSTRACT

Grant Support: This work is supported by Howard University Research Centers for Minority Institutions (HU-RCMI) with a research grant from the National Institute of Health – National Institute on Minority Health and Health Disparities (NIH-NIMHD) (U54MD007597).

EXPLORE THE CONNECTION BETWEEN HEALTH LITERACY, HOOKUP CULTURE AND HIV PREVENTION STRATEGY AMONG HBCU STUDENTS (PROJECT IN PROGRESS)

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Abstract

PURPOSE: Centuries of structural racism, discrimination and stigmatization has left persistent health disparity in the US. In the case of HIV, Black American accounts for more than 40% of new HIV infections (CDC, 2019). Risk reduction strategies such as testing and PrEP have lower rate of adoption among black people. However, existing research has been predominantly focused on condom use. The current study seeks to review the perceived barriers of all risk reduction strategies and put them in the cultural and psychological context of hookup culture and health information consumption. This study would build the foundation for intervention for on campus students. RQ1: What is the information/skill gap on HIV risk reduction? RQ2: What are the perceived barriers in implementing each HIV risk reduction strategies? RQ3: What is the connection between hookup culture acceptance and HIV risk reduction strategies. METHOD: The study will utilize community-based participatory research methods to conduct in-person focus group with (total n=18-24) Black or African American young adults from an HBCU. The following questions will be covered in the focus groups: o Health literacy and information source on HIV risk reduction. o Perceived relevance and barriers of HIV testing and prevention. o Perceived connection between hookup culture(social norm) and

HIV risk reduction for self and other. Expected Results: Focus groups scheduled at the last April-May 2023. Besides answering the research questions, we also expect to see H1: Hookup culture is negatively associated with HIV testing and PrEP. H2: Hookup culture is positively associated with the condom use and PEP. DISCUSSION: HIV risk reduction is beyond safe sex. This study will provide valuable insights for HIV reduction program/campaign design to overcome barriers in HIV testing and prevention.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.05 - HIV and AIDS - RESEARCH ABSTRACT

Grant Support: NCCU IMPLEMENTATION Science Fellows (sponsored by The Elsevier Foundation and ViiV Health Care).

NOVEL PYRIMIDINE NUCLEOSIDES: DESIGN, SYNTHESIS, IN VITRO EVALUATION AGAINST MIAPACA-2 CELLS

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Abstract

Purpose: Pancreatic cancer is a deadly disease that is mostly diagnosed at an incurable stage. The American Cancer Society estimated an incidence of 64,050 cases of pancreatic cancer for the year 2023 with 50,550 deaths making pancreatic cancer the third most deadly cancer in the United States. Chemotherapy is the preferred standard of treatment for pancreatic cancer, however; high systemic instability and drug resistance of chemotherapeutic drugs have rendered them less effective. The objective of the study was to develop a new compound with improved stability and enhanced therapeutic effect with less or no side effects for the treatment of pancreatic cancer. Method: The fluoropyrimidine nucleoside analogs were designed and synthesized through chemical modification of 5-Fluorouracil (5-FU) by modifying: 1) position 1 with a tetrahydrofuran ring, and 2) position 4 with a carbamate chain. The analogs were characterized using nuclear magnetic resonance (NMR), micro-elemental analysis, and purity determined using high-performance liquid chromatography (HPLC). Results: The newly synthesized fluoropyrimidine nucleoside analogs demonstrated significant chemotherapeutic efficacy against pancreatic cancer MiaPaCa-2 cells with remarkably low half-maximal inhibitory concentration (IC50) values (1.5-to-5.6-fold high) compared with 5-FU. The IC50 values of 48 hours of treatment of the analogs were: 7.69 ± 1.4 µm (XYZ-I-71), 6.27 ±1.2 µm (XYZ-I-73), 2.15 ±1.3 µm (XYZ-I-79) and 2.63 ±1.1 µm (XYZ-I-113) compared with 12.1 ±1.3 µm for 5-FU. The XYZ-I-79 and XYZ-I-113 appeared to be the most effective anticancer analogs against MiaPaCa-2 cells compared with 5-FU. The percent purity of the analogs was over 99.6. Conclusion: The XYZ-I-79 and XYZ-I-113 analogs may have the potential to be lead candidates for further optimization and testing on various pancreatic cancer cell lines and normal pancreatic cells.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: This research is financially supported by the National Institute of Health (NIH) National Institute on Minority Health and Health Disparities (NIMHD) grant U54MD007582

THE PROGNOSTIC VALUE OF TOMM40 AND ITS ROLE IN BREAST CANCER RISK IN AFRICAN AMERICAN WOMEN

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Abstract

Purpose: TOMM40 is a channel-forming subunit of translocase, essential for the movement of proteins into the mitochondria. This study aimed to investigate the prognostic value of TOMM40 across 33 cancer types. Methods: We used bioinformatics methods to explore the potential oncogenic roles of TOMM40 and evaluated its expression in different cancers. Additionally, TOMM40 expression in normal and malignant breast tissues was measured by IHC. Cell viability wound healing and transwell assays were used to detect the effects of TOMM40 on the biological behaviors of MDA-MB-231 cells. Results: Our study revealed that TOMM40 was expressed in most types of cancers, with the highest levels observed in Testicular Germ Cell Tumors (TGCT) and the lowest in Kidney renal clear cell carcinoma (KIRC). TOMM40

expression was significantly higher in AA breast cancer and TNBC compared to other breast cancer subtypes. It was associated with low overall survival (OS) and disease-free interval (DFI) of BC patients. Knockdown of TOMM40 significantly altered cell biological behavior, resulting in decreased proliferation, migration, and invasion capabilities of MDA-MB-231 cells. Discussion/Conclusion: Our results suggest that TOMM40 is a promising candidate biomarker that plays a role in the occurrence, development, and prognosis of pan-cancer, particularly in TNBC and BC risk in AA women. High expression of TOMM40 in TNBC is associated with the high mortality rate of AA women, thus representing a potential therapeutic target and biomarker for BC risk. Our study highlights the importance of further investigating the mechanisms underlying the association between TOMM40 and BC risk in AA women.

Category: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: GRANT SUPPORT: This work was supported in part by NIH-NIMHD U54MD007598, NIH/NCI1U54CA14393, U56 CA101599-01; Department-of-Defense Breast Cancer Research Program grant BC043180, NIH/NCATS CTSI UL1TR000124 to J.V. Vadgama; Accelerating Excellence in Translational Science Pilot Grants G0812D05, NIH/NCI SC1CA200

2.0 - BEHAVIORAL AND SOCIAL DETERMINANTS OF HEALTH

NEIGHBORHOOD VULNERABILITY AND STRESS IN AFRICAN AMERICANS

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Abstract

PURPOSE: Social determinants of health (SDOH) disproportionately burden underserved populations, who tend to live in neighborhoods that are more socially vulnerable. The social vulnerability index (SVI) highlights the potential adverse effects on communities caused by external stressors on human health. The aim of this study was to associate SVI of participants' neighborhoods with stress indicators. METHODS: A study of 126 adult Black men and women was conducted in North Carolina counties. Demographics and perceived stress (PS) were self-reported and participants' home addresses were geocoded. SVI calculated at the census tract level was attributed to their residence. Spearman correlation sought relationship between SVI as neighborhood variable; cortisol and NPY levels as biomarkers related to stress and inflammation. Pearson Chi-square test was used to identify dependency between SVI and PS. Significance was kept at 5%. RESULTS: SVI showed positive significance with NPY ($p<0.001$), remaining when stratifying by males ($p=.011$), females ($p=.006$) and normal ($p=.045$) and overweight ($p=.007$) BMI strata. Cortisol showed to be negatively correlated to SVI overall ($p=.003$), also significant for females ($p=.006$) and those in the normal weight strata ($p=.021$). SVI was positively correlated with PS ($p=.009$), especially for obese participants ($p=.005$). We expected that higher SVI would positively correlate with NPY, cortisol, and PS, since vulnerable communities may be at a higher risk for external stressors. However, studies have demonstrated that adverse life events and low economic status associated with chronic stress adversely affects cortisol levels. Coping strategies may be a reason for lower cortisol levels when SVI is higher. CONCLUSION: Neighborhood vulnerability is associated with PS and hormones that may drive onset and progression of chronic disease. Interventions should focus on the built and social environments to lower health disparities.

Category: 2.0 - Behavioral and Social Determinants of Health - 2.04 - Social Determinants of Health - RESEARCH ABSTRACT

Grant Support: NIH U54MD012392

STUDYING HOW INDIVIDUALS WHO EXPRESS THE FEELING OF LONELINESS IN AN ONLINE LONELINESS FORUM COMMUNICATE IN A NON-LONELINESS FORUM

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Abstract

PURPOSE: Loneliness is a public health concern, and increasingly, individuals experiencing loneliness are seeking support on online forums, some of which focus on discussions around loneliness (loneliness forums). Some of these individuals may also seek support around loneliness on online forums not related to loneliness or well-being (non-loneliness forums).This study aims to explore how users who express the feeling of loneliness and seek support around loneliness on an online loneliness forum communicate in an online non-loneliness forum. METHODS: A total of 2401 users who expressed loneliness in posts published on a loneliness forum on Reddit and had published posts in a non-loneliness forum were identified. Using latent Dirichlet allocation (a natural language processing algorithm) and the Linguistic Inquiry and Word Count (a psycholinguistic dictionary) the language use differences in posts published in the non-loneliness forum by these users compared to a control group of users who did not belong to any loneliness forum on Reddit were determined. RESULTS: It was found that in posts published in the non-loneliness forum, users who expressed loneliness tend to use more words associated with the Linguistic Inquiry and Word Count categories on sadness (Cohen d=0.10) and seeking to socialize (Cohen d=0.114). Also, they tend to publish posts related to latent Dirichlet allocation topics such as relationships (Cohen d=0.105) and family and friends and mental health (Cohen d=0.10). CONCLUSIONS: There are clear distinctions in language use in non-loneliness forum posts by users who express loneliness compared to a control group of users. These findings can help with the design and implementation of online interventions around loneliness.

Category: 2.0 - Behavioral and Social Determinants of Health - 2.01 - Behavioral and Mental Health - RESEARCH ABSTRACT

Grant Support: N/A

RECOVERY BASED RELAPSE PREVENTION: ACCEPTABILITY & FEASIBILITY

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Abstract

PURPOSE The study sought to obtain preliminary outcomes for a novel group-based relapse prevention approach for addictive disorders, titled Recovery Based Relapse Prevention (RBRP). The RBRP approach is innovative because it seeks to address disparities that limit treatment access for individuals from underserved populations, including ethnic and racial minorities and those from disadvantaged communities. The primary goals of the study were to identify effective treatment components, assess group members' experiences while participating in the group, and to estimate an effect size for planning future studies. METHODS A single-group pilot study with 60 participants was conducted to assess the acceptability and feasibility of RBRP. Participants were encouraged to attend group sessions weekly and were assessed at 4- and 8-weeks following enrollment using the BOUTS relapse risk measure as well as additional quantitative measures (e.g., Acceptability of Intervention Measure [AIM], Intervention Appropriateness Measure [IAM], and Feasibility of Intervention Measure [FIM] and qualitative interviews. RESULTS Preliminary data suggests that participants find the RBRP treatment to be both acceptable and feasible. A linear mixed model with restricted maximum likelihood (REML) estimation was used to examine differences in BOUTS total scores across RBRP groups. The main effect for RBRP group was statistically significant, and follow-up analyses indicated that participants' BOUTS scores were lower during all RBRP groups following their first. The largest reduction in BOUTS scores occurred between the 1st and 4th group sessions with an effect size of dz = 1.07 (a large effect size). DISCUSSION / CONCLUSION Results of the study show that the RBRP approach may be a viable treatment for reducing relapse risk among underserved individuals with addictive disorders and is worthy of further study.

Category: 2.0 - Behavioral and Social Determinants of Health - 2.01 - Behavioral and Mental Health - RESEARCH ABSTRACT

Grant Support: NIH Administrative Supplement Grant #: 3U54MD015929 - 02W1 ($100,000 TC)

MINORITIZED COMMUNITY ENGAGEMENT & COVID-19 CONTACT TRACING

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IA DOHERTY; W Pilkington; LG Brown; T Locklear; KS Kimbro
North Carolina Central University; (IAD, WP, LB, TL, KSK)

Abstract

PURPOSE: Before the FDA approved COVID-19 vaccines, case identification and contact tracing was a key mitigation strategy for suppressing COVID-19 spread. This study characterized the experiences and opinions of people attending COVID-19 testing events in 9 predominately rural NC counties. Because of historically valid distrust of researchers and the medical system among Black populations, we hypothesized that contact tracing acceptability and readiness would be lower among Black than White participants. METHODS: The Advanced Center for COVID-19 Related Disparities (ACCORD) at North Carolina Central University (NCCU) hosted COVID-19 testing events between September – December, 2020 (before vaccine availability). Respondents completed surveys and received items with NCCU logos. Contact tracing was assessed with questions about speaking to a contact tracer and whether they would disclose names of some or all of their contacts. RESULTS: Of 406 participants, 61%, 26%, and 18% were Black, White, and Latino/a, respectively. Most were women (66%), >age 60(41%), with an annual income <$40,000 (79%). The majority reported no COVID-19 testing sites in their community (76%). Most would speak to a contact tracer (80.5%) and 62% reported willingness to disclose names of all or some of their contacts including 67% and 65% of Black and White participants. Other factors associated with disclosure included barriers to COVID-19 testing (e.g. lack of sites, transportation) and vaccine safety concerns. DISCUSSION: Contrary to our hypothesis, disclosure willingness prevalence did not differ between Black and White participants. We are an HBCU inherently trusted by minoritized communities; we provided testing in COVID-19 testing deserts. Our approach promoted community engagement around the pandemic as shown with high prevalence of contact tracing acceptability. Broadly assuming that Black populations would distrust and reticient to public health efforts is misguided and stigmatizing.

Category: 2.0 - Behavioral and Social Determinants of Health - 2.04 - Social Determinants of Health - RESEARCH ABSTRACT

Grant Support: North Carolina Policy Collaboratory at the University of North Carolina at Chapel Hill and North Carolina General Assembly. Grant U54MD012392 from the National Institutes of Health.

DECISION-MAKING PROCESSES AMONG AFRICAN AMERICANS FOR COVID-19 VACCINATION

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Abstract

PURPOSE African Americans exhibited higher COVID-19 vaccination hesitancy rates compared to Whites in early pandemic stages, and geographical pockets of hesitancy continue to exist. Little is known on the processes used in COVID-19 vaccination decision-making. Among vaccinated and unvaccinated African Americans, we aim to: 1) describe determinants of COVID-19 vaccine hesitancy; 2) discuss decision-making processes used for vaccination; and 3) describe the navigation of the infodemic on COVID-19 vaccination. METHODS After forming a community-academic partnership, we conducted a multi-method (interviews and surveys) study among 30 African Americans (n=14 unvaccinated; n=16 vaccinated). Data collection occurred between October 2021 and January 2022. Participants were recruited via community driven approaches. Survey data were analyzed via bivariate analysis; and qualitative data were analyzed via thematic analysis. RESULTS The top vaccine concern among those unvaccinated was being too new (92%), and the top concern among the vaccinated was the vaccine could cause serious health problems (69%). Top motivator among those vaccinated was reading and listening to a news story discussing COVID-19 vaccine trials (43.8%). Themes from semi-structured interview data were: (1) COVID-19 vaccination hesitancy exists on a continuum; (2) varied decision-making processes for COVID- 19 vaccination; (3) motivators among vaccinated individuals; (4) barriers among unvaccinated individuals; (5) retrieving and navigating vaccine information within the COVID-19 infodemic; and (6) parent perspectives on child vaccination. DISCUSSION / CONCLUSION Our findings suggest that vaccinated and unvaccinated participants had similar and dissimilar vaccine concerns and perspectives in decision-making processes as demonstrated in the Decision-making Processes for the COVID-19 vaccination (DePC) model. Several methods were used to navigate the COVID-19 infodemic. Based on these findings, future studies

Category: 2.0 - Behavioral and Social Determinants of Health - 2.01 - Behavioral and Mental Health - RESEARCH ABSTRACT

Grant Support: This work is supported by National Institute on Minority Health and Health Disparities (#3U54MD007586-34S7).

PRELIMINARY FINDINGS OF A RANDOMIZED BEHAVIORAL TRIAL TO PROMOTE COVID-19 BOOSTER VACCINATION AMONG A PUERTO RICAN COMMUNITY: THE PUERTO RICO VACCINE UPTAKE STUDY (PR-COVACUPS)

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University of Puerto Rico Medical Sciences Campus (AGS, CMP, GDTI, KMJ, CRC, AFM, CRS, ICC, VCL); University of Puerto Rico Comprehensive Cancer Center (KMJ, VCL); Rollins School of Public Health at Emory University (ALC)

Abstract

PURPOSE: As of March 24, 2023, 44.1% of the eligible population have not received the vaccine booster for COVID-19, as reported by the Puerto Rico Immunization Registry System. This highlights the ongoing challenges and urgency to target booster uptake distribution in the archipelago. The Puerto Rico COVID-19 Vaccine Uptake Study (PR-COVACUPS) will evaluate the efficacy of an educational intervention to reduce COVID-19 vaccine booster hesitancy in a vulnerable and socioeconomically disadvantaged population group in Puerto Rico. METHODS: A two-group randomized-controlled trial recruited adults 21 years or older, who have not received the booster vaccine, at the University of Puerto Rico Medical Sciences Campus health clinics. A web-based program randomly assigned participants to the intervention and control groups. The intervention group receives a low-literacy educational toolkit, delivered by a lay health worker. This toolkit addresses vaccine hesitancy, misinformation, and distrust; it was complemented with access to a website containing educational videos, whereas the control group receives usual care. The primary endpoint is booster uptake at two weeks and 2-or-4-months after the baseline interview. Barriers against COVID-19 booster uptake are also collected. RESULTS: 386 participants were randomized into the intervention (n=192) and control (n=194) groups. Of these, 342 (88.6%) have completed the 2-or-4-month follow-up calls. Preliminary evidence indicates that 8.81% of intervention participants and 6.51% controls have received the COVID-19 booster uptake. Barriers against booster uptake include access to vaccines, health concerns, personal beliefs, and vaccine development concerns. DISCUSSION/CONCLUSION: The educational intervention may provide a framework for targeting the public health urgency to encourage COVID-19 booster uptake. If shown effective, this study will set the stage for future behavioral trials for COVID-19 vaccination as changes will continue to emerge.

Category: 2.0 - Behavioral and Social Determinants of Health - 2.01 - Behavioral and Mental Health - RESEARCH ABSTRACT

Grant Support: This research is supported by NIH Grant 3U54MD007600-35S.

LOVING THE LIFE YOU'RE IN: A PILOT STUDY EXPLORING SATISFACTION WITH LIVING ARRANGEMENTS AND QUALITY OF LIFE AMONG OLDER AFRICAN AMERICANS.

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Xavier University of Louisiana (1), University of Minnesota (2)

Abstract

Background: Few studies have examined the impact of living arrangement on self-reported quality of life among older African Americans. This pilot study explores linkages between satisfaction with current living arrangement and quality of life (QoL) among this population. Methods: A convenience sample of participants 55 years of age and older was surveyed using the Older Persons Quality of Life Survey (OPQOL) with additional questions related to current living arrangements and demographic variables. Data analysis included descriptive statistics with means for continuous variables and percentages for categorical variables. Chi-square examined the association between satisfaction with current living arrangement and total OPQOL score. Results: 132 participants provided complete data for inclusion in analyses. Living environments included: home they owned-66%, a rented home-29%, and assisted-living or other housing-5%. 27% of participants were married, 34% widowed, and 36% single or divorced. 70% of participants were retired. 44% were living alone, 55% lived with one or more persons. Average total OPQOL score was 136.95 (range 67-169). 119 respondents (90%) expressed satisfaction with their current living arrangement. 21% of this group indicated they would choose a different arrangement if given the opportunity. There was a significant association between satisfaction with current living arrangement and OPQOL score (X2=11.513; p = 0.003). Persons expressing satisfaction with their current living arrangement also had higher quality of life scores. Conclusions: Despite resources made available since

the 1965-Older Americans Act, older African-Americans still face challenges to successful aging-in-place. Understanding living choices will inform policies to improve aging-in-place options for African Americans.

Category: 2.0 - Behavioral and Social Determinants of Health - 2.04 - Social Determinants of Health - RESEARCH ABSTRACT

Grant Support: NIH NIMHD-3U54MD007595-13S5

PREDICTORS OF COVID-19 VACCINE HESITANCY

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Morgan State University

Abstract

PURPOSE The availability of Covid-19 vaccine intervention was accompanied by uncertainty about its safety and efficacy for a proportion of the general population. For marginalized communities in the United States, medical distrust has been persistently reported and is hypothesized as due to negative consequences of disparities in social determinants of health. This study aimed to test the hypothesis that healthcare distrust and perceived discrimination predict Covid-19 vaccine hesitancy. METHODS A convenience sample of social media users residing in the United States were surveyed between December 2020 and May 2021. Participants answered demographic questions and survey items that measured perceived lifetime discrimination, frequency of daily discrimination experienced during the pandemic, healthcare system distrust, and vaccine hesitancy. RESULTS/EXPECTED RESULTS Statistical Analysis revealed that perceived lifetime discrimination and daily discrimination experienced during the pandemic significantly correlated with healthcare distrust [r(100)=.411, p<001] and [r(100)=.496 p<.001], respectively. Vaccine hesitant participants, (53%) participants had greater levels of health care system distrust than vaccine accepting participants [t (91.601) =-3.032, p=.003]. Black men reported the highest level of lifetime discrimination and greater levels of distrust compared to other demographic groups but did not differ from others in vaccine hesitancy. DISCUSSION/CONCLUSION These findings suggest a need for public health institutions in the United States to build a better level of trust with marginalized populations, particularly black males who might be disproportionately vulnerable to COVID-19 and other health complications.

Category: 2.0 - Behavioral and Social Determinants of Health - 2.04 - Social Determinants of Health - RESEARCH ABSTRACT

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CV19 DEATHS: WORKPLACE EXPOSURE & POOR ACCESS TO ICU BEDS?

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Abstract

PURPOSE The purpose of this project was to model the impact of COVID-19 in urban counties that were most impacted during the pandemic's first wave and identify local geographic factors most relevant to disparities in mortality incidence. METHODS We tracked the diffusion of COVID-19 cases and deaths to identify neighborhood effects using available small areas (zip codes, towns, neighborhoods). ArcGIS software (ESRI, Inc) was used to create travel time models from home addresses of each person who died from CV-19 to the closest facility with ICU beds. Descriptive statistics and regression modelling assessed and quantified relationships between social determinants and COVID-19 mortality by race and ethnicity. RESULTS Local factors that influenced the transmission and associated mortality from COVID-19 included Phen-X toolkit ID# 11901 (concentrated race and ethnicity) (.001) and ID# 211403 (concentrated poverty) (.001). Other significant variables were 1) percent of households with no vehicle (.001) and 2) percent of the workforce employed in Healthcare Support and Tech (USDOL category #SOC 31.000) (.001). In a Cook County, Illinois case study we found that African Americans were more concentrated in US DOL category #SOC 31.000 (.001) and that in the Chicago urbanized area, (City of Chicago and adjacent zip codes)

Latinos and African Americans had spatial access to fewer ICU beds (.001) when the pandemic began. DISCUSSION / CONCLUSION Our findings show how previously existing neighborhood patterns of racial segregation and other characteristics in local environments increased potential exposure to COVID-19 while at the same time limiting access to life saving interventions. This compound effect led to early disparities in who died from COVID-19. As the epidemic moved into more mainstream populations treatment paradigms improved and mortality rates dropped. New health policies should shield vulnerable groups from suffering from concentrated effects in future pandemics.

Category: 2.0 - Behavioral and Social Determinants of Health - 2.04 - Social Determinants of Health - RESEARCH ABSTRACT

Grant Support: Accelerating Excellence in Translational Sciences (AXIS) Admin Supplement 3U54MD007598-12S6

PARENTS JUST DON'T UNDERSTAND! PARENTAL AWARENESS OF CHILDREN MENTAL HEALTH

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Abstract

PURPOSE After the COVID-19 pandemic there are ever-growing concerns about mental health disorders in children, as evidenced by the increasing amount of published literature. There seems to be a gap in demonstrating if and how parents relate to their children's mental health status. We hypothesize that parents may not be aware of their children's mental health or its extent. The objective of this study is to determine if parents are failing to identify mental health disorders signs and symptoms in their children. Our goal is to analyze the results of a mental health screening instrument administered to parent-child dyads. We aim to explore the need for children's mental health literacy in parents. METHODS The screen for Screen for Child Anxiety Related Disorders (SCARED) was administered to parents and children, in their respective versions, before initiating a socio-emotional learning program. Scores equal or greater than 25 points are indicative of the presence of an anxiety disorder. We then compared the results within the dyads to categorize them between same results or different results. Different results are those where one of the members of the dyad scored at or above 25 points while the other scored below 25 points. We found that 41% of the dyads had different results. DISCUSSION / CONCLUSION Our results show that parents may not be aware of their children's mental health. This places children at increased risk of mental health disorders being not diagnosed and left untreated or being late diagnosed with lasting consequences for the child and their family.

Category: 2.0 - Behavioral and Social Determinants of Health - 2.04 - Social Determinants of Health - RESEARCH ABSTRACT

Grant Support: R25 GM137368

EFFECTS OF EXPOSURE TO VIOLENCE ON TELOMERE LENGTH OPERATE THROUGH DIFFERENT PATHWAYS IN YOUNG AFRICAN AMERICAN ADULT FEMALES AND MALES

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Abstract

OBJECTIVE: Exposure to violence (ETV), an environmental stressor, impacts human health and can have long-term biological effects, including shorter telomere length (TL). The relationship between TL, environmental stressors (ETV and policing), and depression have been studied, but not yet extensively in young African American adults (YAAA). This study examines relationships between environmental stressors and depression on TL, measured by a quantitative PCR assay, in YAAA in Washington DC. METHOD: We analyzed 98 saliva samples of 18 to 25-year-old AA men (48) and women (50). Participants who reported either ETV or no ETV on several measures of ETV were selected. Correlations were calculated between TL, depression, and ETV measures. Stepwise regressions examined the effects of ETV variables substance use, and depression on TL, controlling for age, gender, receiving welfare or public assistance, age at first substance use, and BMI. RESULTS: In males TL is negatively associated with depression; police interactions; physical violence; community violence; threat

of violence and witnessing violence. Females' attitude towards police was positively correlated with TL. In stepwise regressions for men, police interaction (β = .657) and the threat of violence (β = .260) had strong effects on depression, which has a large negative effect (β = -.464) on TL. For women community violence (β = .224), and ages at first alcohol (β = .278) and tobacco (β = .567) all increase the age of first marijuana use, which in turn was associated with longer TL (β = .352). CONCLUSION: The regression shows the effects of ETV on TL differ for males and females and operate through different pathways. For men, police interaction and threats of violence affect TL through depression, and community violence affected TL through age of first marijuana use for women. The findings point to important sex differences in the psychosocial internalization of environmental stressors among YAAA.

Category: 2.0 - Behavioral and Social Determinants of Health - 2.04 - Social Determinants of Health4.01 - Clinical and Translational Science Research - RESEARCH ABSTRACT

Grant Support: This project was funded in whole or in part with U.S. Government funds from the following National Institutes of Health (NIH): the National Institute on Minority Health and Health Disparities under grant #5P20MD000198. It was also supported in part with NIH "Re-Engineering the Clinical Research Enterprise," Grant # UL1TR000101 previously UL1RR031975. The telomere analysis was funded by Howard University Office of Research.

PERCEPTIONS OF TRAUMA AAD VIOLENNE INFORMED CARE

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Abstract

PURPOSE: Black women in Nashville suffer disproportionately from intimate partner violence (IPV). Intersectionality approaches proposed in this study may improve clinic-based IPV services for Black women by addressing structural and political factors like racial inequity in the distribution of resources that marginalize the needs of Black IPV survivors. Trauma informed care is an evidence-based practice recommended for IPV survivors, therefore the goal of this study is to adapt, implement and evaluate a trauma and violence informed care (TVIC) intervention designed for Black women in middle Tennessee. METHODS: Aim 1) Engage a stakeholder Committee of Patients/Providers and Experts to adapt a TVIC intervention for Black women and their healthcare providers at Meharry Medical College. Aim 2) Implement and prospectively evaluate the adapted TVIC intervention at the healthcare provider-level at Meharry. Aim 3) Implement and evaluate the adapted TVIC intervention at the patient- and provider-level to determine trauma informed IPV screening, brief interventions and referrals to treatment through a non-randomized pragmatic trial at Meharry Medical College (intervention site) and Matthew Walker Comprehensive Health Center (usual care site). EXPECTED RESULTS: Hypothesis 1) The Committee of Patients/Providers and Experts will find the adapted TVIC intervention to be acceptable, appropriate and feasible. Hypothesis 2) Healthcare providers' knowledge, attitudes and practices will increase with TVIC training. Hypothesis 3) In intervention versus usual care clinics, we anticipate increases in a) patients' receipt of IPV screening, trauma and mental health services, and b) providers' knowledge, attitudes and practices to address IPV and trauma. CONCLUSIONS: This study should add to the existing evidence that TVIC improves healthcare among patients, and clinic-based practices among providers in an understudied population.

Category: 2.0 - Behavioral and Social Determinants of Health - 2.06 - Violence and Crime - CLINICAL PRACTICE ABSTRACT

Grant Support: This study was funded by a grant from the NIMHD (U54MD007586).

EXPERIENCES OF TYPE 2 DIABETES PATIENTS DURING THE COVID-19 PANDEMIC

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Abstract

PURPOSE The effects of the COVID-19 pandemic extend beyond the virus itself and may threaten to exacerbate existing health disparities among marginalized and medically vulnerable populations, such individuals from minoritized ethnoracial groups and those with Type 2

Diabetes (T2D). The purpose of this mixed-methods study was to examine factors that influenced T2D management among patients seeking care from a large federally qualified health center (FQHC). METHODS Electronic health records were extracted for all adult T2D patients of Family Health Centers of San Diego, Inc., the largest FQHC in Southern California to examine T2D management, defined as glycosylated hemoglobin A1C levels (A1C), throughout the first year of the pandemic. Interrupted time series analyses was used to determine whether A1C levels increased during the pandemic and multinomial logistic regression was used to identify sociodemographic and health factors that predicted A1C change during the pandemic. One-on-one interviews were conducted with patients about their experiences managing their condition. RESULTS Quantitative analysis of 15,860 patient records (58.0% Hispanic/Latinx; 83.7%< federal poverty line) showed A1C levels did not significantly change among the entire T2D patient population in the first year of the pandemic; however, younger patients and those who completed fewer healthcare visits were more likely to experience significant declines in A1C. Qualitative analysis of 26 patient interviews (84.6% Latinx; 76.9% female) highlighted the social challenges faced by participants during the pandemic that may have impacted their A1C levels, such as difficulties finding healthy food and fear of contracting COVID-19. DISCUSSION Many patients maintained their A1C levels during the pandemic, highlighting the success of the FQHC in ensuring high-quality care remained accessible and the resourcefulness of the patients. However, many described increased social challenges resulting from the pandemic

Category: 2.0 - Behavioral and Social Determinants of Health - 1.03 - Diabetes, Obesity, and Metabolic Syndromes2.04 - Social Determinants of Health - RESEARCH ABSTRACT

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DECREASING VACCINE HESITANCY THROUGH A COMMUNITY PARTNERSHIP

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Abstract

PURPOSE The goal of this community partnership was to examine the social determinants that may influence COVID-19 vaccination among at risk populations in the medically underserved area of Gadsden County, Florida. Aim 1 examined the social and behavioral barriers to COVID-19 vaccination among Black and Hispanic populations and Aim 2 implemented education and awareness about the benefits of COVID-19 vaccination, especially among vulnerable populations. METHODS A survey instrument was constructed to measure perceptions of the underlying causes of the racial disparities in the rates of COVID-19 cases and deaths, and reluctance to be vaccinated. N= 680. COVID -19 education was implemented at local churches, health fairs, pop-up vaccinations sites and food distribution events by community health ambassadors. The ambassadors were trained by health professionals, the local health department and health educators. RESULTS Almost 85% (N=588) said that they'd been vaccinated at least once and 44.7% of those surveyed had received a booster vaccination. At present, Gadsden County has the third highest SARS-CoV-2 infection rate in the state of Florida. Health disparities in chronic diseases such as diabetes among the largely rural communities that are less likely to have access to quality healthcare increases the risk of dying from COVID-19. Although 39% indicated a belief that Black people are more likely to suffer more severe outcomes than Whites, the majority (59.2%) believe that chronic health conditions play a role in determining who will have worse outcomes. CONCLUSION Since most of the respondents are not well-protected, subsequent community education emphasized the benefits of boosters. To date, more than 13 health education events have been implemented to provide health care assessments, A1c and glucose screenings, blood pressure readings, tobacco cessation referrals, and vaccinations in the urban and rural areas. Two COVID-19 consultants and two medical assistants assisted

Category: 2.0 - Behavioral and Social Determinants of Health - 2.04 - Social Determinants of Health - RESEARCH ABSTRACT

Grant Support: Grant #: NIH/NIMHHD, Award # 3U54MD007582-36S1

BLACK BODIES MATTER: AN EXAMINATION OF DIABETES, PERIPHERAL ARTERY DISEASE AND LIMB AMPUTATION DISPARITIES IN BLACK AND WHITE PERSONS USING CMS GEOGRAPHIC VARIATION PUBLIC USE FILES

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Abstract

Research Objective: African Americans are at high-risk for limb amputation as a result of Type 2 diabetes and subsequent peripheral artery disease with lower limb ischemia. Black patients represent 14.7% of the 30 million Americans with diabetes. Health care utilization data indicates that limb amputations are nearly two times higher among Blacks compared with non-Hispanic whites. The highest prevalence can be seen in Southern most states including Louisiana, Mississippi, and Texas. AHA and ADA care guidelines provide strong evidence-based practice recommendations that could offer opportunities for timely clinical intervention to reduce or prevent limb loss. This study aimed to compare limb amputation rates among six southern states with high prevalence of diabetes using an existing data source. Study Design: Public use files from CMS were used to determine rates of lower extremity amputation among Medicare beneficiaries by year, from 2007 through 2018, for six Southern states (LA, AL, GA, MS, TX, FL) with high prevalence of diabetes. Informal and formal interviews with primary care practitioners and diabetes patients were conducted to assess perceptions of current levels of lower limb screening in general practice. Population Studied: Medicare Beneficiaries Principal Findings: Data visualizations created from the analysis of the CMS data demonstrated the increasing rates of amputations— from 1757 per 100,000 Medicare Beneficiaries in 2007 to 2660 per 100,000 in 2018, an increase of 51% based over the twelve-year period. Increasing rates were seen in all six states, but the highest rate of change was noted for Texas, with a 75% increase over the 12-year period. Qualitative findings suggest that screening and monitoring of lower limb circulation is only a secondary concern in managing diabetes. Conclusions: Changing the trajectory of the limb loss epidemic begins with increasing the awareness of health care professionals and offering opportunities for care practice changes.

Category: 2.0 - Behavioral and Social Determinants of Health - 2.04 - Social Determinants of Health - RESEARCH ABSTRACT

Grant Support: 3U54MD007595-14S3

COMMUNICATION NEEDS AMONG PUERTO RICAN CAREGIVERS AND PATIENTS COPING WITH CANCER.

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Abstract

Introduction: Patients and caregivers often struggle to adapt to a new cancer diagnosis leading to communication challenges. These communications challenges could affect the well-being of patients and caregivers coping with cancer and support the need for communication training interventions. However, the specific needs of Puerto Rican communications must be present and known. Purpose: The main goal of this presentation is to explore the communication needs of Puerto Rican patients and caregivers coping with cancer. The second goal is to identify barriers and facilitators in the cultural development of a communication intervention. Methods: A cross-sectional survey was conducted on Puerto Rican cancer patients and caregivers in the southern area of Puerto Rico. Participants selected communication skills, strategies, and essential topics they would like to discuss in a community-based intervention. Results: Ninety-two (n=92) Latinx cancer patients (n=52) and caregivers (n=40) completed the survey. The most-selected communication strategies included: “Have problem-solving skills” (Caregivers: 77.5%; Patients: 76.5%), demonstrating companionship throughout the cancer process (C:77.5%; P: 76.0%), “Plans for the future”(C:81.6%; P:72.0%), “Planning of treatments and goals” (C:77.5%; P: 73.1%,) and “Talk with children about cancer” (C:79.5%; P: 68.0%). End-of-life topics that were the most polarizing between patients and caregivers included discussing fears about death (C:66.7%; P: 48.0%) and creating a will (C: 61.5%; P:45.1%). Conclusions: Results indicate which topics and skills Latinx patients and caregivers would like to discuss in a communication training intervention. Patients and caregivers were interested in developing problem-solving skills and demonstrating mutual accompaniment in the cancer process. Results also revealed areas of possible discord within the dyad.

Category: 2.0 - Behavioral and Social Determinants of Health - 2.01 - Behavioral and Mental Health - RESEARCH ABSTRACT

Grant Support: U54MD007579

PREVALENCE OF COEXISTING CHRONIC HEALTH CONDITIONS AMONG HISPANIC/LATINX LIVING WITH MENTAL ILLNESS DIAGNOSIS.

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Abstract

People living with mental illness (MI) have higher morbidity and mortality due to preventable chronic diseases (cancer, heart disease, diabetes). A bidirectional relationship exists between chronic health conditions and psychological well-being. Hispanic/Latinx (H/L) have higher rates of diabetes, obesity, metabolic syndrome, and cardiovascular disease. However, studies lack appropriate representation of H/L when studying coexisting diseases and MI. These secondary analyses of the All of Us Research Database aimed to explore the relationship between coexisting chronic health conditions and a history of MI among H/L. Descriptive statistics and Logistics Regression Modelling (GLM) were used to examine the relationship between the prevalence of coexisting chronic health conditions and the history of a MI diagnosis among H/L. A 29% prevalence of H/L with a history of MI, 26% of H/L with coexisting chronic health conditions, 15% of H/L with a history of MI and coexisting chronic health conditions, and 10% of H/L without MI and chronic health conditions. Also, a higher prevalence of coexisting chronic health conditions among H/L with a history of a MI diagnosis than among H/L without a history of a MI diagnosis, OR = 1.48, 95% CI [1.37, 1.61], $p < .001$. Before this study, the prevalence of coexisting or comorbidity between mental and physical health conditions among H/L was unclear. Our results show a MI could predict a higher prevalence of coexisting chronic health conditions among H/L. Establishing a relationship between coexisting mental health conditions and MI among H/L can assist in addressing differences in the manifestation of chronic health within this subgroup. Moreover, it presents the need to develop interventions specifically targeting the H/L population with co-existing physical and mental health conditions.

Category: 2.0 - Behavioral and Social Determinants of Health - 2.01 - Behavioral and Mental Health - RESEARCH ABSTRACT

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STUDIES OF DRUG CRAVINGS DURING THE COVID-19 PANDEMIC

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Abstract

PURPOSE The outbreak of the novel SARS-COVID-19 coronavirus was a source of global stress and anxiety. Within a year of the pandemic, researchers reported significant discrimination increases and drug and alcohol use. It is unclear, however, if the level of COVID-19-specific anxiety, perceived stress, or discrimination were predictive of drug and alcohol cravings that might underlie the increased use. The pandemic, therefore, provided an opportunity to examine these real-world stressors as predictors of the desire for drugs and alcohol. We hypothesized that marijuana and alcohol cravings during the COVID-19 pandemic would significantly increase compared to pre-pracademic craving levels. We also expected that cravings would be predicted by COVID-19-specific anxiety and discrimination experiences. METHODS The Perceived Stress Scale and the COVID-19 Anxiety Scale were completed online by a community sample of participants (N=174). Another sample of 172 participants completed the Perceived Discrimination Scale in person. All participants completed a COVID-19 specific modification of the Marijuana Craving Questionnaire and the Desire for Alcohol Questionnaire. Mean scores per questionnaire were statistically analyzed via general linear modeling with demographic information as covariates and post-hoc analyses of interactions between factors to determine the significant predictors of drug and alcohol cravings. RESULTS Marijuana and alcohol cravings were positively correlated and different from pre-pandemic cravings. However, in partial support of the hypothesis, perceived stress and COVID-19 anxiety significantly predicted craving for marijuana but not alcohol. Perceived discrimination significantly predicted only alcohol cravings. DISCUSSION These findings suggest that the increased drug use during the COVID-19 pandemic might be related to increased COVID-specific anxiety and stress, but discrimination experiences might better explain the increased alcohol use.

Category: 2.0 - Behavioral and Social Determinants of Health - 2.01 - Behavioral and Mental Health - RESEARCH ABSTRACT

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FACTORS ASSOCIATED WITH FIREARM INJURIES IN THE UNITED STATES: AN EVALUATION OF THE NATIONWIDE EMERGENCY DEPARTMENT SAMPLE DATABASE

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Abstract

Introduction: Firearm injuries have become a pressing public health issue in the United States, emerging as a leading cause of death among young adults. Despite increased awareness of this public health issue, there is insufficient research on the factors contributing to firearm injury rates, especially at the national level. This study elucidates demographic and geographic characteristics associated with firearm injuries in the United States to help identify potential starting points for public health intervention. Methods: We performed a retrospective analysis of all Emergency Department (ED) visits for firearm injuries recorded in the Nationwide Emergency Department Sample (NEDS) database from January 2018 to December 2019. Using multivariable analysis, we identified predictors of firearm injuries. Our analysis encompassed several common risk factors for firearm injuries, including mental health conditions and social risk factors. Additionally, we included variables such as race/ethnicity, hospital type, sex, insurance status, household income, and regions of the country. Results: There were 41,440 ED visits because of firearm injuries in the study period. Most of these patients were Black (52.0%) and male (86.6%). The median age was 28 (IQR, 22-38) years. The most common etiologies were unintentional firearm injuries (55.0%), assault (36.4%), and self-inflicted injuries (5.3%). Factors that had the highest risk for firearm injuries include Blacks (OR=3.16, p<0.001), Uninsured (OR=5.08, p<0.001), and residents in the South region (OR=3.16, p<0.001). Lower rates were seen with females (OR=0.13, p<0.001) and highest income (OR=0.54, p<0.001). Conclusion: Black, uninsured, low-income, male patients who reside in the southern areas of the US are at the highest risk of firearm injuries in the United States. These findings can be used to inform public health interventions to help mitigate firearm injuries and fatalities in the US.

Category: 2.0 - Behavioral and Social Determinants of Health - 2.04 - Social Determinants of Health - RESEARCH ABSTRACT

STRUCTURAL RACISM AND HIV-ASSOCIATED COGNITIVE IMPAIRMENT

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Abstract

PURPOSE: Despite the use of antiretroviral therapy (ART), HIV-associated cognitive impairment (HIV-CI) prevails. A recent study revealed that Hispanics PWH (Puerto Rican and Mexican descent) have higher prevalence of HIV-CI compared to non-Hispanic white. Moreover, Hispanics of PR descent had higher rates when compared to Mexicans. Health literacy, access to health care, and language barrier contribute to these disparities. However, these factors may not justify the observed disparities among Hispanics. We hypothesize that structural racism and discrimination (SRD) contribute to these discrepancies. Our objective is to determine the biological, behavioral, and environmental factors within the cohorts of PWH in PR (PR-PR), Puerto Ricans in the US (PR-NYC), and Mexicans in San Diego (Mex-SD). Studying diverse Hispanic cohorts, we will have a unique opportunity to address these aims: 1. Determine the association between SRD, stigma, stress, and inflammation. 2. Determine the association between SRD and HIV-CI. 3. Test our hypothesis that PWH living in PR shows greater association between SRD and HIV-CI. The purpose of this study is to determine similarities and differences that could identify unique factors explaining these. Goal: by identifying these unique factors we could intervene to decrease HIV-CI. METHODS: Data and bode samples from PR-PR, Mex-SD, and PR-NYC cohorts will be analyzed for HIV-CI, mental health (MH), systemic inflammation, neurodegeneration markers, and zip codes (geocoding). Will determine the association between SRD and MH, SRD and HIV-CI, and comparison among Hispanic groups. EXPECTED RESULTS: We expect to observe an association between SRD and MH; and SRD, MH, inflammation, and HIV-CI. DISCUSSION: Our findings will increase our understanding about the relationship between SRD and HIV-CI in Hispanics PWH and identify modifiable factors. These are important steps in advancing towards health equity, improve HIV outcomes, and end the HIV epidemic.

Category: 2.0 - Behavioral and Social Determinants of Health - 2.04 - Social Determinants of Health - RESEARCH ABSTRACT

Grant Support: 2U54MD007600-36 project #8540, R01NS099036

3.0 - CAPACITY BUILDING

HISTOPATHOLOGY RESOURCE CORE- UNIVERSITY OF HAWAII

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Abstract

PURPOSE: The purpose of the University of Hawaii (UH) Histopathology Resource Core (http://histocore.jabsom.hawaii.edu/) is to provide education, training, service and access to equipment and consultation for histopathological techniques to users at UH and the broader research community within the State of Hawaii, as well as interested users from other institutions. METHODS: The Resource Core provides general histopathology services such as tissue processing, embedding (paraffin and frozen), H&E stain, special stains, immunohistochemistry, and in situ hybridization etc. Equipment includes: automated tissue processors, cryostats, microtomes (sliding and rotary), and vibratome. Equipment is maintained, serviced regularly, and available for individual or full service. The core provides training in all histological techniques and equipment. Experimental design assistance is available. RESULTS / EXPECTED RESILTS: The facility has 60 cumulative unique users and 41 unique principal investigators from the year 2022 and 2023. There were 52 requests from 31 users and 23 principal investigators during the period of 9/20/22 to 2/28/23. The facility was cited in 3 peer-reviewed publications and 8 meeting presentations (1 oral presentation and 7 posters) at scientific meetings. DISCUSSION / CONCLUSION: The Histopathology Resource Core is a valuable resource for the biomedical health disparity research community at the University of Hawaii at Manoa and Hilo. The core has expanded services to National Oceanic and Atmospheric Administration, Department of Land and Natural Resources, Division of Fish and Wildlife, Saipan, Poseidon Fisheries Research, University of Guam, Virginia Institute of Marine Science.

Category: 3.0 - Capacity Building - 3.01 - Education and Training - RESEARCH ABSTRACT

Grant Support: NIH/DHHS grant # U54MD007601

INNOVATIVE RESEARCH STUDIO PROGRAM FOR HEALTH DISPARITIES RESEARCH

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Abstract

Purpose: The Research Capacity Core (RCC) of the University of Hawaii Ola HAWAII RCMI program has designed and implemented a modified Research Studio Program (RSP), modeled after those successfully used by Clinical and Translational Research centers, to enhance the research productivity of investigators with an emphasis on improving minority health and addressing health disparities. Methods: Applications for the RSP are prioritized based on new investigator status and the alignment of the research with Ola HAWAII’s overall mission. Investigators can request a studio in ten possible topic areas: identification of mentors or collaborators, research resources, hypothesis generation, specific aims development, study design, project implementation, project monitoring, data analysis and interpretation, feedback on manuscripts, and review of grant proposals. Background materials are provided by the investigator prior to the studio session. Each session is an RCC-moderated 1-hour round-table discussion between the investigator and assembled panel of senior investigators and subject-matter experts, with inclusion of health disparities expertise and community participation. Post-studio surveys evaluate participant satisfaction, RSP effectiveness, and suggested areas for improvement. Results: Thus far, we have held three research studio sessions, with two others scheduled soon. We are limiting applications in this first year to gauge RCC capacity for the RSP, but we anticipate high demand from Hawaii researchers. Inclusion of Ola HAWAII Community Engagement Core (CEC) members on all panels ensures community and

minority health viewpoints. Preliminary RCC meetings with requesting investigators were found to advance the investigator's needs and goals during the RSP sessions. Conclusions: A personalized RSP with CEC participation has great potential to improve the research quality and productivity of new investigators focused on minority health and health disparity research.

Category: 3.0 - Capacity Building - 3.04 - Mentoring and Professional Development - RESEARCH ABSTRACT

Grant Support: U54MD007601

COMMUNITY ENGAGEMENT TO PROMOTE RACISM AND COLORISM AWARENESS IN HEALTH DISPARITIES RESEARCH

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Abstract

PURPOSE: The Community Engagement Core (CEC) coordinated this work group in response to one of the researchers and one of the members of our Community Coalition Team interest in collaborating. The aims of this initiative are to 1) Discuss the intersection of racism, colorism and social determinants of health in Puerto Rico and 2) Promote awareness regarding this topic in health disparities research. METHODS: The group consists of 8 participants from social sciences (psychology, social work, anthropology) and natural sciences (pharmacogenomics, pharmacology, medicine). We have monthly meetings to promote discussion regarding relevant literature and to coordinate educational and dissemination initiatives including creating a guide to implementing a colorism scale, and organizing a symposium for research and community on anti-racism research awareness. RESULTS: The symposium focused on anti-racism research awareness. Evaluation showed that in the pre-test survey (n=33) participants indicated their main reason to attend this activity were to gain knowledge about the topic (n=17), deepen knowledge about the topic (n=14), develop research initiatives (n=5) and develop community services. (n=6). In the post test survey (n=28) participants strongly agreed or agreed that: the coordination for this activity was efficient and organized, and it was worth investing their time in this activity. (n=28). Finally, the researchers in this work group are incorporating the colorism scale in health disparities research projects. DISCUSSION: This initiative is relevant because it promotes an awareness of racism and colorism and their impact in overall health. We seek to promote the incorporation of racism and colorism in research projects. Also, we believe it is important to integrate a social sciences perspective in basic and clinical research. Particularly the concept of social determinants of health and its relationship to health disparities among individuals and communities.

Category: 3.0 - Capacity Building - 3.01 - Education and Training - RESEARCH ABSTRACT

Grant Support: This project is supported by the Center for Collaborative Research in Health Disparities (CCRHD), which is funded by an RCMI-Grant from the National Institute on Minority Health and Health Disparities (U54 MD007600) at the University of Puerto Rico, Medical Sciences Campus.

EVALUATION OF AIML + HDR: A COURSE TO ENHANCE DATA SCIENCE WORKFORCE CAPACITY FOR HISPANIC BIOMEDICAL RESEARCHERS

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Abstract

Artificial intelligence (AI) and machine learning (ML) facilitate the creation of revolutionary medical techniques. Unfortunately, biases in current AI and ML approaches are perpetuating minority health inequity. One of the strategies to solve this problem is training a diverse workforce. For this reason, we created the course "Artificial Intelligence and Machine Learning applied to Health Disparities Research (AIML + HDR)" which applied general Data Science (DS) approaches to health disparities research with an emphasis on Hispanic populations. Some technical topics covered included the Jupyter Notebook Framework, coding with R and Python to manipulate data, and ML libraries to create

predictive models. Some health disparities topics covered included Electronic Health Records, Social Determinants of Health, and Bias in Data. As a result, the course was taught to 34 selected Hispanic participants and evaluated by a survey on a Likert scale (0–4). The surveys showed high satisfaction (more than 80% of participants agreed) regarding the course organization, activities, and covered topics. The students strongly agreed that the activities were relevant to the course and promoted their learning (3.71 ± 0.21). The students strongly agreed that the course was helpful for their professional development (3.76 ± 0.18). The open question was quantitatively analyzed and showed that seventy-five percent of the comments received from the participants confirmed their great satisfaction.

Category: 3.0 - Capacity Building - 3.01 - Education and Training - RESEARCH ABSTRACT

Grant Support: RCMI grant U54 MD007600 (National Institute on Minority Health and Health Disparities) from the National Institutes of Health (Supplement 3U54MD007600-35S2)

EVALUATION OF THE 2022 OLA HAWAII MENTORING BOOTCAMP

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Abstract

PURPOSE: New investigators need training in NIH grantsmanship. Our purpose is to describe the content and evaluation findings of 2022 Mentoring Bootcamp, a multi-week training series for post-doctoral fellows and early-stage investigators on grant acquisition. Mentoring Bootcamp has been offered annually by the Ola HAWAII, the RCMI at the University of Hawai‘i (UH) since 2017. The 2022 Mentoring Bootcamp consisted of two one-hour, skills-building sessions held three days a week over four weeks (24 hours total). METHODS: Evaluations were collected via Qualtrics and analyzed using R version 4.2.1. Each evaluation included seven questions per session that asked about usefulness and applicability of the topic, the length of the session, and four Likert-Scale questions on speaker quality. Finally, two open ended questions inquired on feedback on topics and potential improvements. Attendees were sent the evaluation for the sessions they attended via Qualtrics at the end of each week. RESULTS: In 2022, 112 of 198 (75%) registrants attended. Initially, each session had approximately 60 attendees, but the attendance rate steadily declined by 10 participants per week, with attendance in the 20s by week four. The mean usefulness score for sessions was 1.23 out of 3, with 1-useful and 3-not useful. General research sessions were rated the most useful, while sessions that focused on areas outside participants' interests, such as community-based research for basic scientists and vice versa, were found to be less useful. Findings were used to improve the program for the 2023 offering, which has been shorten to two weeks. The first week covers general information, while the second week includes tracks tailored to the needs of basic, clinical, and social/community researchers. CONCLUSION: The evaluation data suggest that Mentoring Bootcamp was well-received by attendees and also demonstrate the usefulness of evaluation data in improving training programs.

Category: 3.0 - Capacity Building - 3.03 - Investigator Development - RESEARCH ABSTRACT

Grant Support: The University of Hawai‘i RCMI Program is supported by U54MD007601 from the National Institute on Minority Health and Health Disparities.

COMMUNITY TRAINING INSTITUTE FOR HEALTH DISPARITIES: PROMOTING HEALTH DISPARITIES RESEARCH BY DEVELOPING A COMMUNITY RESEARCH CAPACITATION PROGRAM

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Abstract

Community-Engaged Research has proven to be an essential strategy for reducing health inequities. Correspondingly, Community-Based Participatory Research evidence has been reported to bring ample benefits in attending to community health concerns, active integration of community in health research, and reducing inequities associated with health, among others. To better support this integration, a Community

Training Institute for Health Disparities (CTIHD) was created to capacitate community members in health disparities research to aid the formation of equitable community-academic partnerships, approved by our community partners. A mixed methodology was utilized to evaluate the research component of the CTIHD, including course satisfaction, knowledge change, cognitive debriefing, retention rate, completion rate, and research proposal development. The retention and completion rates were 91% and 83%, respectively. Two out of six courses (overall satisfaction rate: 100%) demonstrated a significant change in knowledge (paired t-test: $p<0.05$). Cognitive debriefing results indicate that changes are recommended in program structure, practical activities, technical language, and time of courses. Outcomes of the CTIHD include forming four community-academic partnerships and submitting three proposals for funding opportunities. Currently, research proposals are in different phases of research, and topics include cancer and patient communication, obesity, and mental health (anxiety and depression). Findings from this study suggest that the CTIHD could be a valuable strategy to provide research capacitation to community members, facilitate the formation Community-Academic Partnerships, increase the development of research proposals centered on community health needs, and aid in the integration of community members in research activities. Future direction for the program includes evaluating the medium- and long-term impact and supporting the research projects and partnerships

Category: 3.0 - Capacity Building - 3.01 - Education and Training5.01 Community-Based Participatory Research Addressing Minority Health and Health Disparities - RESEARCH ABSTRACT

Grant Support: PSHU-RCMI Program 5U54MD007579-38

CREATING AND IMPLEMENTING A FORMAL TRAINING PROGRAM IN COMMUNITY HEALTH PROMOTION FOR UNDERSERVED POPULATIONS IN SOUTHERN PUERTO RICO.

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Ponce Research Institute, Ponce Health Sciences University; Public Health Program, Ponce Health Sciences University;

Abstract

Introduction: The Community Training Institute for Health Disparities (CTIHD) designed and implemented a curriculum for a community health promotion program to provide training and enable community members to facilitate community action by empowering individuals in six competencies that were identified and reviewed by community partners. These competencies are: Knowledge-based health topics, capacity building skills, organization skills, teaching skills, interpersonal skills, and communication skills. Which provide community leaders with knowledge and skills to respond to community health needs, specifically the prevention of chronic medical conditions. Methods: A problem-based curriculum design that integrates a competency-based learning model, which included the creation and development of two courses: Introduction to Community Health Promotion and Community Wellness & Health Promotion. Each course consisted of 10 sessions with a duration of three hours per session. The assessment per sessions included a pre/post test and overall evaluation of the session, and a discussion or practice exercise at the end of the session. Wilcoxon rank test was used to evaluate the change in knowledge using the pre/post test scores. Results: For this first cohort a total of 12 community leaders from different southern municipalities of Puerto Rico were recruited for the 2020-2021 academic year. From these, 9 completed the first course and 8 completed the second (75% retention rate for Course 1 and 67% retention rate for Course 2). Statistical significance was identified for knowledge where we found a 18% of increase for Course 1 (Difference 1.2, $p<0.001$) and 16% increase for Course 2 (Difference 0.85, $p<0.001$). Conclusion: This curriculum enhances communities' resources, providing their leaders with the necessary competencies to impact health behavior, promote prevention, and become a health promotor within their communities.

Category: 3.0 - Capacity Building - 3.01 - Education and Training - RESEARCH ABSTRACT

Grant Support: PSHU-RCMI Program 5U54MD007579-38

UNIV OF HAWAII-MHRT INFECTIOUS DISEASES GLOBAL HEALTH PROGRAM

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Abstract

PURPOSE: The University of Hawai`i (UH), NIH supported Minority Health Research Training (MHRT) program, offers short-term global health research training for underrepresented undergraduate and graduate students. MHRT encourages students to pursue infectious diseases, public health, biomedical and clinical research careers using cultural competence and global health issues as vehicles. METHODS: UH partnered with leading international scientists who served as mentors. The curriculum is 8-months: 1-semester global health and 8 Steps of Research course, 2-weeks pre-training to prepare students for research abroad, mentored international summer research experience, and 8-day post-travel workshop upon returning. Students "graduate" by presenting at the UH research symposium and are encouraged to publish and present their results at conferences. RESULTS: Since 2014, MHRT has trained ten cohorts,100 students. Non-Hawaii trainees included students from RCMI institutions; Howard Univ, Univ of Delaware, and Univ of Puerto Rico. 94 students were underrepresented minorities, four were low socio-economic and two were from rural areas. Among MHRT graduates (n=95), 55% are enrolled in graduate studies and professional degrees; 13% are in post baccalaureate programs; 5% are finishing undergraduate degrees; 16% are in gap year; and 11% are in STEM employment. Half of the students presented at scientific conferences and 11 co-authored peer-reviewed publications. Student surveys indicated significant improvements on students' perception of their research identity (p=0.002), professional skills (p=0.034), and experience in research (p=0.023). CONCLUSIONS: UH-MHRT provides comprehensive health disparities research training by providing a rigorous, spring and summer classroom and experiential approaches in global health, infectious diseases and international research mentoring. Students' academic, professional, and personal benefits, and their research efforts and interests are fostered.

Category: 3.0 - Capacity Building - 3.01 - Education and Training - RESEARCH ABSTRACT

Grant Support: This research was supported by NIH grants MHRT (T37MD008636), COBRE (P30GM114737), and OLA Hawaii (U54MD007601).

USING NETWORK ANALYSIS TO UNDERSTAND COLLABORATIONS PATTERNS

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Abstract

PURPOSE: The objective of this evaluation was to understand the scientific collaboration patterns of the PHSU RCMI Pilot Project Calls using Social Network Analysis (SNA). SNA is a useful tool that can be used to map relationships and interactions of scientific collaborations. It can identify central actors, evaluate critical data about program interactions, and provides the opportunity to develop targeted interventions that could improve program outcomes. METHODS: We conducted a systematic document review of the two Pilot Project Calls (2020-2021 and 2022-2023) including key attributes of the investigators and collaborators such as academic institution, highest degree, and collaborator type. RStudio was used to analyze and map the networks resulting from collaborative interactions. RESULTS: The results shows that diversity of disciplines and affiliations in collaborative relationships increased from 2020-2021 to 2022-2023 including clinicians, basic and behavioral researchers collaborating. In 2020-2021, eight smaller research groups collaborated, compared to five groups in 2022-2023. However, the researchers were more connected in the 2022-2023 network, resulting in a more extensive collaborative research cluster with 15 researchers. Moreover, the network visually identified a mentor as a key player who connected two research clusters. DISCUSSION: Findings demonstrated that the diversity of disciplines and affiliations in the collaborative relationships increased over time, which support the mission of the program. The decrease in the number of smaller research groups in 2022-2023 indicates that researchers were more connected, resulting in a positive transformation of the network. These findings suggest that the program was successful in promoting scientific collaboration. SNA can serve as a valuable tool for evaluating and develop data driven decision to improving research collaborations and program outcomes.

Category: 3.0 - Capacity Building - 3.03 - Investigator Development - RESEARCH ABSTRACT

Grant Support: The PHSU Specialized Center in Health Disparities is Supported by the National Institute on Minority Health and Health Disparities (NIMHD) under the Award Number U54MD007579.

STRATEGIC ACADEMIC RESEARCH TRAINING EVOLVES FROM A PILOT PROJECT PROGRAM TO IMPROVE SUCCESSFUL OUTCOMES

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Abstract

The RCMI Program at Ponce Health Sciences University (PHSU) investigator development core (IDC) is critical support for research career development of ESIs at PHSU. The current IDC was designed to test the hypothesis that incorporation of a Strategic Academic Research Training program (START) that focused on professional development workshops, team mentoring, and project support for an ESI will result in greater success in acquisition of independent extramural funding and more rapid career advancement. Methods: We collected data from two 5-year cycles of ESI research support of the PHSU RCMI program: a pilot project program period starting in 2014 and a second period marked by the founding of START in 2019. Data in areas of publications, funding, mentoring interactions, academic promotion and ESI satisfaction were collected in aggregate from each period and compared. Results: The 2014-19 period funded 1-year-long pilot projects without additional training or mentoring. None of the PIs were able to publish their findings nor develop additional extramural research funds within the timeframe of the pilot project. The START program funded 2-year-long pilot projects and added required professional development and mentoring. This START phase showed improved publications, generation of extramural funds for 2/3 of the ESIs funded by RCMI, and the career advancement (academic promotion) of 1/3 of participants. Conclusions: Lessons learned in the 2014 period RCMI IDC led to the development of a new, hypothesis-driven IDC at PHSU called START. The specific incorporation of key training in professional development areas that are not traditionally provided in the advanced degree programs or post-docs and a more structured approach to mentoring provided a strong base for ESI career advancement. The increase in pilot project funding to two years lead to substantial improvement in the successful outcome and return on investment.

Category: 3.0 - Capacity Building - 3.03 - Investigator Development - RESEARCH ABSTRACT

Grant Support: U54-MD007579-38

COMMUNITY-CENTERED RESEARCH: CREATING CHANGE THROUGH COLLABORATION

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Abstract

PURPOSE: To foster collaborations that promote community engagement in the design, dissemination and implementation of health disparities research through capacity building. METHODS: Collaborating with a local community organization, “Reach Out (RO),” we utilized dissemination efforts to build and strengthen a shared community focus on equity and knowledge production in partnership with Community Health Workers (CHWs). We implemented a co-learning activity that allowed RO’s first monolingual Spanish-speaking CHW cohort to complete their field practicum and created an opportunity to improve the publication of a series of community forums focused on air quality and its impacts on health of the communities surrounding the Salton Sea. RESULTS/EXPECTED RESULTS: Significant findings included learning that creating collaborative spaces strengthens the relationship between the academic institution and the community partner and provides the opportunity to identify facilitators and barriers to sharing existing knowledge to increase accessibility and awareness, leading to a higher impact on health outcomes. DISCUSSION/CONCLUSION: Creating co-learning opportunities that engage and educate community members and academics is critical to improving the quality and infrastructure of health disparities research. Evaluating these efforts is necessary to reproduce and expand community-engaged research further.

Category: 3.0 - Capacity Building - 3.01 - Education and Training - RESEARCH ABSTRACT

Grant Support: Research reported in this presentation was supported by the National Institute On Minority Health And Health Disparities of the National Institutes of Health under Award Number U54MD013368. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health

MAPPING THE OPAL SCORE FOR CLINICAL TRIALS TO COORDINATOR HOURS: A SINGLE SITE STUDY

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Abstract

Workload assessments help provide validation to increase staff, evaluate and ensure equal distribution of work, and assist with budget justifications. The Ontario Protocol Assessment Level (OPAL) is one of the most widely used protocol assessment tools. This study mapped an adapted OPAL score for clinical trials to actual coordinator hours from a single site to determine if the adapted OPAL score could predict coordinator hours. The purpose was to project a more accurate capacity estimate when considering new studies. The Morehouse School of Medicine (MSM) clinical trials management system was queried for actively enrolling interventional studies with corresponding coordinator effort tracking from June 1, 2022, to December 1, 2022. Protocols were graded using an adapted OPAL tool. Linear regression analysis was performed to determine whether a linear association exists between the adapted OPAL score and coordinator effort. Seven studies were included in the analysis. The overall regression was statistically significant ($R2 = 0.78$, $p = 0.008$), and the adapted OPAL score significantly predicted tracked coordinator hours ($\beta = 77.22$, $p = 0.008$).

Category: 3.0 - Capacity Building - 3.02 - Institutional Readiness - CLINICAL PRACTICE ABSTRACT

Grant Support: UL1TR002378 and U54MD007602

RESEARCH INFRASTRUCTURE CORE AT XAVIER UNIVERSITY OF LOUISIANA

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Xavier University of Louisiana

Abstract

Xavier University's RCMI Cancer Research Center aims to enhance the quality and productivity of research in cancer and cancer-related health disparities by establishing a Research Infrastructure Core (RIC) with shared instrumentation, drug discovery and delivery programs, cell and molecular biology facilities, and bioinformatics and biostatistics services. Based on the current portfolio of Xavier investigators, the RIC implements new rules of prioritization, improved standard operation procedures, and management of core facilities. The RIC benefits Xavier investigators across all health-related research areas by achieving three specific aims: Aim 1. Acquire, maintain, and operate shared analytical and bioanalytical instrumentation that will be utilized by not only the basic biomedical research projects and pilot projects to be funded by the current RCMI application, but also all Xavier investigators across a broad range of health-related research areas. The RIC will provide essential instruments and technical support for Xavier's biomedical research projects. Aim 2. Form a faculty expertise group (FEG) to provide faculty-level expertise in research methodology, specialized laboratory techniques, statistics, bioinformatics and health informatics. The FEG will consist of senior faculty members with expertise in experimental designs using cell and molecular, mechanistic, drug discovery and formulation methods as well as data processing using bioinformatics and biostatistics tools. Aim 3. Implement an effective cost recovery program for the Research Infrastructure Core. The RIC will continue to use a fee charging system started in 2012. The FEG will oversee the charge back process so that fees collected will continue to be used to defray the cost of consumables and repair costs needed for the core facilities. Measures will be implemented to increase cost recovery of core facilities by underwriting services in external grant applications by Xavier investigators.

Category: 3.0 - Capacity Building - 3.01 - Education and Training - RESEARCH ABSTRACT

Grant Support: NIH RCMI program at Xavier University of Louisiana through Grant 5U54MD007595 (G. Wang)

EVALUATING STUDENT PHARMACISTS' PERCEPTIONS ON VACCINE COMMUNICATION: FINDINGS FROM THE LAHEALTHCOM COMMUNICATION TRAINING PROGRAM

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Abstract

Introduction: Pharmacists commonly review patient clinical profiles and have the direct opportunity to communicate with patients about vaccines and medication knowledge, which enforces the need for student pharmacists to develop their communication skills regarding vaccines in preparation for post-graduate practice. Previous studies on student pharmacists' vaccination knowledge and comfort with administration are reported; however, there is limited data evaluating students' overall self-reported comfort level in communicating with patients about vaccines. This project aims to evaluate student perceptions in communicating with patients about commonly administered vaccines. Methods: Students in a doctorate degree-seeking program were invited to participate in a vaccine hesitancy and communication training for healthcare professionals. Approval from the Institutional Review Board was obtained prior to data collection, and all participants provided informed consent prior to participation. Participants completed self-study modules and a pre-assessment questionnaire prior to participating in the training. Demographic data, knowledge, and perception about vaccines were assessed. Survey data were summarized using descriptive statistics; responses were recorded in percentages. Results: The sample included participants (n=284) that were majority female, black, between the ages of 17-24, and employed in a retail/independent pharmacy setting. In general, 62% (175) of participants reported being comfortable or very comfortable in communicating with patients, while only 42% (118) of participants reported being comfortable or very comfortable in communicating with patients about vaccines in general, respectively. Participants reported being comfortable or very comfortable communicating about the influenza (45%), COVID-19 (44%), and pneumococcal vaccines (32%), respectively. Conclusion: Participants' comfort levels in communicating with patients about vaccines varied. Student pharmacist

Category: 3.0 - Capacity Building - 3.01 - Education and Training - CLINICAL PRACTICE ABSTRACT

Grant Support: Funded by the Xavier University Research Centers in Minority Institutions: 3U54MD007595-12S5 (PI - Wang, D'Amour; Supplement PI - Williams)

RESEARCH INFRASTRUCTURE CORE AT CLARK ATLANTA UNIVERSITY

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Abstract

The objective of the Research Infrastructure Core (RIC) within the Center for Cancer Research and Therapeutic Development (CCRTD) at Clark Atlanta University (CAU) is to provide state-of-the-art research support, including instruments, technology, education, and training for all investigators and research staff engaged in health-related and biomedical research. Five functional core laboratories, as funded by NIH/NIMHD/RCMI U54 Grant 2U54MD007590, were consolidated from 8 core facilities to streamline support of research projects, pilot projects, training and education, and all CCRTD researchers; the cores include Cell and Molecular Biology Core Laboratories (CMBCL), Histology and Imaging Core Laboratories (HICL), Cancer Biostatistics and Bioinformatics Core Laboratories (CBBCL), Drug Discovery Core Laboratory (DDCL), and Animal Core Laboratories (ACL). Since the 2019 RCMI program renewal, the RIC acquired several cutting-edge instruments with collaborative support from RCMI, CAU Title III, and Georgia Research Alliance to maintain and advance research progress, including IVIS Spectrum In Vivo Imaging System (LI-COR Biosciences), IncuCyte S3 Live-Cell Analysis System (Sartorius Corp), and LTQ XL Linear Ion Trap Mass Spectrometer (Thermo Fisher Scientific). Moreover, we've updated our web-based core facility management system, iLab Solutions, for both users to reserve equipment, and for the RIC staff to efficiently and remotely manage instrument use via a kiosk interface such as turning instrument channels on or off, checking the status of a particular channel and other services across multiple labs. In summary, the RIC provides the major instrumentation and training infrastructure to successfully support health-related and biomedical research at CAU.

Category: 3.0 - Capacity Building - 3.01 - Education and Training - RESEARCH ABSTRACT

Grant Support: Acknowledgment: The study was supported by the NIH/NIMHD/RCMI U54 Grant 2U54MD007590.

4.0 - CLINICAL AND TRANSLATIONAL MINORITY HEALTH AND HEALTH DISPARITIES RESEARCH

THE ASSOCIATION BETWEEN COMMUNITY-LEVEL ECONOMIC DEPRIVATION AND INCIDENCES OF EMERGENCY DEPARTMENT VISITS ON ACCOUNT OF ATTEMPTED SUICIDES IN MARYLAND.

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Abstract

Background: Suicide is a major cause of mortality in the United States, accounting for 14.5 deaths per 100,000 population. Many emergency department (ED) visits in the United States are due to attempted suicides/self-inflicted injuries. Suicide attempts/self-inflicted injuries predict subsequent completed suicides. Socioeconomic factors, such as community-level socioeconomic deprivation, significantly affect many traditional risk factors for attempted suicides and suicides. Aim: To determine the association between community-level socioeconomic deprivation and ED visits for attempted suicide in Maryland. Methods: A retrospective analysis of attempted suicides in the Maryland State Emergency Department Database from January 2019 to December 2020. Community-level socioeconomic deprivation was measured using the Distress Community Index (DCI). Multivariate regression analyses were conducted to identify the association between DCI and attempted suicides/self-harm. Results: There were 3,564,987 ED visits reported in the study period, with DCI data available for 3,236,568 ED visits; 86.8% were younger than 45 years, 64.8% were females, and 54.6% non-Hispanic Whites. The incidence of attempted suicides increased with income (11.3% vs. 12.8% vs. 27.3% vs. 48.5% in Quartiles I, II, III, and IV). In the multivariate logistic regression, compared to prosperous zones, those in comfortable (OR=0.80,95% CI: 0.73-0.88, p<0.01), Mid-Tier (OR=0.76, 95%CI:0.67-0.86, p<0.01), At-Risk (OR=0.77; 95%CI: 0.65-0.92, p<0.01) and Distressed zones (OR=0.53; 95%CI:0.42-0.66, p<0.01) were less likely to visit the ED for attempted suicide. Conclusion: Prosperous communities had the highest incidence of attempted suicides, with the risk of attempted suicide increasing as individuals move from the least prosperous to more prosperous areas.

Category: 4.0 - Clinical and Translational Minority Health and Health Disparities Research - 4.01 - Clinical and Translational Science Research - RESEARCH ABSTRACT

THE DISTRESS COMMUNITY INDEX: A MEASURE OF COMMUNITY-LEVEL ECONOMIC DEPRIVATION AND FIREARM INJURIES RATES IN MARYLAND

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Howard University College of Medicine

Abstract

Background: This study aimed to investigate the relationship between community-level economic deprivation, as measured by the Distress Community Index (DCI) and ED visits on account of firearm injuries (Assaults and Unintentional). Methods: A retrospective analysis was conducted using the Maryland State Emergency Department Databases (SEDD) from January 2019 to December 2020 to explore the association between the DCI and ED visists because of firearm injuries (Assaults and Unintentional). The DCI utilizes seven variables, based on zip codes, generating five levels of socioeconomic distress (prosperous, comfortable, mid-tier, at-risk, and distressed). In a multivariate analysis, we adjusted for age, sex, mental conditions, alcohol addiction, substance abuse, smoking, race/ethnicity, insurance type, and median income. Results: Of the 2767 ED visits for firearm injuries, 84.5% were Black and 88.5% male. The median age was 27 (21-35) years, and the mortality rate was 17.7%. A statistically significant association was found between economic deprivation and ED visits for firearm injuries. Compared to prosperous communities, the odds ratios (OR) were comfortable (OR=1.23, 95% CI 1.01-1.49, p=0.04), mid-tier (OR=1.56, 95% CI 1.25-1.93, p<0.001), at-risk (OR=1.32, 95% CI 1.02-1.72, p=0.04), and distressed (OR=2.05, 95% CI 1.51-2.77, p<0.001). Conclusion:

The study highlights the significant association between community-level economic deprivation, as measured by the Distress Community Index, and the incidence of firearm injuries in Maryland. The findings underscore the importance of addressing socioeconomic disparities and implementing targeted interventions to reduce firearm-related injuries in economically distressed communities.

Category: 4.0 - Clinical and Translational Minority Health and Health Disparities Research - 4.01 - Clinical and Translational Science Research - RESEARCH ABSTRACT

A DESCRIPTION OF ANTIPSYCHOTIC PRESCRIBING PATTERNS BASED ON RACE ON THE INPATIENT BEHAVIORAL HEALTH SETTING OF A PRIVATE ACADEMIC HEALTH CENTER

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Abstract

Background: There is previous evidence documented in the literature regarding racial disparities in the clinical diagnosis and provision of services in mental health conditions. Previous reports have shown African Americans more commonly receive first generation antipsychotics, higher antipsychotic doses, and long-acting injectable formulations. Consequently, this study aims to describe the prescribing patterns of antipsychotic medications in the inpatient setting based on patients' race, and to explore appropriateness of therapy based on Food and Drug Administration labeling and avoidance of inappropriate polypharmacy. Methods: Retrospective chart review of 387 psychiatric patients attending the inpatient behavioral unit at Ochsner Health, and who received a prescription for an antipsychotic medication at the time of discharge. Frequencies and percentage distributions were computed by demographic variables, medical conditions, and screening tests. Logistic regression, analysis of variance, the Bonferroni procedure, and the Holm method were used to examine significant differences among groups. Results: Differences were found by race in terms of dosing, as well as in men, patients with longer lengths of stay, and schizophrenia and bipolar mania diagnoses, compared to MDD. Housing and voluntary admission had positive role in prescribing patterns following FDA recommendations and current guidelines, though patients with DMII, female patients, heavier patients, and those with more antipsychotics at discharge were less likely to have appropriate therapy. Conclusion: This descriptive study offers insight into patient characteristics that are associated with increased or possibly unnecessary exposure to antipsychotic therapy. Future studies in expanded populations are recommended to fully elucidate the role of race on antipsychotic prescribing on the inpatient setting of behavioral health facilities.

Category: 4.0 - Clinical and Translational Minority Health and Health Disparities Research - 4.01 - Clinical and Translational Science Research - RESEARCH ABSTRACT

Grant Support: We are grateful for funding from the NIH RCMI program at Xavier University of Louisiana through Grant 5U54MD007595 (G. Wang)

CTSA FUNDING INITIATIVE FOR HEALTH DISPARITIES RESEARCH

Dr. Matthew Arnegard
NIH
ME ARNEGARD; ML Carter-Donerson; HL Baker; A Vaught; JM Doyle; JD Nagel; R Gopal-Srivastava; EK Rosemond; S Chang; Initiatives & Consortium-Wide Activities Section Members
Clinical and Translational Science Awards Program Branch, Division of Clinical Innovation, National Center for Advancing Translational Sciences (all authors)

Abstract

PURPOSE The persistence of health disparities underscores the importance of translating science innovations into practice to improve the health outcomes of underserved populations. Through the Clinical and Translational and Science Awards (CTSA) Program Collaborative and Innovative Acceleration Award (CCIA) initiative, the National Center for Advancing Translational Sciences (NCATS) supports innovative research and partnerships to address health disparities. METHODS All awarded CCIA projects were reviewed and analyzed by activity code, research area, and stage of the translational science spectrum. Subject matter experts identified awards that were relevant to health disparities research and categorized them in terms of study populations, health disparities, and translational research topics. RESULTS NCATS funded 37 U01 and 18 R21 CCIA awards from 2016 to present. Ten (18%) of the 55 awards included goals relevant to translational science outcomes

for populations that are underrepresented and/or experience health disparities. Of these ten projects, 90% had a strong community engagement component. Six projects focused on racial/ethnic minorities, whereas four focused on rural or other hard to reach populations. Four projects had strong technological innovation or data science components, and three projects addressed disparities in the context of public health emergencies (opioid use disorder or maternal mortality). The 10 projects identified span the following stages of the translational science spectrum: clinical research (6); clinical implementation (3); and public health (1). DISCUSSION Some CCIA awards have addressed health disparities. NCATS encourages additional applications in this area. The CCIA initiative provides an ideal opportunity for the CTSA Program and Research Centers in Minority Institutions Program to collaborate on the goal of reducing health disparities, which is shared by NCATS and the National Institute on Minority Health and Health Disparities.

Category: 4.0 - Clinical and Translational Minority Health and Health Disparities Research - 4.01 - Clinical and Translational Science Research - POLICY ABSTRACT

Grant Support: Not applicable

ROLE OF DISTRESS IN CANCER SURVIVORS' PERIODONTAL HEALTH

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Abstract

PURPOSE This study highlights the potential for addressing psychological distress as a driver of racial/ethnic disparities in breast cancer (BC) and periodontal health. This study aims to identify an association between psychological distress and periodontal disease in Hispanic/Latinos (H/L) BC survivors. METHODS Sociodemographic, lifestyle, general health, and oral health questionnaires were administrated. Participants provided a saliva sample before their oral examination. Clinical parameters of periodontitis included probing pocket depth (PD), gingival recession (GR), and bleeding on probing (BP). Self-reported questionnaires for assessing mental health (PHQ-8, GAD7, and PSS) were administered. RESULTS Preliminary descriptive analyses were conducted on an ongoing investigation of H/L BC survivors (N=24). The mean participant's age was 62.8. Participants exhibited symptoms of depression (33%), anxiety (29%), and perceived stress (58%). Regarding periodontal health, the teeth missing average was 5.63; 91.7% had PD ≥ 4 mm, and 50% had periodontitis. Of those participants with periodontitis, 25% exhibited moderate to severe depressive symptoms and 33.3% stress symptomatology. Within the last 12 months, participants indicated experiencing pain in their teeth (66.7%) and mouth (54.4 %). Moreover, 48% described the state of teeth and gum health as regular. Participants (33.3%) also reported disruption in their sleeping patterns due to teeth/mouth problems. Currently, we are evaluating the effect of psychological distress on salivary cortisol and inflammatory cytokine networks among participants. CONCLUSION Preliminary results shed an overview of dental health among H/L BC survivors. As the sample size increases, the study team will continue assessing the impact of biobehavioral factors on periodontal health.

Category: 4.0 - Clinical and Translational Minority Health and Health Disparities Research - 4.01 - Clinical and Translational Science Research - RESEARCH ABSTRACT

Grant Support: U54MD007579 R25MD007607

EPIDEMIOLOGICAL INVESTIGATION AND TRANSCRIPTIONAL GENE EXPRESSION ON THE PATHOPHYSIOLOGY OF TYPE-2 DIABETES OF AFRICAN AMERICANS IN WASHINGTON DC

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Abstract

The burden of Type 2 Diabetes Mellitus (T2DM) impacted over 37 million individuals in the US, of which 12.1% of African Americans (AA) with higher mortality and comorbidities compared to other Americans. The current research focuses on investigating the differential gene expression of T2DM in AA around Washington, DC area to determining the possible socioeconomic factors and other health conditions, influencing disease risks and severity in this population. Blood samples from a previously established cohort (n=377, ages 45 - 65 years, both males and females) were used with T2DM (n=77) and controls (n=80). Logistic regression analysis was done to calculate odds ratios (OR) and (95%) confidence intervals (CI). Microarrays coupled with Ingenuity Pathway Analysis (IPA) was done to determine the differentially expressed genes and networks of T2DM in AA. TaqMan Low-Density Arrays (TLDA) were done to validate our genes of interest in three categories: metabolic disease and disorders, cancer-related genes, and neurobehavioral disorder genes (n=24). Our data revealed that 18 genes among which genes APC (p-value 0.0481), SOD2 (p-value 0.0277), and TP53 (p-value 0.0116) (all cancer related) were differentially expressed in T2DM participants compared to controls. A statically significant association was found between these cancer-related genes and the factors, viz., working status, gender, HbA1c level, elevated BMI, hypertension, and tobacco smoking in AA participants residing in Washington DC. The outcome of the study emphasizes a need for better management of T2DM, limiting tobacco smoking, and large-scale population-based studies of the T2DM association with other disease pathways, including cancers.

Category: 4.0 - Clinical and Translational Minority Health and Health Disparities Research - 4.01 - Clinical and Translational Science Research - RESEARCH ABSTRACT

Grant Support: This study is supported by U54 MD007597-31-5959 grant (PI/PD: Southerland, Lead PI: Ghosh) of NIMHD (NIH)

HAWAII COVID-19 HOSPITAL FATALITY RATES IN RACE/ETHNICITY

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Abstract

PURPOSE: The coronavirus disease 2019 (COVID-19) pandemic has exposed the stark health disparities experienced by underrepresented ethnicities/races. Patient care in hospitals can provide patterns of healthcare delivery and utilization, highlighting differences in healthcare practices across the US. This study describes the hospital fatality rates (HFR) among the different race/ethnic groups in a major tertiary care hospital in Hawaii. METHODS: This is an observational study of patients seeking care at The Queen's Health System, Hawaii's largest tertiary care provider between February 2020 and August 2022. We investigated the association of HFR with self-reported race/ethnicity. SARS-CoV-2 infection was confirmed at the time of admission. HFR was assessed by dividing the COVID-related deaths per all COVID-related hospitalizations. Data were grouped by self-reported race/ethnicity: White, Native Hawaiian, other Pacific Islander (PI), Filipino, Japanese, Chinese, other Asian (mostly southeast Asian), Black, and Others, consistent with the Hawaii Department of Health classifications. RESULTS: A total of 5,900 medical records were included. Duplicated encounters and related data issues reduced the study population to 5,494 medical records. The highest HFR was seen among other Asians (15.93), followed by Chinese (15.75), Japanese (12.81), Filipino (12.69), Native Hawaiian (10.78), PI (10.27), and White (8.3). There was a strong association between vaccine status, age, and HFR among all race/ethnic groups. CONCLUSION: Among SARS-CoV-2 confirmed hospitalizations, underrepresented minorities had higher HFR than Whites. Age was a strong predictor of HFR among all groups and COVID vaccination status was strongly associated with decreasing HFR. Disparities in HFR warrant further investigation into how these inequities can be addressed.

Category: 4.0 - Clinical and Translational Minority Health and Health Disparities Research - 4.01 - Clinical and Translational Science Research - RESEARCH ABSTRACT

Grant Support: NIH 2U54MD007601-36

ENSEMBLE MACHINE LEARNING AS A TOOL TO PREDICT LOW-LEVEL LEAD EXPOSURE IN METRO ATLANTA CHILDREN

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Abstract

Objectives: Current lead exposure prevention efforts, including county and state-wide policies and programs, target large geographic areas for intervention. Primary prevention of low-level lead exposure in children might be supported using a geographically high-resolution predictive modeling approach. Methods: A sample of 92,792 urban and suburban children ≤5 years of age from the metro Atlanta region was curated from the Georgia Department of Public Health Healthy Homes and Lead Prevention Program database for lead exposure between 2010 and 2018. A raster stack with ~1 km2 cells was created, including the number of children with venous blood lead levels (BLLs) ≥2 to <5µg/dL (sub-clinical) and ≥5µg/dL (clinical) in each cell and 12 predictors. An ensemble machine learning approach, including a generalized linear mode, a gradient-boosted machine, and a deep neural network, was used to predict the number of children within each BLL category, sub-clinical and clinical, in each raster cell. Permutation-based predictor importance and partial dependence plots were used to interpret the final ensembles for sub-clinical and clinical BLLs. Maps of predicted vs. observed raster cell values are presented to compare model performance visually. Results: Most important predictors for sub-clinical and clinical BLLs were similar, including an Environmental Protection Agency Toxic Release Inventory for air-based toxic release facility density (positive association), percent of the population below the poverty threshold (positive association), percent of the population that is White (negative association), a crime index (positive association) and road network density (positive association). The predictive values for sub-clinical and clinical BLLs generally matched the observed values. Conclusions: High-resolution geographic prediction of lead-exposed children using ensemble machine learning is a promising approach to support lead prevention efforts.

Category: 4.0 - Clinical and Translational Minority Health and Health Disparities Research - 4.03 - Environmental Science - RESEARCH ABSTRACT

Grant Support: Pediatric and Reproductive Environmental Health Scholars - Southeastern Environmental Exposures and Disparities (PREHS-SEED) – K12 Award NIH/NIEHS K12ES033593

DEVELOPING AN ANIMAL MODEL TO EVALUATE MYCOPHENOLIC ACID-INDUCED DIARRHEA

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Abstract

Abstract: Purpose: Gastrointestinal side effect is a serious concern of mycophenolic acid (MPA), an active metabolite of the prodrug mycophenolic mofetil (MMF) that is used as an immunosuppressive agent in clinical settings. The purpose of this study is to optimize animal models to mimic the symptom MPA-induced diarrhea (MID) in humans for future antidiarrhea efficacy screening. Method: F344 rats were used to develop the model, fecal conditions and body weigh were evaluated every day after administration of MMF, histological exam was conducted to evaluate the intestinal tissue damages. The exposure of MMF and its metabolites in rats' tissues were evaluated using LC-MS/MS method. Results: The result show that the MID was dose-depend in rats, diarrhea occurred from day 4, and all the rats became severe diarrhea on day 8 and day 9, then recovered on day 11, only 50% of rats showed MID with a lower dose of MMF, and no rats survived with 100 mg/kg of MMF; significant differences in MMF-induced diarrhea severity were observed with the female rats as they experienced greater GI side effects than the male rats. The PK profile of MPA and MPAG, the concentration of MPA and MPAG on day 6 was higher than on day 3. Additionally, the tissue exposure was 4-fold higher in the intestine in female than that in male. Conclusion. A rat model for MID was successfully developed with appropriate diarrhea grade, body weight loss and tissue damage.

Category: 4.0 - Clinical and Translational Minority Health and Health Disparities Research - 1.06 - Infectious and Immunological Diseases (non-HIV)4.04 - Pharmaceutical Sciences / Pharmacokinetics / Drug Discovery and Delivery - RESEARCH ABSTRACT

TRAINING AND STRATEGIES FOR RESEARCH DISSEMINATION TO COMMUNITY

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Abstract

PURPOSE Sharing research findings to past research participants and the community at large is necessary to progress along the translational continuum and improve health outcomes. Understanding the impact of dissemination to these individuals especially from the basic science perspective is limited. The Meharry Community Engagement Core's (MCEC) mission is to reduce health and healthcare disparities and a major focus is community research dissemination. We describe a training and strategies used by basic and population health scientists for research dissemination to community. METHODS The MCEC faculty and staff developed a dissemination training and strategies for basic and population health scientists. For each activity, a researcher was partnered with a member of the MCEC who guided them through the process. Each activity has prescribed guidelines and annotated templates. Additionally, competencies have been developed for researchers to conduct the activities and recommendations for evaluation. RESULTS The dissemination training content includes the history of translational research and the role of dissemination, the process, strategies, and tips for effective dissemination. An example of a competency is understanding the intersection of community engagement, population health, and basic science to disseminate results effectively. To date, the MCEC has implemented one dissemination training, three listening sessions, one Facebook live segment, two newspaper articles, and nine quarterly featured abstracts in a monthly community newsletter. The training, strategies, and activities were reviewed and approved by MCEC CAB. DISCUSSION / CONCLUSION These activities can be used by basic and population health scientists and academic institutions as models to guide their community engaged research dissemination activities. Our next steps are to conduct more researcher trainings and further develop strategies with CAB input.

Category: 4.0 - Clinical and Translational Minority Health and Health Disparities Research - 4.01 - Clinical and Translational Science Research - RESEARCH ABSTRACT

Grant Support: This work is supported by National Institute on Minority Health and Health Disparities (#3U54MD007586).

ANTIOXIDANT AND ANTIINFLAMMATION EFFECTS OF HESPERETIN THROUGH NRF2 ACTIVATION AND NF-KB SUPPRESSION IN LPS-ACTIVATED BV-2 MICROGLIAL CELLS

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Abstract

The prevalence of neurodegenerative diseases is becoming more prevalent as the population ages. Among multiple causes, neuroinflammation and oxidative stress play a key role in the progression of these diseases. PURPOSE: This study evaluates the effect of the flavonoid hesperetin (HST) on LPS-activated BV-2 microglial cells. METHODS: cytotoxicity assays, antioxidant mediator assays for catalase (CAT), superoxide dismutase (SOD), and glutathione, PCR arrays to screen genes associated with oxidative stress, RT-PCR using specific primers for Nrf2, Keap1, and NF-kB signaling pathway-associated genes, and western analysis. RESULTS: cell viability results showed that HST was not toxic after 48h treatment in combination with LPS. CAT and SOD enzymatic assays showed that HST induced CAT and SOD expression after 48-h treatment, compared to LPS treatment. The same effect was obtained in glutathione assays, indicating that HST induced the expression of glutathione on LPS-activated BV-2 cells. The oxidative stress PCR arrays showed that HST modulated various genes that regulate oxidative stress. HST down-regulated mRNA expression of ERCC6, NOS2, and NCF1, which participate in excessive oxidative stress processes and exacerbated inflammatory states, and up-regulated HMOX1. The RT-PCR results also showed that HST downregulated mRNA expression of genes associated with NF-kB signaling and induced Nrf2 mRNA expression, which is involved in the transcription of several antioxidant genes. Western analysis confirmed results from RT-PCR on the protein level. CONCLUSION: Hesperetin's modulation of oxidative stress and neuroinflammation on microglia may indicate the possible use of this compound to prevent or slow the progression of neurodegeneration.

Category: 4.0 - Clinical and Translational Minority Health and Health Disparities Research - 4.04 - Pharmaceutical Sciences / Pharmacokinetics / Drug Discovery and Delivery - RESEARCH ABSTRACT

Grant Support: National Institute of Minority Health and Health Disparities of the NIH U54 MD007582.

THE SYNERGISTIC ANTITUMOR EFFECT OF IRINOTECAN AND FLAVONOIDS ON HUMAN COLON CANCER XENOGRAFT MICE

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Texas Southern University (JDG, AW, IE, TD, SG, YZ)

Abstract

PURPOSE: Camptothecin (CPT)-11 (irinotecan) is one of the first-line therapeutic agents in the treatment of metastatic colorectal cancer, but its efficacy and safety can be compromised because of its severe side effects, such as gastrointestinal injury/inflammation and severe diarrhea. Previous studies reported that natural flavonoids such as wogonin and chrysin have anticancer and anti-diarrheal activities. This study aims to investigate the efficacy and safety of irinotecan when co-administered with flavonoids in human colon cancer xenograft model. METHODS: Xenograft model has been established using human HT-29 cell line. When the tumor volume was around 500-600 mm3, the flavonoids mix (wogonin/chrysin) was administered by oral gavage at 100mg/kg/day for three days and then co-administered with CPT-11, intraperitoneally, at two different doses i.e., 50 mg/kg and 75mg/kg per day for seven consecutive days. RESULTS: Our study demonstrated that the tumor volume decreased 36 % with the treatment of 50 mg/kg CPT-11 plus 100mg/kg/day wogonin/chrysin and 57 % with 75 mg/kg/day CPT-11 plus 100mg/kg/day wogonin/chrysin compared to conventional irinotecan treated animals with no major impact on body weights. Interestingly, female mice showed a 2-fold decrease in tumor volume compared to monotherapy group and is statistically significant with $p<0.05$. This confirms the previous reports that females mount a more robust cellular and humoral response, resulting in greater anti-tumor efficacy. DISCUSSION / CONCLUSION: Taken together, our data show that CPT-11 and flavonoids (wogonin and chrysin) exhibit a gender-specific synergistic anti-tumor effect and can be safely administered together for metastatic colon cancer treatment. Therefore, this combination therapy could be a promising approach in anti-tumor chemotherapy for better clinical outcomes.

Category: 4.0 - Clinical and Translational Minority Health and Health Disparities Research - 4.04 - Pharmaceutical Sciences / Pharmacokinetics / Drug Discovery and Delivery - RESEARCH ABSTRACT

Grant Support: NIGMS grant award 1SC2GM135111-01, NIMHD grant award U54MD007605, CPRIT grant RP180748 and RCMI – CBMHR

EPIDEMIOLOGICAL INVESTIGATION ON DEVELOPMENTAL DYSLEXIA WITH ATTENTION DEFICIT AND HYPERACTIVITY DISORDERS IN SCHOOL GOING CHILDREN OF PAKISTAN

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Comsats University, Islamabad, Pakistan (SH, MA), Howard University, USA (TM, SN, SG)

Abstract

Purpose: Developmental Dyslexia (DD) and Attention-Deficit/Hyperactive Disorder (ADHD) are the common neurodevelopmental disorders in children and have limited genetic information available for these disorders. In Pakistan, 10-18% Children suffer from learning disabilities. To gain population insights, primary epidemiological cross-sectional study was conducted and is reported here. METHODS: Participants were recruited from different cities of Pakistan, who have DD and ADHD (n= 260 sporadic cases; Male, n=168, Female, n=92). Background information were obtained from parents (through questionnaire) and child psychiatrists. Clinical evaluation includes Slosson Intelligence Test, WIAT-4 test, The Conners Comprehensive Behavior Rating Scale, and BASC assessment. Complete blood panel, MRI and EEG in participants were recorded. The Chi-square test was applied for statistical significance. RESULTS: Participants mean age was 14 (±2.8) years. The percent of affected children those are born of consanguineous marriages and C-section birth rates were both significantly high (81.53% and 91.53%, respectively). Vitamin D deficiency (61.15%), high blood glucose level (90.76%), and impaired thyroid functions (4.2%) were observed among affected children. In 68.46% of the most severe cases, the vitamin D level was 10 ng/ml. The demographic factors i.e., age, gender, literacy, and residence area, including biological conditions are non-significant in DD and ADHD children. Overall, Vitamin D deficiency and C-section mode of delivery had a significant ($p<0.05$) influence with DD and ADHD development/progression in school going children. DISCUSSION: Our studies indicate consanguineous marriages, severe deficiency in Vitamin D and C-section delivery are significantly associated with severity of these disorders in our population. Further studies of these variables on gene expression changes, molecular studies will be performed, focusing on pathway discovery and identification of mutations/SNPs.

Category: 4.0 - Clinical and Translational Minority Health and Health Disparities Research - 1.09 - Neuroscience and Mental Health4.01 - Clinical and Translational Science Research - RESEARCH ABSTRACT

Grant Support: 5G12MD007597-25 (NIMHD, USA), 1-8/HEC/HRD/2022/12637 (HEC, PAK), 7 R21 MH124294, NIMH (S.N.)

SAFFRON AS AN ADJUVANT THERAPY IN ULCERATIVE COLITIS PATIENTS AND ITS ANTI-TNF-A/IL6/ROS MECHANISMS

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Abstract

Background: Stool calprotectin (CAL) is a golden marker for diagnosis of Inflammatory bowel diseases (IBD), as it increases reactive oxygen species (ROS) levels. Saffron has anti-inflammatory, and antioxidant properties. Aim: We studied saffron's anti-inflammatory effect and its potential to improve CAL levels in ulcerative colitis (UC) patients.Methods: We conducted an open-label pilot study at Howard University, administering 50mg of saffron twice a day for 8 weeks to three UC and one placebo patient. We compared inflammatory markers like CRP, stool CAL, and cytokines from PMA/ionomycin stimulated PBMCs before and after 8 weeks of saffron treatment. We used Partial Mayo scoring index, administered Health-related quality of life and Hamilton Depression Rating Scale questionnaires for clinical assessment. Also evaluated gut microbiome using 16SrDNA analysis on stool DNA.Results: Our study found, saffron treatment led to decrease in pro-inflammatory (TNFα, INF-γ, IL-6, IL-2, IL-17a), and an increase in anti-inflammatory (IL-10 and TGF-β) cytokines, along with reduced fecal CAL and serum CRP levels in patients with UC. Interestingly, we found that a washout period of 8 weeks increases CAL levels whereas, a second cycle of saffron treatment decreases CAL levels in two UC patients and placebo control did not show any changes in CAL levels.Furthermore, In-silico analysis showed saffron interacts with IL-6 and ROS producing enzymes, suggesting its anti-inflammatory effect through interactions with IL-6, NOS1/2, NOX1, NRF2, AhR,GxP2 proteins. Also, 16S rDNA analysis revealed a decrease in gut gamma Proteobacteria and an increase in Ruminococcaceae in UC patients following treatment with saffron.Conclusion: Our study found, saffron can lower inflammation and CAL levels in patients with mild to moderate UC by down-regulating oxidative enzymes, TNF-α/IL-6, and modulating the gut microbiome. The order of events and synergy with saffron-associated mechanisms requires further research.

Category: 4.0 - Clinical and Translational Minority Health and Health Disparities Research - 4.01 - Clinical and Translational Science Research - CLINICAL PRACTICE ABSTRACT

Grant Support: NCI R01CA258519 (HA)

PHARMACOKINETIC CHARACTERIZATION OF A NOVEL COVID-19 INHIBITOR OJT010 IN A RAT MODEL

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Abstract

Purpose: Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) is the etiological agent responsible for the COVID-19 global pandemic. We identified a novel compound, OJT010, as an inhibitor of the host receptor ACE2 that is required for SARS-CoV-2 viral entry into the host cell. Methods: Single dose crossover pharmacokinetic studies were conducted in jugular vein cannulated adult male Sprague Dawley rats to evaluate oral bioavailability of OJT010. Multiple dose steady-state pharmacokinetic studies were further conducted in the rats to evaluate the drug accumulations in the lungs. Serial timed blood samples were collected before and after dose administration. Plasma concentrations of OJT010 were measured using liquid chromatography with tandem mass spectrometry (LC-MS/MS). Pharmacokinetic parameters were obtained using WinNonlin program. Results: Following a 50 mg/kg IV administration, OJT010 showed a bi-exponential disposition with a mean terminal half-life of 7.3 hours. Mean maximum plasma concentration (Cmax) was 2560 ng/mL at 25 min after a

single 250 mg/kg oral dosing. Absolute oral bioavailability of OJT010 was 15.5%. In another set of study, Cmax was 2176, 827 and 1118 ng/mL following a single oral 250 mg/kg, a daily oral 250 mg/kg for 5 days, and a daily oral 400 mg/kg for 5 days administration, respectively. A dose-normalized Turkey post hoc analysis showed significant decrease in Cmax between the single versus multiple 250 mg/kg oral dosing (P=0.05). The observed decrease of drug exposure following multiple administration was probably due to self-induced hepatic drug metabolism. Interestingly, we observed significant accumulation of the drug in the lungs with an average ratio of Clung/Cplasma at 17.7. Further studies are ongoing to explore mechanisms of the unique tissue drug disposition and metabolism using PBPK modeling. Conclusion: Pharmacokinetics of OJT010 were characterized using rat as an animal model. The drug appears to accumulate in the lungs.

Category: 4.0 - Clinical and Translational Minority Health and Health Disparities Research - 4.04 - Pharmaceutical Sciences / Pharmacokinetics / Drug Discovery and Delivery - RESEARCH ABSTRACT

Grant Support: This work is supported in part by a NIMHD U54MD007605 grant at Texas Southern University

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A SMALL MOLECULE NLRP3 INHIBITOR IMPROVES LEARNING IN MURINE MODEL OF VASCULAR DEMENTIA

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Abstract

Aberrant activation of the nucleotide binding domain, Leucine rich repeat protein 3 (NLRP3) inflammasome plays a crucial role in the pathophysiology of vascular dementia (VaD). Persistent NLRP3 activation and the resultant low-grade inflammation is linked with age-related cognitive decline in VaD. A variety of natural products including isoliquiritigenin (ILG) have displayed encouraging in vitro NLRP3 inhibitory activity. These natural products, however, are reported to display pleiotropic activity and low chemical, enzymatic stability. Therefore, they are not considered as promising leads for drug development. We obtained energy-minimized structures of ILG and the related chalcones using Hartree-Fock method, 6-31G(d) basis of energy minimization. Iterative structural alterations led to the development of a novel small molecule NLRP3 inhibitor. Structural features in ILG necessary for the biological activity were preserved in the design of the NLRP3 inhibitor. The novel NLRP3 inhibitor downregulated NLRP3 and inducible nitric oxide (iNOS) synthase expression in vitro. It inhibited caspase-1 and NO production and suppressed inflammation markers, IL-1b and TNF-a. It mediated phagocytosis in the N9 microglia and helped maintain the microglial morphology. It was well tolerated by the microglial cells and did not affect the cell viability at the therapeutic concentration. Administration of the inhibitor in vivo suppressed the LPS-stimulated Iba1+ cells in the cerebral cortex. Finally, using Morris water maze test, we demonstrated the beneficial effects of the inhibitor in improving spatial learning in mouse model of vascular dementia. Together, these results indicate that the potential of a small molecule in reducing neuroinflammation in vitro and in vivo. Our current drug discovery efforts using AMS-17 as a lead molecule will be discussed.

Category: 4.0 - Clinical and Translational Minority Health and Health Disparities Research - 4.04 - Pharmaceutical Sciences / Pharmacokinetics / Drug Discovery and Delivery - RESEARCH ABSTRACT

Grant Support: NINDS R21 award (1R21NS129478-01), RCMI admin supplement (3U54MD007597-34S2)

TARGETED DELIVERY OF DOXORUBICIN LIPOSOMES TO HER-2+ BREAST CANCER CELLS

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Abstract

Purpose: The adverse side effects and toxicity caused by the non-targeted delivery of doxorubicin has emphasized the demand of emerging a targeted delivery system. The goal of this study is to enhance the delivery of doxorubicin by formulating an aptamer-labeled liposomal nanoparticle delivery system that will carry and deliver doxorubicin specifically into Her-2+ breast cancer cells. Methods: Twelve liposomal batches were prepared using different saturated (HSPC and DPPC) and unsaturated (POPC and DOPC) lipids by thin film hydration. The liposomes were characterized for their particle size, zeta potential, and drug encapsulation efficiency. The particles were also assessed for in

vitro toxicity and DOX delivery into the breast cancer cells. Results: The formulations, F1 through F12, had a small particle size of less than 200 nm and a high entrapment efficiency of about 88±5%. The best formulation, F5, had a particle size of 101±14 nm, zeta potential of 5.63±0.46 mV, and entrapment efficiency of ≈93%. The cytotoxicity studies show that the DOX-loaded liposomal formulations are more effective in killing cancer cells than the free DOX in both MCF-7 and SKBR-3 cells. The uptake studies show a significant increase in the delivery of DOX by aptamer-labeled F5 into Her-2+ breast cancer cells compare to non-aptamer-labeled nanoparticles. Conclusions: This preliminary study indicates that aptamer-labeled F5 nanoparticles among several batches showed the highest uptake as well as the targeted delivery of doxorubicin into Her-2+ breast cancer cells. Thus, aptamer targeted approach results in substantial reduction in the dose of DOX and improves the therapeutic benefits by promoting the target specificity.

Category: 4.0 - Clinical and Translational Minority Health and Health Disparities Research - 4.04 - Pharmaceutical Sciences / Pharmacokinetics / Drug Discovery and Delivery - RESEARCH ABSTRACT

Grant Support: IDeA Grant from the NIGMS under grant number P20 GM103424-17; Louisiana Board of Regents grant; NIH Score 3 grant, and RCMI, LCRC, CUR, BUILD and NSF.

BRMOCRIPTINE OVERCOMES PROSTATE CANCER CHEMORESISTANCE

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Abstract

PURPOSE: Prostate cancer (PCa) exhibits the first morbidity and the second mortality in American men, and it disproportionately affects African Americans. Chemoresistance is a major obstacle in the clinical management of advanced PCa, so it is imperative to develop novel strategies to overcome chemoresistance and improve clinical outcomes in patients who have failed chemotherapy. METHODS: A high-throughput phenotypic screen we recently established was used to screen the inhibitors of chemoresistant PCa cells. The selectivity and potency of bromocriptine against chemoresistant PCa were validated in chemoresistant PCa cells and their chemosensitive counterparts using in vitro viability assay. The mechanism of action of bromocriptine was investigated in chemoresistant PCa cells using molecular and cellular approaches. The in vivo efficacy of bromocriptine was evaluated in the animal model with chemoresistant PCa xenografts. RESULTS: We identified bromocriptine as a potent and selective inhibitor of chemoresistant PCa cells. Bromocriptine effectively induced cell cycle arrest and apoptosis in chemoresistant PCa cells but not in chemosensitive PCa cells. RNA-seq analyses revealed that bromocriptine affected a subset of genes regulating cell cycle, DNA repair, and cell death. At the protein level, bromocriptine increased the expression of dopamine D2 receptor (DRD2), which is downregulated in chemoresistant PCa cells, and affected several classical and non-classical dopamine receptor signal pathways. As a monotherapy, low dose bromocriptine significantly inhibited the skeletal growth of chemoresistant PCa xenografts in athymic nude mice. CONCLUSION: These results provided the first preclinical evidence that bromocriptine is a selective and effective inhibitor of chemoresistant PCa. Due to its favorable clinical safety profiles, bromocriptine could be rapidly tested in PCa patients and repurposed as a novel subtype-specific treatment to overcome chemoresistance.

Category: 4.0 - Clinical and Translational Minority Health and Health Disparities Research - 4.04 - Pharmaceutical Sciences / Pharmacokinetics / Drug Discovery and Delivery - RESEARCH ABSTRACT

Grant Support: National Cancer Institute 1R01CA256058-01A1 and 2R42CA217491-02A1, National Institute on Minority Health and Health Disparities Research Center in Minority Institute 5U54MD007590

NANOEMULSION FORMULATION DEVELOPMENT AND CHARACTERIZATION OF PC257, A NOVEL ANTI-CRPC AGENT

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Abstract

In 2022 the National Cancer Institute reports that prostate cancer accounted for 14 percent of overall new cancer occurrences with a 5.7% death rate. Early detection provides high survival and remission rates; however, there are limited options for castration resistant prostate cancer (CRPC). Current treatment strategies for CRPC exploit the dependence of AR for hormone activation, but the available therapies are ineffective in FKBP52 cochaperone, which is a promising therapeutic target for the disruption of multiple mechanisms in prostate cancer. PC257 was developed as an inhibitor of novel targets such as FKBP52 by Dr. Marc Cox's group at UT-El Paso. In this study, we developed a non-hemolytic nanoemulsion formulation of PC257 for parenteral administration. A nanoemulsion would increase the drug's bioavailability while efficiently delivering the drug to the targeted site. A nanoemulsion formulation of PC257 was prepared using a low energy stirring/heat inversion method to combine an oil phase and water phase for the final nanoemulsion. PC257 is added at various formulation phases to achieve optimal drug concentrations. The nanoemulsion was characterized for particle size, zeta potential, encapsulation efficiency, and drug loading. Zeta Sizer data for unfiltered and filtered emulsions both have mean PDI of 0.289 +/- 0.034, Z-Average of 210.33 +/- 25.53 d.nm, and Zeta potential of -20.02 +/- 5.27 mV. NanoDrop UV-Vis shows an absorbance of the compound between 280 to 300 nm range. Preliminary UPLC data shows a concentration of 190.95 ug/mL with 10% drug loaded. Further development of this nanoemulsion is undergoing in our lab.

Category: 4.0 - Clinical and Translational Minority Health and Health Disparities Research - 4.04 - Pharmaceutical Sciences / Pharmacokinetics / Drug Discovery and Delivery - RESEARCH ABSTRACT

Grant Support: National Institute on Minority Health and Health Disparities of the National Institutes of Health (NIH) under award number 2 U54 MD007605-27A1.

TGF-B1 SIGNALING PATHWAYS IN PROGRESSION NON-ALCOHOLIC FATTY LIVER DISEASE IN AFRICAN AMERICANS

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Abstract

Background: The non-alcoholic fatty liver disease (NAFLD) is the most common chronic liver disease globally and is a concern among African Americans (AA) in the United States because of health disparities. TGF-β1, one of the three isoforms of TGF-β family has significant role in HSC activation and extracellular matrix production, which further contributes to the progression of NAFLD. Current study aims at the role TGF-β1 pathways in the progression of NAFLD and the downstream comorbidities among AA individuals. Methods: A total of 47 AA individuals (NAFLD=23, Healthy control=24) were enrolled in our study. Sociodemographic, lifestyle exposures and medical information were recorded. Global gene expressions for transcriptional analysis were performed coupled with Ingenuity Pathway Analysis (IPA®) to understand the major disease pathways involved and the progression of NAFLD disease mechanism. Results: The differentially expressed genes revealed that 67.4% and 32.5% of genes were significantly (p-value <0.05) up- and downregulated respectively. Downregulation of TGFB1 highlighting Hepatic Fibrosis Signaling Pathway, Hepatic Fibrosis, Hepatic Cholestasis were the top canonical pathways (p-value <0.0001), that corresponds to top bio-functions, viz., Proliferation of hepatic satellite cells, Progressive hepatic fibrosis, and Acute-Chronic Liver failure. The study emphasized Liver Inflammation, Liver Cirrhosis, among top toxicological outcome with an indication of developing liver cancer in the future. Conclusion: The genes in networks which are dysregulated in AA patients with NAFLD gave us a correct understanding about advancing our knowledge in developing biomarker to detect possible risks and the disease state.

Category: 4.0 - Clinical and Translational Minority Health and Health Disparities Research - 1.03 - Diabetes, Obesity, and Metabolic Syndromes4.01 - Clinical and Translational Science Research - RESEARCH ABSTRACT

Grant Support: The study funded by a P20 grant (CA262617-01) (PI: Dr. Ghosh) from the NCI (NIH)

HDPULSE: A RESOURCE TO ADVANCE MINORITY HEALTH AND HEALTH DISPARITIES RESEARCH AND PRACTICE

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NIH
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National Institute on Minority Health and Health Disparities

Abstract

Access to data and intervention repositories are important to researchers, public health practitioners and community members. These resources help characterize a disease burden and stimulate uptake of evidence-based interventions, increasing the translation of research into clinical or community practice. Unfortunately, there is limited access to comprehensive, complete and high-quality data, and effective interventions for improving minority health and health disparities. HDPulse, developed by the National Institute on Minority Health and Health Disparities, is a website that aims to provide easy access to data and interventions to help move minority health and health disparities research into practice. HDPulse includes a Data Portal and an Interventions Portal to identify, quantify, and visualize health disparities, and explore effective interventions. Both portals separately underwent usability testing to improve user experience and utility of data and interventions provided. The Data Portal utilizes publicly available U.S. population health data at county, state, and national levels and includes topics such as health outcomes and determinants. The Interventions Portal includes research-tested interventions that are reviewed/verified for relevance and rigor. User testing and feedback recognize HDPulse as a novel, valuable resource for a range of audiences interested in minority health and health disparities. HDPulse bridges a crucial gap unaddressed by other resources, having a central place to access various data and interventions on minority health and health disparities. HDPulse uses a socioecological framework to organize data topics and provides a database of searchable research-tested interventions that are accompanied by supporting evidence and implementation materials. The goal of HDPulse is to move minority health and health disparities research findings into community and clinical practice thereby advancing the translation of research into practice.

Category: 4.0 - Clinical and Translational Minority Health and Health Disparities Research - 4.01 - Clinical and Translational Science Research - RESEARCH ABSTRACT

COVID-19 & FLU TESTING STRATEGIES IN THE COMMUNITY

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Abstract

PURPOSE: The COVID-19 pandemic has had a significant impact on communities worldwide. Testing is a crucial tool in the fight against viral spread. Studies have shown that minority and medically underserved communities are associated with lower vaccination rates and higher COVID-19-related morbidity and mortality. While the pandemic has increased the awareness of diagnostic testing in the general population, little is known about how medically underserved minority communities perceive and experience testing. The goal of this study is to increase the awareness and adoption of COVID-19 and flu testing in a medically underserved community in East Harris County, Texas. The objectives are 1) to understand the perception of testing commutable diseases like COVID-19 test and COVID-19 and flu combined test, 2) to implement testing strategies in collaboration with the community. METHODS: A community engagement group was formed to guide participant recruitment and project implementation strategies. Residents in the East Harris Counties who are aged≥ 18 years or older are eligible to participate in the study. Participants' demographic information, perception, and histories of vaccination and testing were collected through a questionnaire. RESULTS/ EXPECTED RESULTS: A total of 125 individuals completed the questionnaire from Sept 2022-March 2023. Our findings suggest that while participants recognized the role of COVID-19 testing, there were significant barriers to access and uptake of testing, including concerns about fear of painful sampling, inconvenience, and a lack of trust in the healthcare system. Participants also expressed a desire for clearer information about testing and more accessible testing sites. On the other hand, with flu testing, our participants have less experience, many of whom were never been tested for flu in the past. DISCUSSION/ CONCLUSION: Our study highlights the need for targeted community education to increase the uptake of COVID-19 and flu testing.

Category: 4.0 - Clinical and Translational Minority Health and Health Disparities Research - 4.05 - Public Health Preparedness for Natural Disasters - CLINICAL PRACTICE ABSTRACT

Grant Support: Research reported in this RADx® Underserved Populations poster was supported by the National Institutes of Health under Award Number [R401A, including CDCC grant number (U24MD016258) for consortial data, data management, and/or analysis support].

ADVERSE EFFECTS OF ELECTRONIC CIGARETTES ON SKELETAL MUSCLE

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Abstract

PURPOSE: Electronic cigarettes (E-Cig) are a new way to deliver nicotine (Nic). E-Cigs are popular, especially among youth and young adults, who don't realize their harmful health effects, because there is a lack of information. We demonstrated the adverse effects of E-Cigs on the liver and the heart. Skeletal muscle has physical and metabolic importance fundamental for health. We previously reported that IP injection of Nic with a "second-hit" such as a high-fat diet (HFD) caused skeletal muscle damage. This study evaluated the detrimental effects of E-Cigs administration on skeletal muscle. METHODS: C57BL6 mice were fed with an HFD and exposed to E-Cig commercially available E-Cig (bluCig PLUS) in a similar way to humans without Nic (E-Cig 0%), E-Cig with Nic (E-Cig 2.4%), or saline solution (control) for 12 weeks. RESULTS: The skeletal muscle exposed to E-Cig 2.4% reduced the phosphorylation of the metabolic regulator, AMPK, and the pro-lipolytic enzyme ATGL compared to saline and E-Cig 0% groups. This metabolic impairment was accompanied by a reduction of the homeostatic mechanism, autophagy by a decrease of the ratio LC3II/LC3I, in the group exposed to E-Cig 2.4% in relation to the saline group. Electron microscopy showed intramyofibrillar mitochondrial with cristolysis, vacuolization, and intramyocellular lipid deposits in the E-Cig 2.4% group. Next, the antioxidant enzyme HO-1 is increased in the E-Cig 2.4%, and the antioxidant enzymes SOD1 and SOD2 have reduced their protein levels. Finally, the previous changes trigger the activation of cellular stress pathways such as the phosphorylation of p38 and the increase in inflammasome protein, Nrlp3 in the E-Cig 2.4% compared to the saline group. CONCLUSIONS: This study suggests skeletal muscle abnormalities in mice vaping E-Cig 2.4% by altering muscle health. We believe these abnormalities can have bigger consequences in the skeletal muscle considering the early life stage of the consumers.

Category: 4.0 - Clinical and Translational Minority Health and Health Disparities Research - 4.01 - Clinical and Translational Science Research - RESEARCH ABSTRACT

Grant Support: GRANT SUPPORT: Pilot grant was supported by the National Institute of Minority Health and Health Disparities funded CDU Accelerating Excellence in Translational Research (AXIS) Center under award number U54MD007598 to JCR; NIGMS grant (SC2GM135127), NIMHD Grant (S21-MD000103), voucher support from the NIH Accelerating Excellence in Translational Science (AXIS) grant (5U54MD007598) to J.E-D.; NIGMS grant (SC2GM125551) to K.H.; NIH R25 DA050723, California TRDRP grant # 28CP-0040, and DOD CDMRP grant PR190942 to T.C.F.

EXAMINING THE ROLE OF A WHOLE FOOD, PLANT-BASED DIET ON RISK FOR BREAST CANCER IN OBESE POST-MENOPAUSAL AFRICAN AMERICAN WOMEN

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Abstract

Background: Obese postmenopausal African American (AA) women are at increased risk of breast cancer. Obesity and aging have been associated with changes in the gut microbiota. Plant-based diets, such as soy isoflavone consumption may protect against breast cancer development. Methods: A mixed-methods, lifestyle intervention study was conducted to evaluate adoption of a culturally tailored diet and changes in risk for breast cancer among obese, post-menopausal AA women. We examined acceptability and feasibility of adopting a whole-food, plant-based diet and the effect of the diet on reductions in weight, adiposity, inflammation, circulating estrogen, and gut microbiome profile. Results: In 5 focus group discussions, 20 AA women described their knowledge of breast cancer risk factors, attitude toward a plant-based diet, experience with making lifestyle changes, and preferences for plant-based alternatives to traditional meat-based meals. This

feedback was used to tailor the 4-weeks of plant-based meals provided to twenty AA women. Women report being pleased with the whole-food, plant-based selections; document adherence to the meals with food tracking; and experience an average of a 5-pound weight loss. Gut microbiome analysis is underway. Conclusion: This study addresses knowledge gaps in breast cancer risk and behavioral modifications affecting risk among an aging, obese, post-menopausal AA female population. The long-term goal of this program of research will shed light on the mechanisms involved in the gut microbiome, tissue integrity and function with aging, and the contributions of changes to these systems on declining health and function in obese, postmenopausal AA women at risk for breast cancer.

Category: 4.0 - Clinical and Translational Minority Health and Health Disparities Research - 4.01 - Clinical and Translational Science Research - RESEARCH ABSTRACT

Grant Support: National Institute on Aging of the National Institutes of Health under Award Number P30AG031054

HEPATIC STEATOSIS AND CARDIOVASCULAR DISEASE: VARIATION BY RACE/ETHNICITY

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Abstract

Purpose: Hepatic steatosis (HS), a condition where fat accumulates in the liver, that can lead to high hepatic blood pressure, increasing the burden on the heart, causing heart failure (HF). Prevalence of HS and CVD differ by race/ethnicity where Mexican Americans have higher prevalence of HS and African Americans have higher prevalence of CVD. The objective of this study was to investigate the relationship between HS, hypertension and HF in a representative sample of the adult population of USA. Methods: We analyzed data for 8,174 adults 20 years and older from the National Health and Nutrition Examination survey 2009 to 2018. HS was defined using the US Fatty Liver Index. Hypertension was identified using the blood pressure measurement >140/90 mm hg. HF was determined by questionnaire. Data were analyzed using multiple logistic regression adjusting for demographics, behavior, and laboratory variables and considering the sampling design and weight. Results: Of the sampled population, 7.7% were Mexican American, 5.7% were Other Hispanic, and 10.3% were Black. The prevalence of HS, hypertension, and HF were 33.9%, 37.2%, and 1.9%, respectively. Those with HS had higher prevalence of hypertension (55.4%) and HF (3.7%) compared to those with no HS (27.8% and 1%, respectively) ($p<0.0001$). In the multivariable model, HS was independently associated with hypertension among all the racial/ethnic groups except Mexican Americans ($p<0.05$). HS was independently associated with HF among the Other Hispanic group (AOR=4.0, 95% CI=1.9-8.4, $p=0.0004$). Conclusion: Patients with HS should be screened by health care providers to detect HF. Culturally-sensitive interventions are needed to reduce the burden of HS and HF in different racial/ethnic groups. In addition, more research is needed to better understand the underlying causes of these disparities.

Category: 4.0 - Clinical and Translational Minority Health and Health Disparities Research - 4.01 - Clinical and Translational Science Research - RESEARCH ABSTRACT

Grant Support: Accelerating Excellence in Translational Sciences (AXIS) Center - #U54MD007598; R01MD012579, S21MD000103, UL1TR001881

LACTATION COUNSELLORS IN COVID-19 BREASTFEEDING PROMOTION.

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Abstract

PURPOSE: To investigate Certified Lactation Counsellor (CLC) impact on safe breastfeeding promotion during and post COVID-19 pandemic. METHODS: African-American and low-income mothers enrolled from Nashville General Hospital signed IRB approved consent and completed a COVID-19 questionnaire. Postpartum mothers (Group 1) enrolled in 2020, and pregnant mothers enrolled in 2021 (Group 2) and 2022 (Group 3) received COVID-19 safe breastfeeding guidance. Participants were encouraged to request CLC referral, get tested and vaccinated against COVID-19. Follow-up was planned for 1-, 4-, and 6-months postpartum. RESULTS: The ages of 166 participants ranged

from 15 - 45 years, mean 27.6±6.2, and 122(73.5%) having their first or second baby. Group 1 mothers were not working 17(42.5%) compared to 26(25.7%) Group 2, and 6(23.1%) Group 3, p<0.02. Always wearing facemask while shopping and avoiding baby outings was 29(70.7%), 85(84.2%), 12(50.0%), p<0.001, and 5(12.2%), 21(20.8%), 10(41.7%), p<0.02, in Groups 1, 2 and 3 respectively. 1:5 mothers wore facemask when receiving guests or holding their baby. Half of them tested for COVID-19 with positive rate of 5(12.2%), 4(4.0%) and 3(12.5%), and vaccination uptake of 0(0.00%), 8(7.9%) and 3(12.5%), respectively, across the three groups. While 40(24.1%) claimed ignorance about COVID-19 safe breastfeeding, others admitted getting knowledge from providers, media, and reading. Accurate knowledge for those who received breastfeeding education from doctors/nurses versus CLCs was respectively 51(83.6%) versus 29(78.4%). CONCLUSION: Protecting infants against COVID-19 improved from 2020 to 2022. The few mothers in this pilot study who received CLC consult demonstrated excellent COVID-19 safe breastfeeding knowledge and actions. Prenatal care providers should seize this opportunity to actively encourage mothers to breastfeed, promote COVID-19 safe breastfeeding, and routinely refer mothers to CLCs for breastfeeding evaluation, education and training.

Category: 4.0 - Clinical and Translational Minority Health and Health Disparities Research - 4.01 - Clinical and Translational Science Research - CLINICAL PRACTICE ABSTRACT

Grant Support: None

THE IDENTIFICATION OF A BISULFITE ADDUCT OF NI7, AND ITS APPLICATION FOR NI7 QUANTIFICATION

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Abstract

PURPOSE NI7, is a potent inhibitor of NADPH oxidases (NOX) which has recently been identified as a novel agent targeting to triple-negative breast cancer. NI7 is unstable in bio-matrix, and it completely disappeared in mouse whole blood samples in 10 days stored under -70°C. In the present study, a stabilized form of NI7, NI7 bisulfite adduct, was identified, and it was successfully applied for NI7quantification using LC-MS/MS. METHODS The identification of NI7 and its bisulfite adduct was conducted on an X500B QTOF mass spectrometer (SCIEX, Framingham, MA, USA). TOF-MS and MS/MS data were monitored using the Information-dependent-acquisition (IDA) in negative mode by SCIEX OS software 1.6.1. NI7 quantification via monitoring its bisulfite adduct was conducted on a 6500+ Triple Quad LC-MS/MS System (AB SCIEX LLC, CA, USA) coupled with a Synergi Fusion-RP column (50 x 2 mm, 4 µm, 80 Å, Phenomenex Inc.). The measurement of the analyte and the internal standard warfarin were employed to detect the MRM transition at m/z 340.1 to 127.0 for the analyte and at m/z 307.1 to 160.9 for the IS using negative multiple reaction monitoring (MRM) mode Data were acquired by Analyst software 1.6.3. RESULTS NI7 bisulfite adduct was identified using QTOF MS/MS, and a UPLC-MS/MS method was developed and validated by stabilizing and monitoring NI7 in its bisulfite adduct form. The linearity range of the calibration curves was between 0.5 to 500 ng/mL with regression correlation coefficients > 0.99. The intra-day and inter-day accuracy (RE%) were from -5.58 to 5.18%. The intra-day and inter-day precision (CV%) ranged 3.86 - 12.34%. No significant degradation was occurred under the experimental conditions. CONCLUSION A bisulfite adduct of NI7 was identified, and a UPLC-MS/MS method for the quantification of NI7 in mouse whole blood samples was developed and validated. The method could be applied to NI7 PK studies in mouse whole blood.

Category: 4.0 - Clinical and Translational Minority Health and Health Disparities Research - 4.04 - Pharmaceutical Sciences / Pharmacokinetics / Drug Discovery and Delivery - RESEARCH ABSTRACT

Grant Support: This study was funded in part by the NIH/NIMHD-Research Centers in Minority Institutions Program (U54MD007605), the Cancer Prevention & Research Institute of Texas (CPRIT) Core Facilities Support Awards (RP180748) to DL and HX; and NCI R01CA251206 to S-YL.

DEVELOPMENT OF UPLC-MS/MS METHOD FOR SIMULTANEOUS QUANTIFICATION OF EIGHTEEN ANTIRETROVIRAL AND ANTIFUNGAL DRUGS IN HUMAN PLASMA

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Texas Southern University (TSU)

Abstract

Purpose: HIV treatment has been revolutionized due to highly active antiretroviral treatment. However, in clinical practice, there is lack of therapeutic drug monitoring tools for antiretroviral drugs. The purpose of this study is developing and validating a novel LC-MS/MS assay that simultaneously quantitate plasma concentrations of 15 common antiretroviral drugs and 3 antifungal drugs. Methods: We purchased the purified substances of all 18 analytes from Sigma Co. Stable isotopes of corresponding analytes were purchased if available to be used as internal standard (I.S.). We performed the assay on a 6500+ Triple Quad L.C.–MS/MS System equipped with an ExionLC UHPLC unit (AB SCIEX LLC, CA) and an ACE Excel 2 Super C18 Column (50 × 2.1 mm, 2 µm). The separation of the analytes was achieved on a Waters BEH C18 column. The flow rate was 0.45 mL/min with a gradient of two mobile phases: solution A (Water with 0.1% formic acid) and solution B (acetonitrile). Compounds were detected on AB SCIEX QTRAP 6500 System. The parameters were optimized to maximize sensitivity. Results: We established the UPLC-MS/MS method for simultaneous monitoring of antiretroviral and antifungal drugs. The mean regression coefficient (R2) of the standard curves for all drugs ranged from 0.980 to 0.999, which indicates the calibration curve and dilution integrity. The assay did not show any interference with other concomitant drugs. Conclusions: The UPLC-MS/MS method could be used routinely to monitor plasma concentrations of antiretroviral and antifungal drugs.

Category: 4.0 - Clinical and Translational Minority Health and Health Disparities Research - 4.01 - Clinical and Translational Science Research - RESEARCH ABSTRACT

Grant Support: 2U54MD007605-27A1

ASSOCIATION BETWEEN COMMUNITY-LEVEL ECONOMIC DEPRIVATION AND OUTCOMES OF LOWER EXTREMITY ARTERIAL REVASCULARIZATION

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Abstract

INTRODUCTION: Studies have shown significant disparities in outcomes following lower extremity arterial revascularization (LEAR). Lower socioeconomic status is associated with disproportionately worse outcomes following LEAR. While many reports have explored the association between income or insurance type and outcomes of LEAR, few have examined the influence of community-level economic deprivation. We undertook this study to assess the influence of the Distressed Communities Index (DCI), a validated and robust measure of neighborhood socioeconomic status, on the outcomes of LEAR. METHODS: We examined the Maryland State Inpatient Database (SID) in a retrospective analysis of patients who underwent LEAR for chronic limb-threatening ischemia (CLTI) between January 2018 and December 2020. We used multivariate analyses to determine the association between the Distress Communities Index (DCI), and the outcomes of LEAR (mortality, readmission, amputation, LOS, and post-op MI). DCI uses seven local metrics to generate five levels of socioeconomic distress (prosperous, comfortable, mid-tier, at-risk, and distressed). We controlled for patients' age, sex, preexisting comorbidities, and hospital discharge disposition in our analysis. RESULTS: There were 2504 patients who underwent LEAR for CLTI during the study period. The median age was 68 (IQR: 61-77). This was a primarily White (55.4%), male (57.6%) population. Of patients undergoing revascularization, 48.6% had open surgical revascularization and 51.4 %underwent endovascular procedures. We were unable to identify any association between DCI and the measured outcomes of revascularization in this cohort. Patients who underwent endovascular revascularization however were more likely to undergo subsequent major amputation (OR=2.11;95% CI 1.5-2.93, p<0.001). CONCLUSIONS: We were unable to identify an association between DCI and the measured outcomes of LEAR for CLTI in this state-wide Maryland database.

Category: 4.0 - Clinical and Translational Minority Health and Health Disparities Research - 4.01 - Clinical and Translational Science Research - RESEARCH ABSTRACT

SOCIAL DETERMINANTS OF HEALTH MEDIATE COMORBIDITY BY INCREASING CYTOKINE, WHICH INCREASE THE RISK OF BREAST CANCER INCIDENCE IN AFRICAN AMERICAN AND LATINX WOMEN

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Abstract

PURPOSE: The study tests our hypothesis that disadvantaged neighborhoods and individuals' socioeconomic status could result in a high incidence of comorbidities (obesity (OB), diabetes (T2D), and hypertension (HTN)) in African American (AA) and Latinx women in South Los Angeles (LA). We propose that increased expression of inflammatory cytokines may lead to increased risk for breast cancer incidence, contributing to cancer health disparities. METHODS: 896 AA and Latinx women in South LA and their demographic, comorbidity, and breast cancer information were extracted from our existing clinical database. A panel of 19 cytokines was measured by Luminex assay from women's serum samples. Neighborhoods' social vulnerability index was obtained through Geographic Information Systems. Linear regression and Path analysis were used for the study. RESULTS: 50% of AA and Latinx women were Obese. 30% had T2D, and 36.8% had HTN. Women with obesity, T2D, and HTN had elevated specific groups of cytokines. Comorbidity was associated with the following cytokines: CXCL1, CCL4, CXCL10, TNFα, TGFβ1, and TGFβ2 was also significantly associated with breast cancer diagnosed at ages <50. Obesity was positively associated with diabetes ($p<0.01$). Our path analysis shows that women living in communities with higher proportion of residents below federal poverty level were more likely to have obesity ($p<0.0001$) and HTN ($p <0.05$). Poverty level, education status, and individuals' lifestyle influence TGFβ1 and TGFβ2 through obesity and T2D ($p <0.01$). Similarly, low poverty and education mediate increasing CCL4 through HTN ($p<0.05$). Breast cancer patients with a high level of TGFβ1 and TGFβ2 had reduced 5-year disease-free survival significantly after adjusting for tumor pathology and age. CONCLUSION SDH and comorbidities increase specific cytokines and influence breast cancer incidence and survival in AA and Latinx, contributing to cancer health disparities.

Category: 4.0 - Clinical and Translational Minority Health and Health Disparities Research - 4.01 - Clinical and Translational Science Research - RESEARCH ABSTRACT

Grant Support: NIMHD U54MD007598 and NIH/NCI 1U54CA14393 to Dr. Jay Vadgama, NIMHD U54MD007598 Full Project to Dr. Yanyuan Wu.

ROLE OF OSIMERTINIB, CARP-1 FUNCTIONAL MIMETIC (CFM 4.17) FORMULATION AND TELMISARTAN COMBO TREATMENT IN NSCLC TUMOR XENOGRAFTS

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Abstract

The epidermal growth factor receptor (EGFR) is highly expressed in many non-small cell lung cancers (NSCLC), necessitating the use of EGFR-tyrosine kinase inhibitors (TKIs) as first-line treatments. Osimertinib (OSM), a third-generation TKI, is routinely used in clinics, but T790M mutations in exon 20 of the EGFR receptor lead to resistance against OSM, necessitating the development of more effective therapeutics. Telmisartan (TLM), OSM, and cell cycle and apoptosis regulatory protein 1 (CARP-1) functional mimetic treatments (CFM4.17) were evaluated in this study against experimental H1975 tumor xenografts to ascertain their anti-cancer effects. Briefly, tumor growth was studied in H1975 xenografts in athymic nude mice, gene and protein expressions were analyzed using next-generation RNA sequencing, proteomics, RT-PCR, and Western blotting. TLM pre-treatment significantly reduced the tumor burden when combined with CFM-4.17 nanoformulation and OSM combination (TLM_CFM-F_OSM) than their respective single treatments or combination of OSM and TLM with CFM 4.17. Data from RNA sequencing and proteomics revealed that TLM_CFM-F_OSM decreased the expression of Lamin B2, STAT3, SOD, NFKB, MMP-1, TGF beta, Sox-2, and PD-L1 proteins while increasing the expression of AMPK proteins, which was also confirmed by RT-PCR, proteomics, and Western blotting. According to our findings, the TLM_CFM-F_OSM combination has a superior anti-cancer effect in the treatment of NSCLC by affecting multiple resistant markers that regulate mitochondrial homeostasis, inflammation, oxidative stress, and apoptosis.

Category: 4.0 - Clinical and Translational Minority Health and Health Disparities Research - 4.04 - Pharmaceutical Sciences / Pharmacokinetics / Drug Discovery and Delivery - RESEARCH ABSTRACT

Grant Support: RCMI

5.0 - COMMUNITY-BASED PARTICIPATORY RESEARCH

COMPARING VIRTUAL/HYBRID VS. IN-PERSON SMOKING CESSATION

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Abstract

PURPOSE: CEASE (Communities Engaged and Advocating for a Smoke-Free Environment) is an enduring research collaboration between a university and its neighboring community, with the goal of diminishing tobacco use among disadvantaged communities. A digitized version of the program has been co-designed by CEASE partners and aims to compare the effectiveness of the virtual/hybrid peer-motivation versus a previously tested in-person peer-motivation on smoking cessation outcomes. METHODS: This ongoing program has used a mixed-methods experimental research design. Smoking cessation classes were facilitated by peers and conducted in community settings. To date, 232 current smokers aged ≥ 21 years have been recruited in either virtual/hybrid (using a newly developed website), in-person, or self-help interventions from underserved communities in Baltimore City. Sixty-eight follow-up surveys (virtual/hybrid:36, in-person:4, and self-help: 28) and five focus group discussions have been conducted. RESULTS: The study involved participants with a mean age of 55.4 years (SD = 10.8), consisting of 56% male, 78% African American, and 16% White. The majority of participants (86%) were unemployed, and around 31.2% had not graduated from high school. Of the 68 participants who were followed up, 79.4% reported making quit attempts (abstaining from smoking for over 24 hours) in the past four months, while 13.2% reported successfully quitting smoking. A total of 35 participants participated in 5 focus group discussions (two virtual, two self-help, and one in-person). Constant comparison and thematic coding qualitative analysis delineated themes and revealed three main categories. The main categories were: (1) Health impact of the program on the participants; (2) Experience with the cessation class mode (online, virtual/hybrid); (3) Process of quitting. CONCLUSION: The digitization of CEASE smoking cessation interventions in underserved communities can offer significant insights into culturally

Category: 5.0 - Community-Based Participatory Research - 5.01 Community-Based Participatory Research Addressing Minority Health and Health Disparities - RESEARCH ABSTRACT

Grant Support: This work was supported by the National Institute on Minority Health and Health Disparities RCMI@Morgan #5U54MD013376-8281.

POTENTIALLY INAPPROPRIATE MEDICATION USE IN OLDER LATINO ADULTS

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Abstract

PURPOSE: Trends of medication misuse including non-optimized medication therapy, polypharmacy, and use of potentially inappropriate medications (PIMs) among minority older Latino adults is largely unknown. The objective of this study is to examine the prevalence of PIM use among underserved community dwelling older Latino adults. This study both examines the complexity of polypharmacy in this community and identifies associations between PIM and multimorbidity, polypharmacy, and access to medical care among this segment of our population. METHODS: This community-based cross-sectional study included 126 Latino adults aged 65 years and older. The updated 2019 American Geriatrics Society Beers Criteria was used to identify participants using PIMs. We used multinomial logistic regression to examine the PIM's independent association on several independent variables including demographic characteristics, number of chronic conditions and medications used, level of pain, and sleep difficulty. RESULTS: One-third (34%) of participants had at least one use of PIM. Polypharmacy (≥ 5 medications) was observed in 55% of our sample. Sixteen percent were taking between nine and twenty-four medications, whereas 39% and 46% were taking five to eight and one to four prescription medications, respectively. The multinomial logit regression

analysis shows that (controlling for demographic variables) increased PIM use was associated with increased number of prescription medications, number of chronic conditions, sleep difficulty, lack of access to primary care providers, financial strains and poor self-rated health. DISCUSSION/CONCLUSION: Our data suggest that financial strains, lack of access to primary care, as well as increased number of medications, and multimorbidity are inter-tangled. Therefore, improving access to health care and continuity of care among older Latino adults with multi-morbidity has the potential to reduce health disparities related to both polypharmacy and PIM use.

Category: 5.0 - Community-Based Participatory Research - 5.01 Community-Based Participatory Research Addressing Minority Health and Health Disparities - RESEARCH ABSTRACT

Grant Support: Research reported was supported by the National Institute of Minority Health and Health Disparities under award numbers U54MD007598 and R25 MD007610

TACKLING CHRONIC DISEASES DURING COVID-19 WITH LAY ADVISORS

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Abstract

PURPOSE: The COVID-19 pandemic has disproportionately affected older adults, particularly those with chronic health conditions. To address the challenges faced by under-resourced African American (AA) older adults in South Los Angeles during this time, we implemented a community-based participatory project utilizing COVID-19 Health Ambassadors (CHAs) to assist with chronic disease management and reduce healthcare avoidance behaviors and psychological stress. This study aims to evaluate the intervention's implementation using the Consolidated Framework for Implementation Research (CFIR) as a reporting tool. METHODS: This one-group pre-post community-based intervention study recruited participants through faith-based organizations (FBOs) and consisted of CHA-led sessions educating and supporting older persons in managing their chronic conditions and resolving medication-related challenges. Data collected via stakeholder interviews were used to evaluate the implementation process using CFIR, with an emphasis on fidelity, adaptations, and challenges. RESULTS: The intervention was largely delivered as intended, with CHAs conducting regular educational sessions and follow-up calls to participants. Adaptations made to better suit the needs of our study participants included providing communication tools, additional training to CHAs to improve their proficiency in using virtual platforms and adapting educational materials to suit the diverse participant population's cultural and linguistic needs. Despite challenges such as ensuring participant engagement and retention in the virtual format and addressing technology barriers for both CHAs and participants, the study successfully adapted to the specific needs of the target population. DISCUSSION: CHAs are essential partners to assist underserved AA older adults in managing chronic diseases. Adaptability and teamwork are key to implementing health interventions especially in underserved populations.

Category: 5.0 - Community-Based Participatory Research - 5.01 Community-Based Participatory Research Addressing Minority Health and Health Disparities - RESEARCH ABSTRACT

Grant Support: Research reported was supported by the National Institute of Minority Health and Health Disparities under award numbers U54MD007598 and R25 MD007610

TRENDS OF COVID-19 VACCINATION AMONG LOUISIANA PHARMACIES FROM MAY 2021 TO MAY 2022: A PROSPECTIVE, COHORT STUDY

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Abstract

Purpose: This study aimed to explore the differences in COVID-19 vaccine uptake among the 9 different Department of Health regions of Louisiana (LDH). Methods: This is a prospective, cohort study among community pharmacies in Louisiana. Pharmacists from a total of 53 pharmacies completed surveys from Fall 2021, with follow up surveys occurring in Summer 2022. Survey domains included demographics, patient population, vaccine encouragement, concerns about COVID-19, patients' insurance coverage, and monthly vaccine administration

rates. Pharmacists recorded, on average, how many COVID-19 vaccines they (or their store) administered per day In May 2021, August 2021, October 2021, December 2021, and May 2022. Chi square and linear regression were used in the statistical analysis. All data is presented as vaccine per 100 prescriptions. This study was IRB approved. Results: There were 53 participating pharmacies in this study. Chain pharmacies gave fewer vaccines in May (4.83 vs 9.19), August (6.04 vs 8.72), October 2021 (4.26 vs 7.2), and December 2021 (7.07 vs 7.88) compared to independent. As of May 2022, pharmacies that reported serving <50% Caucasian population gave more vaccines (6.93) than those with >50% Caucasian patients (2.61). Those serving ≥10% uninsured patients saw a higher vaccination rate in December 2021 than pharmacies serving <10% (10.69 vs 7.02). Pharmacies serving >30% rural patients saw a high level of vaccine administration from May (9.11), August (13.54), and October 2021 (14.21) with a reduction from December 2021 (4.7). Following Hurricane Ida, pharmacies in LDH regions impacted by the storm gave fewer vaccines (8.69) than those not impacted (11.44). All regions saw increased trends in vaccination through December 2021 then a decrease. Conclusion: Demand for vaccinations increased as eligibility criteria expanded. Racial demographics, population density, insurance status, and pharmacy setting were key factors in the number of vaccines delivered.

Category: 5.0 - Community-Based Participatory Research - 5.01 Community-Based Participatory Research Addressing Minority Health and Health Disparities - RESEARCH ABSTRACT

Grant Support: 3U54MD007595-12S4

MEANINGFUL APPROACHES TO SUPPORT EQUITABLE COMMUNITY PARTNERSHIPS

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Abstract

PURPOSE: Meaningful approaches to support equitable community/academic partnerships demand a sharing of power (influence on what is researched and how research is conducted). These tangible versus rhetorical strategies are employed by the Community Engaged Core (CEC) of Ola HAWAII, a Research Center in Minority Institutions program at the University of Hawai‘i to support communities' active role in research. METHODS: Strategies include (1) subcontracting 40% of the CEC budget to a community-based organization (CBO) partner to facilitate training and dissemination events to avoid a cumbersome academic bureaucracy, (2) conducting assessments to identify community priorities to inform research foci, (3) supporting a community group, representative of Hawai‘i's diverse and indigenous communities, that reviews all pilot proposals to assure approaches and methodologies are relevant, respectful and culturally appropriate, (3) requiring pilot applicants to identify a community mentor to support awareness of community concerns, particularly those raised in the review stage, and (4) requiring researchers to write a lay summary of their research and present findings to communities through community-placed, community-hosted Report to the Community events. RESULTS: Twelve CEC community members participated in multiple grant reviews, training, and meetings. A CBO, Hawai‘i Public Health Institute, has partnered to facilitate CEC activities, streamline the process of moving funds to the community, and build research capacity through their statewide network. The CEC has also consulted with over 15 emerging investigators and 10 community groups. DISCUSSION/CONCLUSION: Community partners have significant, compensated roles to support Community Based Participatory Research including, developing curriculum on researcher conduct featuring examples of respectful, equitable partnerships; hosting community trainings and forums for researchers to report findings back to communities, and identifying

Category: 5.0 - Community-Based Participatory Research - 5.01 Community-Based Participatory Research Addressing Minority Health and Health Disparities - RESEARCH ABSTRACT

Grant Support: National Institute on Minority Health and Health Disparities (NIMHD) through the Research Centers in Minority Institutions (RCMI) (#2U54MD007601-36)

COVID-19 VACCINE UPTAKE AMONG MINORITY PUBLIC HOUSING RESIDENTS

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JET)

Abstract

Purpose: COVID-19 vaccine completion rates remain lower among African American and Latinx populations, especially for those residing in highly congregated spaces such as public housing residents. Decreased uptake of COVID-19 vaccinations among African Americans and Latinx public housing residents may be linked to systemic inequities and medical mistrust, potentially resulting in increased risk of infection and vaccine hesitancy. The goal of this multi-phase study was to utilize an academic-community partnered approach to address COVID-19 vaccine hesitancy among African American and Latinx public housing residents. Methods: Eight virtual bidirectional townhall forums centered on COVID-19 disease and vaccinations were hosted in English and Spanish for public housing residents in Los Angeles, California. A multidisciplinary panel of physicians, nurses, public health leaders, and community organizers facilitated all forums. Health fairs were also hosted at public housing sites to provide COVID-19 vaccines. Results: A total of 334 African American and Latinx public housing residents participated in the townhall forums and community health fairs. Over 15% received either a COVID-19 primary series or booster vaccination at the health fairs. Prior to the townhalls, 36% reported being very unlikely to receive COVID-19 vaccination compared to 10% following the townhall forums. Additionally, 74% of participants perceived the COVID-19 vaccine important to their health following the townhall forums compared to 69% at baseline. Over 70% agree that their sources of COVID-19 vaccine information are trustworthy and reliable. Discussion: Findings demonstrate the impact of a community-partnered collaboration in increasing COVID-19 vaccine uptake among public housing residents. Although these populations may express hesitancy towards COVID-19 vaccinations, our results suggest they are interested in learning about various COVID-19 vaccines and expanding community access to health services.

Category: 5.0 - Community-Based Participatory Research - 5.01 Community-Based Participatory Research Addressing Minority Health and Health Disparities - RESEARCH ABSTRACT

Grant Support: Grant Support: 1) National Institute on Minority Health and Health Disparities: U54MD007598; and 2) National Institute on Minority Health and Health Disparities: R25 MD007610

DEVELOPING LEADERS TO COMBAT COVID-19 VACCINE HESITANCY

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Abstract

PURPOSE: Public housing residents remain at risk for COVID-19 morbidity and mortality due to COVID-19 vaccine hesitancy. Community-based health leadership teams involving both healthcare professionals and community residents should be considered to improve these outcomes. Therefore, the first goal of this multi-phase study was to develop and evaluate the effectiveness of an innovative, multidisciplinary, culturally sensitive COVID-19 vaccine leadership training program. METHODS: A virtual COVID-19 vaccine leadership training program was delivered to 114 trainees. Trainees included public housing residents, and physician assistant, nursing and public health students, placed in triads for shared collaboration. Curricular focus was placed on COVID-19 education and cultural, systemic, and psychosocial factors contributing to decreased vaccination rates among under-resourced minority populations. Trainees completed pre- and post-training questionnaires to assess change in perceived COVID-19 disease and vaccine knowledge, attitudes, and skills. RESULTS: Among 114 trainees, over 95% reported increased knowledge and preparation in their role to provide COVID-19 vaccine education and coaching to African American and Latinx public housing residents. Over 80% reported having adequate knowledge of COVID-19 vaccines, compared to 55% at baseline. Prior to the training, 42% reported being somewhat prepared to provide COVID-19 education at baseline compared to 67% following training. Focus group findings with trainees suggested positive attitudes about preparation to educate and coach public housing residents. DISCUSSION: Findings demonstrate the effectiveness of an innovative training program for increasing COVID-19 vaccine knowledge and mitigating hesitancy among under-resourced populations. As COVID-19 vaccine leaders, healthcare professionals and community residents are in a unique position to influence COVID-19 vaccine uptake across multiple communities and settings.

Category: 5.0 - Community-Based Participatory Research - 5.01 Community-Based Participatory Research Addressing Minority Health and Health Disparities - RESEARCH ABSTRACT

Grant Support: GRANT SUPPORT: 1) National Institute on Minority Health and Health Disparities: U54MD007598; and 2) National Institute on Minority Health and Health Disparities: R25 MD007610

APPLICATION OF CBPR PRINCIPLES: LESSONS FROM CEASE PROGRAM

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Abstract

PURPOSE: To explore the ways CBPR (Community-Based Participatory Research) principles shape partnership processes in the CEASE Program METHODS: CBPR prioritizes trusting partnerships, as well as the principles of flexibility, shared power, and a respect for diversity. The Communities Engaged and Advocating for a Smoke-free Environment (CEASE) program is a long-standing CBPR partnership that has developed and continuously improved a peer-led community-based smoking cessation program for underserved communities for over a decade. Relationships have been cultivated with various groups that host the interventions (virtual vs. in-person). The use of CBPR principles has facilitated the creation of 1.) new partner relationships, 2.) site-specific engagement strategies, and 3.) a hybrid intervention. RESULTS: In this current phase, CEASE has engaged over 20 service providers, residences, and community-based organizations to serve as partners and/or to support recruitment efforts. Two hundred and twenty two participants have been enrolled. Engagement strategies employed include distributing print and digital media, hosting presentations, door-to-door flyering, and attending in-person events. Memorandums of Agreement established clear roles and responsibilities. Site Coordinators participated in ongoing planning and problem-solving. Partners informed the development of a hybrid intervention, which appeared to better serve groups with literacy and digital literacy challenges, as well as limited access to technology and reliable internet. DISCUSSION: Partnerships grounded in CBPR principles allow CEASE to respond to the dynamics in the community and create new relationships. The diversity of partnerships has significantly increased enrollment numbers, but it has also had implications for follow up numbers. CBPR offers a critical framework for addressing health disparities. The dissemination of study findings provides CEASE opportunities to deepen partner relationships.

Category: 5.0 - Community-Based Participatory Research - 5.01 Community-Based Participatory Research Addressing Minority Health and Health Disparities - RESEARCH ABSTRACT

Grant Support: This work was supported by the National Institute on Minority Health and Health Disparities RCMI@Morgan #5U54MD013376-8281.

MALAMA: BACKYARD AQUAPONICS TO PROMOTE HEALTHY EATING AND REDUCE CARDIOMETABOLIC RISK

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Abstract

Although Hawai‘i is portrayed as the healthiest state in the US, pervasive diet-related health disparities and challenges exist for Kānaka Maoli (Hawaiians), the indigenous people of Hawai‘i. Hawaiians have the highest mortality rates of cardiometabolic diseases, such as heart disease and diabetes, and the lowest life expectancy compared to the other major ethnic groups in Hawai‘i. Hawaiians face environmental and economic barriers to healthy eating, which can decrease cardiometabolic risks. They are overrepresented in economically disadvantaged neighborhoods with limited healthy food options, and are also more likely to face food insecurity. Because there are few culturally-grounded approaches to address these health disparities, MALAMA was developed through a community-academic partnership using principles of community-based participatory research. MALAMA is a culturally-grounded intervention that merges the technology of aquaponics with Hawaiian cultural practices as a home food production method to promote consumption and access to healthy foods. To test the efficacy of MALAMA, a wait-list randomized controlled trial design was implemented with 20 Hawaiian families (n=67) from the community of Waimānalo on the island of O‘ahu. Participants completed a 6-month curriculum composed of 9 hands-on family based workshops with each family building an aquaponics system for their home. We found significant increases in positive attitudes toward healthy eating (p=0.015) and confidence in building/maintaining an aquaponics system (p=0.004). We found significant decreases in food insecurity (p=0.010), and in HbA1c for participants age 52+ (p=0.018). Relationships within and across the families as well as the cultural protocols integrated into the

workshops were found to be essential to the intervention. To build on these findings, current research is underway to test the efficacy of MALAMA with 60 Hawaiian families on three islands. Findings will inform the implications of MALAMA as

Category: 5.0 - Community-Based Participatory Research - 5.01 Community-Based Participatory Research Addressing Minority Health and Health Disparities - RESEARCH ABSTRACT

Grant Support: 2U54MD007601-36

STOOL-BASED COLORECTAL CANCER SCREENING INTERVENTION

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Abstract

PURPOSE: African Americans experience colorectal cancer (CRC) health disparities in screening, incidence, and mortality. Community health centers (CHC) provide stool-based testing and serve as clinical sites which may be leveraged in studies testing the effectiveness of CRC screening interventions in medically underserved populations. Test Up Now Education Program (TUNE-UP) is a behavioral clinical trial, and this research reports preliminary findings. METHODS: The TUNE-UP study baseline survey includes demographic characteristics, communication with health professionals, and CRC-related questions using validated measures. A 3-month and 9-month follow-up survey collect CRC screening outcome data for study participants. Intervention participants receive a Community Health Advisor educational intervention. Chi-square tests were used to compare proportions of screening at baseline and 3-months follow-up. RESULTS: From April 2021 to February 2023, 102 participants were recruited using CHC messaging, and 79 participants completed the 3-month follow-up survey. Among participants with baseline and 3-month follow up data, there was a significant increase in reported screening discussion with a doctor from 55% to 58% ($p<0.05$). At baseline when asked, “have you ever done a stool CRC test at home,” 43% of participants responded with “yes”. At the 3-month follow-up, there was a significant increase to 66% of participants stating “yes” to having completed a stool CRC test at home ($p<0.001$), with 10% more of intervention arm participants compared to control group participants being up-to-date. In terms of knowledge of knowing how to do a stool-based test, more participants between the ages of 55-64 compared to ages 45-54, and more men than women, reported being more knowledgeable (p’s < 0.05). CONCLUSION: Given lack of provider discussions on the screening tests, this behavioral clinical trial aims to improve accessible stool-based screening in this CHC patient population.

Category: 5.0 - Community-Based Participatory Research - 5.01 Community-Based Participatory Research Addressing Minority Health and Health Disparities - RESEARCH ABSTRACT

Grant Support: Grant support from the National Institute on Minority Health and Health Disparities of the National Institutes of Health under Award Number U54 MD007582.

LEVERAGING SEED FUNDING AND INFRASTRUCTURE IN CBPR

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Abstract

Purpose: Community-campus collaborations require time and nurturing, and seed funding is one way to support this development. Over three years, the Morgan CARES program has established a small community awards program that provides $2,000 for new partnerships. Expected outcomes included trust, equity, publications, presentations, and new initiatives to address mutual issues. Awards were reviewed by a diverse community-academic steering committee, with technical support and training provided to achieve success. The program's success and challenges were evaluated. Methods: Community leaders, faculty, staff, and students from our University are linked based on complementary skills, and co-develop applications. Once an award is received, supportive services are provided throughout the project to set the partnerships up for successfully securing subsequent funding to grow their efforts. Partners submit partnership evaluations and project reports both at the

mid and final stages of the project. Additional support is offered based on the feedback collected. Results: To date, 23 partnerships have been funded. 13 focus on health education and promotion, 7 have conducted feasibility studies or needs assessments, and 3 have conducted evaluations of existing programs. Most partners reported equal contributions, that they could rely on each other, and intend to continue their collaborations long-term. A learning network and topical think-tank were developed to enhance productivity and overall impact. Discussion: This initiative provides a pathway for individuals to connect and innovate, showing that a strong organizational infrastructure is needed to mitigate challenges. We have begun to offer larger subsequent funding for successful partnership to support the continuation of their work.

Category: 5.0 - Community-Based Participatory Research - 5.01 Community-Based Participatory Research Addressing Minority Health and Health Disparities - RESEARCH ABSTRACT

Grant Support: National Institutes of Health through the cooperative agreement NIMHD U54MD013376.

EXPLORING A FRAMEWORK FOR EVALUATING CBPR PARTNERSHIPS

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Morgan State University, Center for Urban Health Disparities Research and Innovation

Abstract

Purpose: Community-campus partnerships are an effective approach to reducing health disparities in urban communities. By providing a physical meeting space, organizational infrastructure, and supportive programming, CBPR projects and initiatives can develop and thrive. We describe Morgan CARES, a collaborative research center that utilizes a cyclical model to support long-term CBPR partnerships. Methods: Established in 2019, the Morgan CARES center supports community-campus partnerships and innovative projects by providing a range of services based on the CARES model. Beginning with the connection stage, partners receive networking and matchmaking opportunities to connect with complementary collaborators. The innovation stage offers training, technical assistance, and peer-mentoring for co-developed proposals. Funding is provided to implement collaborative actions and disseminate findings, with evaluations conducted at various stages to track progress and partnership experiences. The center aims to implement CBPR projects and broadly share results. Results: Thus far, over 340 members have joined Morgan CARES, and twenty three projects have been funded. Overall, the Center has provided over 226 training, linkage, technical assistance, and consultation sessions to 1,959 individuals. Additionally, partners have reported positive partnership experiences and several projects have continued with subsequent funding. Discussion: Through the implementation of a seed funding program, along with support to increase capacity for projects and partnerships, individuals are able to continue to re-enter the cyclical stages. Thus, we provide a pathway for projects and partnerships to be sustained, leaving the opportunity to eliminate health disparities.

Category: 5.0 - Community-Based Participatory Research - 5.01 Community-Based Participatory Research Addressing Minority Health and Health Disparities - RESEARCH ABSTRACT

Grant Support: National Institutes of Health through the cooperative agreement NIMHD U54MD013376.

POST PANDEMIC FOOD SECURITY IN RURAL NORTH CAROLINA

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WF PILKINGTON; IA Doherty; SA Robinson; RJ Gerald; TD Locklear; CO Alberico; LC Taylor
North Carolina Central University

Abstract

PURPOSE: Addressing food security in rural areas is essential to ensure that all individuals have access to nutritious food. This study's objective is to describe the scope and depth of food security in two economically distressed rural counties in North Carolina during this post-pandemic period. The hypothesis of this research is that poor access to healthy food sources, coupled with limited economic opportunities, can lead to inadequate nutrition and hunger, which can have long-term implications for the health and wellbeing of rural communities. METHODS: This study assessed food security during food bank pop-up events where participants received a package of healthy fruits and vegetables and to measure food security during pop-up food bank events. During food distribution at pop-up events, a food security survey was administered to event participants via Qualtrics tablets or individual mobile phones. The survey included 13 questions and consent to

participate. RESULTS/EXPECTED RESULTS: From the first 2 pop-up events, we collected 98 surveys, composed predominately of racialized respondents (95%), women (83%), with a median age 50 and 45% reported < $40,000 annual income. Among the 44% who had children, most (65%) received free lunches. Not having enough food during the previous 7 days was reported by 26% of participants. The survey asked if respondents could afford to buy fresh fruit (68%), meats (72%), and dairy products (73%). More than (55%) could afford all three food types, 29% could afford 1 or 2 of these foods, and 16% reported they could not afford any of the foods. DISCUSSION/CONCLUSION: Preliminary results from this survey suggest important implications for policy makers and practitioners, as well as for individuals and communities. Food security appears to have been aggravated by the pandemic and more research is needed to determine the extent of its effects on rural historically marginalized populations.

Category: 5.0 - Community-Based Participatory Research - 5.01 Community-Based Participatory Research Addressing Minority Health and Health Disparities - RESEARCH ABSTRACT

Grant Support: National Institutes of Health/Research Centers in Minority Institutions Program and North Carolina Policy Collaboratory

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USING TRA TO EXAMIN AFRICAN AMERICAN PARTICIPATION IN CLINICAL TRIALS

Dr. Joe Ricks
Xavier University of Louisiana
JM Ricks
Xavier University of Louisiana

Abstract

PURPOSE Distrust in clinical research is the most commonly cited reason for lower participation of African Americans (AA) in clinical trials, so not only is it important to address individual perceptions and beliefs regarding trails, the community distrust must also be addressed. METHOD This study used Persuasive Communication Theory (PCT) and Theory of Reasoned Action (TRA) to examine the effectiveness of marketing messaging on AA's intent to participate in clinical trials. TRA suggests that behavioral intentions are driven by attitudes and subjective norms. The model fit is examined using structural equation modeling. Using PCT marketing stimuli was designed for use in an experiment consisting of 2 levels of message: Benefits of clinical trial research or Remedial - addressing trust issues; and three levels of source: an Education, Community, or Healthcare based organization. Using a national representative sample that identified as AA, the experiment examines the effects of source and message on AA cognitive beliefs/feelings about clinical trials or attitudes; community distrust and motivation not to comply or subjective norms, and willingness to participate or intentions. RESULTS Study results indicate that TRA fit the sample data; 5 of the 6 paths were positive and significant. The one path that was not significant, motivation to comply to subjective norms, was moderated by the experimental stimuli in the remedial message condition. The community and science/healthcare based sources had greater effects. DISCUSSION The results support TRA as a predictive model and therefore highlights the importance of addressing both the individual attitudes of (AA)s and the subjective norms of the community. Addressing subjective norms require a mass marketing communication effort to supplement community outreach. This study suggests that a remedial message sponsored by a community or healthcare based organization would be most effective.

Category: 5.0 - Community-Based Participatory Research - 5.01 Community-Based Participatory Research Addressing Minority Health and Health Disparities - RESEARCH ABSTRACT

Grant Support: Xavier University's RCMI Grant. NIH Grant Number #U54MD007595 from the National Institute on Minority Health and Health Disparities and the Louisiana Cancer Research Center

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PHOTOVOICE ON CERVICAL CANCER SCREENING, CARE, BARRIERS, AND SOCIAL WORK IMPLICATIONS AMONG HISPANIC WOMEN IN EL PASO, TX

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University of Texas at El Paso
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UTEP Department of Social Work

Abstract

Cervical cancer continues to be the fourth most common type of female cancer and is primarily caused by HPV, a sexually transmitted virus that can be prevented and detected early with vaccination and adequate screening. However, the United States still suffers from disparities within its own populations. HPV detection and vaccination are especially relevant and important for Hispanic women living in the U.S.-Mexico border region because this population tends to experience much higher cervical cancer incidence and mortality rates than white women. The experiences of Hispanic women who have actually had cervical cancer have rarely been studied. This study used the Photovoice methodology, an evidence-based practice utilizing the Participatory Action Research (PAR) method, to gather personal narratives from ten Hispanic women in the El Paso, Texas area who have lived experience with cervical cancer and to advocate for political action on their behalf. Participants took photos of their daily lives and discussed their life, health, and social conditions in order to develop a call to action for community leaders and decision makers. They identified several themes that permeated the discussions: 1) Education about and access to cancer prevention, vaccination, and detection, 2) Strength, hope, and resilience to fight in the face of cancer, and 3) Cultural, structural, and systemic barriers including low income, migrant status, lack of health insurance, and prescriptive gender stereotypes. Sessions were concluded by forming a call to action with policy and practice recommendations and other implications for social work including increased education and awareness; greater free or low-cost access to screening, vaccination, and treatment; and greater cultural competence in terms of translation/bilingual service provision and practitioner empathy and sensitivity.

Category: 5.0 - Community-Based Participatory Research - 5.01 Community-Based Participatory Research Addressing Minority Health and Health Disparities - RESEARCH ABSTRACT

Grant Support: Healthy Americas Foundation; Cuídate El Paso

PERCEPTIONS OF TRUSTWORTHINESS OF MEDICAL RESEARCHERS

Dr. Carla D Williams
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Howard University (SM, CC, KP PLCN, EB, JO, CDW)

Abstract

PURPOSE The Community Conversations About COVID-19 study engaged communities and researchers in dialogues about research to promote informed decision-making. As the COVID-19 pandemic evolved, the dialogues, known as Community Wellness Roundtables (CWRs), provided up-to-date information about COVID-19. In later phases of the pandemic, CWRs continued to evolve to address broader health and wellness topics. The current analysis describes participant perceptions of the trustworthiness of medical researchers on multiple dimensions related to factors such as honesty and integrity. METHODS: This cross-sectional study used convenience sampling to recruit participants using email, social media, and in-person outreach. Participants completed a self-report survey including common data elements from the Rapid Acceleration of Diagnostics for Underserved Populations. A measure of trustworthiness of medical researchers was administered to assess factors such as whether participants believed researchers would use intentional harmful deception. Participants' knowledge about research safeguards such as informed consent, research approaches such as randomization, and the relationship between study sample size and confidence in study results was also measured. RESULTS / EXPECTED RESULTS: Among 199 participants responding to this survey, 54.8% had confidence that researchers would not intentionally lie to convince people to participate in a study. Over half (51.3%) believed that researchers were honest about the treatment options other than participating in a study. Most participants (79.4%) were aware that informed consent should be completed before enrolling in a research study. In terms of knowledge about research methods, 62.8% believed that the size of the study sample mattered and 58.3% believed that replicating research results was important. DISCUSSION / CONCLUSION: Overall, there was a moderate level of trust in researchers, and participants had a reasonable fund of knowledge about

Category: 5.0 - Community-Based Participatory Research - 5.01 Community-Based Participatory Research Addressing Minority Health and Health Disparities - RESEARCH ABSTRACT

Grant Support: 2U54MD007597-31 Sub-Project ID: 9128

RESLIENCE: THE UNTOLD STORY OF COVID-19 IN AN ETHNICALLY DIVERSE SAMPLE

Dr. Carla Williams
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Howard University (KP, SM, PLCN, EB, JO, CDW)

Abstract

PURPOSE: The Community Conversations About COVID-19 study engaged communities and researchers in dialogues about research to promote informed decision-making. As the COVID-19 pandemic evolved, the dialogues, known as Community Wellness Roundtables (CWRs), provided up-to-date information about COVID-19. In later phases of the pandemic, CWRs continued to evolve to address broader health and wellness topics. The current analysis describes the self-reported impacts of COVID-19 on interpersonal interactions, healthcare access, and health and wellness behaviors. METHODS: This cross-sectional study used convenience sampling to recruit participants using email, social media, and in-person outreach. Participants completed a self-report survey including common data elements (CDEs) from the Rapid Acceleration of Diagnostics for Underserved Populations. Among the CDEs is a measure of the impact of COVID-19 on multiple domains of the lived experience. We examined participant responses (N = 94) in association with a computed social vulnerability index (SVI) that included income, employment, race, ethnicity, education, age, disability, insurance, and language barriers (i.e., English language proficiency). RESULTS / EXPECTED RESULTS: While health concerns were the greatest source of stress reported by participants, only about 23% reported missing medical care appointments due to concerns of COVID-19 exposure. About 12% reported that their job increased their risk of getting COVID-19. About 46% reported reduced contact with family living outside of the home, while nearly 62% reported reduced contact with friends. However, talking with family and friends was the most frequent means of coping with COVID-related stress. Few participants reported maladaptive coping strategies such as use of tobacco, alcohol, or marijuana. The SVI was not frequently associated with indicators of resilience. DISCUSSION / CONCLUSION: Data reveal that this study population had an appreciable level of resilience

Category: 5.0 - Community-Based Participatory Research - 5.01 Community-Based Participatory Research Addressing Minority Health and Health Disparities - RESEARCH ABSTRACT

Grant Support: 2U54MD007597-31 Sub-Project ID: 9128

SELF-REPORTED EXPERIENCES OF RACISM AMONG AN ETHNICALLY DIVERSE POPULATION

Dr. Carla D Williams
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K PARKER; S Mahalingam; PL Carter-Nolan; E Barrientos; J Otado; CD Williams
Howard University (KP, SM, PLCN, EB, JO, CDW)

Abstract

PURPOSE The Community Conversations About COVID-19 study engaged communities and researchers in dialogues about research to promote informed decision-making. As the COVID-19 pandemic evolved, the dialogues, known as Community Wellness Roundtables (CWRs), provided up-to-date information about COVID-19. In later phases of the pandemic, CWRs continued to evolve to address broader health and wellness topics. The current analysis describes the experiences with racism reported by the study participants. METHODS: This cross-sectional study used convenience sampling to recruit participants using email, social media, and in-person outreach. Participants completed a self-report survey including common data elements from the Rapid Acceleration of Diagnostics for Underserved Populations. Other measures include experiences with racism, trust in medical research, and control within the work environment. Descriptive statistics are used to describe participant demographics and self-reported experiences with racism. RESULTS / EXPECTED RESULTS: Nearly 80% of the study population identified as either Black, African, or African American. Approximately one-third of participants reported having multiple experiences with racism at least a few times per year. The most reported experience was a perception that “People act as if they are afraid of you.” Among study participants, 21.3% reported experiencing this form of racism almost every day. Additional analysis will explore the potential associations between perceived racism and health indicators. DISCUSSION / CONCLUSION: Data reveal that most experiences with racism are infrequent but memorable enough to be reported to occur a few times per year. However, the interpersonal interactions related to being perceived as a threat were experienced with much greater frequency. The impact of this experience may negatively impact social interactions and possibly have downstream impacts on health within this population.

Category: 5.0 - Community-Based Participatory Research - 5.01 Community-Based Participatory Research Addressing Minority Health and Health Disparities - RESEARCH ABSTRACT

Grant Support: GRANT SUPPORT: 2U54MD007597-31 Sub-Project ID: 9128

SELF-REPORTED EXPERIENCES OF RACISM AMONG AN ETHNICALLY DIVERSE POPULATION

Dr. Carla D Williams
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K PARKER; S Mahalingam; PL Carter-Nolan; E Barrientos; J Otado; CD Williams
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Abstract

PURPOSE The Community Conversations About COVID-19 engaged communities and researchers in dialogues about research to promote informed decision-making. As the COVID-19 pandemic evolved, the dialogues, known as Community Wellness Roundtables (CWRs), provided up-to-date information about COVID-19. In later phases of the pandemic, CWRs continued to evolve to address broader health and wellness topics. The current analysis describes the experiences with racism reported by the study participants. METHODS: This cross-sectional study used convenience sampling to recruit participants using email, social media, and in-person outreach. Participants completed a self-report survey including common data elements from the Rapid Acceleration of Diagnostics for Underserved Populations. Other measures include experiences with racism, trust in medical research, and control within the work environment. Descriptive statistics are used to describe participant demographics and self-reported experiences with racism. RESULTS / EXPECTED RESULTS: Nearly 80% of the study population identified as either Black, African, or African American. Approximately one-third of participants reported having multiple experiences with racism at least a few times per year. The most reported experience was a perception that “People act as if they are afraid of you.” Among study participants, 21.3% reported experiencing this form of racism almost every day. Additional analysis will explore the potential associations between perceived racism and health indicators. DISCUSSION / CONCLUSION: Data reveal that most experiences with racism are infrequent but memorable enough to be reported to occur a few times per year. However, the interpersonal interactions related to being perceived as a threat were experienced with much greater frequency. The impact of this experience may negatively impact social interactions and possibly have downstream impacts on health within this population.

Category: 5.0 - Community-Based Participatory Research - 2.04 - Social Determinants of Health5.01 Community-Based Participatory Research Addressing Minority Health and Health Disparities - RESEARCH ABSTRACT

Grant Support: 2U54MD007597-31 Sub-Project ID: 9128

MHEALTH FOR ELDERLY MEDICATION ADHERENCE, STAKEHOLDER VIEWS

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Charles R. Drew University of Medicine and Sciences (HY, MB, LJ); University of California, Los Angeles (HY, MB); University of Hawai'i at Hilo (DAT); Queens Medical Center (MV, TBS)

Abstract

PURPOSE: This study aimed to explore the acceptability and usability of mobile health technology (mHealth) to improve medication adherence for elderly hypertensive African American, Native Hawaiian and Pacific Islander patients. METHODS: In-depth interviews were conducted with 20 gatekeeper-stakeholders. Two independent coders manually organized and coded the deidentified transcripts. RESULTS: A successful mHealth intervention should include three key elements. First, participants need to be educated on the importance of adherence to antihypertensive medications. Second, messaging should be short, simple, personalized, and sent from someone the participant trusts and has a connection with. Third, participants should have access to ongoing technical support through mobile phones. Both African American and Native Hawaiian and Pacific Islander gatekeeper-stakeholders expressed similar views on these three elements. However, there were some differences between the two groups. African American gatekeeper-stakeholders emphasized the importance of involving the church in the intervention and suggested group workshops as a starting point. In contrast, Native Hawaiian and Pacific Islander gatekeeper-stakeholders preferred one-to-one teaching with a healthcare provider. Additionally, African American gatekeeper-stakeholders preferred messages to come from someone outside of the healthcare system, while Native Hawaiian and Pacific Islander gatekeeper-stakeholders preferred messages from healthcare providers. DISCUSSION / CONCLUSION: The design of a mHealth intervention to improve adherence to antihypertensives among elderly African American and Native Hawaiian and Pacific Islander patients could be similar. However, differences in initiation and messaging may exist between the two groups. These findings may help inform the development of mHealth interventions for hypertension management among these populations.

Category: 5.0 - Community-Based Participatory Research - 5.01 Community-Based Participatory Research Addressing Minority Health and Health Disparities - RESEARCH ABSTRACT

Grant Support: 1) (AXIS) grant NIH-NIMHD #U54 MD007598 (Funded this pilot project); 2) (CRECD) grant NIH-NIMHD #5MD007610 (Supported HY), 3) (RCMI-RTRN) grant #9U54MD008149-06 (Supported DAT); 4) NIH-NIMHD #U54MD007584 (Supported MV, TBS).

6.0 - DATA SCIENCE / BIG DATA

MECHANISM OF REGULATION OF THE CHRDL1 GENE BY TWIST2 AND ADD1/SREBP1C

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University of Puerto Rico Medical Sciences Campus
CL CADILLA, JJ Casasnovas and Y Rodriguez
University of Puerto Rico Medical Sciences, School of Medicine, Department of Biochemistry (CLC, JJC, YR)

Abstract

PURPOSE: Setleis syndrome (SS) is a rare focal facial dermal dysplasia caused by recessive mutations in the basic helix-loop-helix (bHLH) transcription factor, TWIST2. Puerto Rican (PR) SS patients have a nonsense mutation (Q119X) which codes for a truncated protein. In order to understand the gene dysregulation effects of TWIST2 mutations, we used expression microarrays and found that the chordin-like 1 (CHRDL1) gene is up-regulated in PR SS patients skin fibroblasts. The CHRDL1 gene codes for a bone morphogenetic protein (BMP) antagonist. Loss-of-function mutations in the CHRDL1 gene cause X-linked megalocornea. METHODS: Putative TWIST binding sites (E-boxes) were found upstream from the transcription start site (TSS) of the CHRDL1 gene by bioinformatic analysis and examined by Electrophoretic mobility shift (EMSA) and reporter gene assays. RESULTS: EMSAs showed specific binding of TWIST1 and TWIST2 homodimers, as well as heterodimers with the ubiquitous bHLH protein E12, to the region containing the more distal E-boxes. The Q1191X mutant protein was only able to bind to these sites as a heterodimer with E12. An adjoining E-box was bound by ADD1/SREBP1c, a bHLH protein known to be repressed by TWIST2. EMSA analysis suggest that TWIST2 and ADD1 could compete for binding. Luciferase (luc) reporter assay revealed that the CHRDL1 gene upstream region drives its expression and ADD1/SREBP1c increased it 2.6X over basal levels. TWIST2, but not the Q119X mutant, blocked activation by ADD1/SREBP1c, but overexpression of Q119X increased the luc gene expression. In addition, EMSA competition assays showed that TWIST2, but not TWIST1, competes with ADD1/SREBP1c for DNA binding to the same site. CONCLUSIONS: The dysregulation of CHRDL1 in SS patients could be due to formation of an inactive complex between the TWIST2 Q119X mutant and ADD1/SREBP1c, hence preventing repressor binding and allowing the binding of other transcription factors to activate CHRDL1 gene expression.

Category: 6.0 - Data Science / Big Data - 6.05 - Genomics - RESEARCH ABSTRACT

Grant Support: NIH grants from NIMHD (U54MD007600) and NIGMS (SC1GM139706, P20GM10347 and R25GM061838) supported this work.

MULTIOMICS APPROACHES TO ELUCIDATE THE HEALTH DISPARITIES IN HUMAN DISEASES

Dr. Kumaraswamy Naidu Chitrala
University of Houston
Kumaraswamy Naidu Chitrala
Department of Engineering Technology, University og Houston

Abstract

Health disparities among the populations have long been challenging and still, it is an unresolved public health issue. Several factors such as race/ethnicity and socio-economic status were found to influence this health disparity with African Americans experiencing premature chronic health outcomes and longevity compared to the white population. Among the human diseases/disorders where these disparities play a key role include cancer, metabolic syndrome, multiple sclerosis, and post-traumatic stress disorder. Still, studies are in need to address the gaps in knowledge for racial and ethnic-specific differences in these diseases and studies still lack to include a large cohort of non-whites and/or Hispanic participants. Multi-omics approaches on the other hand are known to show an increasingly crucial role in decoding a wealth of

genomic, proteomic, and metabolomic data to unravel the complex interplay of social, economic, biological, and environmental factors that contribute to disparities among diseases. My laboratory focuses on elucidating the genetic and epigenetic mechanisms in these human disorders using multi-omics approaches. In the current talk, I will discuss how we can unravel the genetic and epigenetic mechanisms leading to health disparities among the population with lower socioeconomic status in these human diseases using the multi-omics approaches.

Category: 6.0 - Data Science / Big Data - 6.05 - Genomics - RESEARCH ABSTRACT

Grant Support: Research reported in this publication was supported by the National Institute on Minority Health and Health Disparities (NIMHD) of the National Institutes of Health (NIH) to the University of Houston under Award Number U54MD015946. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health

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MUTATION PATTERNS OF SARS-COV-2 DURING VACCINATION: IMPLICATIONS FOR FUTURE VACCINES AND THERAPEUTICS

Prof. Youping Deng
University of Hawaii at Manoa
STokhanbigli; K Rahimian; M Mahmanzar; A Mikaeili Namini; S Ahangarzadeh; R Mahmanzar; Y Wang; B G. Oliver; Y Deng;
University of Technology Sydney, Australia (ST, BGO), University of Tehran (KR), John A. Burns School of Medicine, University of Hawaii at Manoa (MM, YD), Kharazmi University (AMN), Isfahan University of Medical Sciences (SA), Islamic Azad University (RM), Zhengzhou University (WY))

Abstract

PURPOSE SARS-CoV-2 has undergone various mutations, leading to the emergence of different variants of the virus. The vaccination programs implemented worldwide aim to prevent the spread of the virus and reduce its potential to mutate. However, the emergence of vaccine resistance variants is imminent, making it indispensable to unravel the occurred mutations during vaccinations. In this study, we aimed to investigate the mutation patterns of SARS-CoV-2 during vaccinations in different countries, categorized by the percentage of vaccinated populations. METHODS: We alinged 10.5 million Amino Acid samples retrieved GISAID from recipients of two vaccine doses and grouped them into three categories based on the percentage of vaccinated population. We applied criteria such as the administration of similar vaccines and comparable NGS data to ensure the reliability of our findings. The spike mutation pattern was analyzed at four different time points, including before vaccination, initial, middle, and the end of vaccination, using the original COVID-19 virus as the reference genome. RESULTS: Our results showed that common mutations such as D614G, and P681 occurred in all groups at different time points, while other mutations were specific to certain groups. Interestingly, we observed a decrease in the number of mutations with the progression of vaccination, especially in the group with 70-100% of the vaccinated population. This phenomenon indicates the potential of vaccination in reducing the emergence of vaccine resistance variants. CONCLUSION: Our study suggest that conserved parts of the spike protein could be targeted in the development of future vaccines and drugs. This approach ensures the effectiveness of immunizations against potential future variants of SARS-CoV-2. These conserved parts of the spike protein could also serve as therapeutic targets in the next generation of vaccines and drugs.

Category: 6.0 - Data Science / Big Data - 6.02 - Biomedical Informatics - RESEARCH ABSTRACT

Grant Support: This work was partially supported by the NIH grants and 2U54CA143727, 5P30GM114737, 5P20GM103466, 5U54MD007601, 5P30CA071789.

ENHANCING BIOINFORMATICS AND BIOSTATISTICS CAPACITY AT FLORIDA A&M UNIVERSITY

Prof. Gebre-egziabher Kiros
Florida A & M University
GE Kiros; EI Velazquez-Villarreal; J-H Lee; J Brant
Florida A & M University (GEK); University of Southern California (EIVV); University of Florida (JHL, JB);

Abstract

Practical training and support in bioinformatics, statistics, and other research tools are essential for researchers to enhance their productivity and advance their research. The Bioinformatics, Statistical, and Methodological Core (BSMC) of the CaRE2 Health Equity Center aims to provide researchers with the necessary quantitative support, including bioinformatics, statistical and methodological support, and educational opportunities. The CaRE2 Center is a triad partnership among Florida Agricultural and Mechanical University (FAMU), the University of

Florida (UF) Cancer Center, and the University of Southern California (USC) Cancer Center. An NIH/NCI U54 grant supports the center. Its main long-term goals are to reduce cancer health disparities and promote the training of Black and Latinx biomedical scientists in conducting health disparity research. BSMC is an integral part of CaRE2 that regularly interacts with all project investigators and cores. The BSMC has delivered several methodologies, including novel or state-of-the-art analyses for bulk and single-cell DNA, RNA, and epigenomics sequencing data. Established analytical workflows that contributed to investigators' study design and execution provided continuing education on current and changing research and promoted collaboration among CaRE2 investigators in cancer health disparity research. In the past four years, BSMC members supported 18 CaRE2 investigators with 25 abstracts/presentations, 12 manuscripts, and 8 grant applications. The monthly webinars and workshops have attracted participants from our partnering institutions and beyond. The total participants of the webinars and workshops over 4 years include CaRE2 investigators, other researchers, Early-Stage Investigators (ESIs), Postdocs, community members, and graduate and undergraduate students. Future plans for the BSMC include expanding bioinformatics methods for single-cell DNA, RNA, and epigenomics data analysis and Artificial Intelligence based machine/de

Category: 6.0 - Data Science / Big Data - 6.02 - Biomedical Informatics - RESEARCH ABSTRACT

Grant Support: U54MD007582; U54CA233396; U54CA233444; U54CA233465

SINGLE NUCLEOTIDE VARIANT DATA FOR ACUTE MYELOID LEUKEMIA

Dr. Ming-ying Leung
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MY LEUNG; AM Bataycan
The University of Texas at El Paso (MYL, AMB)

Abstract

PURPOSE The goal of this work is to organize a dataset of single nucleotide variants (SNVs) found in patients with acute myeloid leukemia (AML) for downstream bioinformatics analysis. As environmental or hereditary genetic mutations are considered leading causes of cancer, understanding SNVs at the DNA level can help provide insights for potential gene therapies. Furthermore, Hispanic patients with AML are diagnosed at younger average age and have worse outcomes compared with non-Hispanic patients. Identifying SNVs associated with the disease may allow for better design of intervention strategies for reducing the disparity. METHODS SNV data files for patients with AML are downloaded from the Genomic Data Commons (GDC) and transformed into more readable csv files, providing genomic information for each SNV in each patient's tumor and normal samples. We used the tools in the OncoMiner pipeline to help compile the patients' information into a single dataset, and obtained an overall statistical comparison of SNV counts between tumor and normal samples. RESULTS / EXPECTED RESULTS Based on the downloaded SNV data from 149 distinct patients, we compiled a dataset listing the genomic locations and nucleotide change type of 136071 different SNVs (136051 in tumor, 6769 in normal, 6749 in both), along with a binary matrix recording the occurrence or non-occurrence of each SNV in each patient. Separate counts for the 12 different types of SNVs in protein-coding gene transcripts revealed that the levels of mutation from C and G nucleotides is more than twice of those from A and T. DISCUSSION / CONCLUSION This SNV dataset will provide necessary information for downstream analysis to compare the mutational profiles between tumor and normal samples, evaluate the functional effects of individual variants, and conduct pathway enrichment and protein-protein interaction analyses to select likely AML-associated genes for further investigation.

Category: 6.0 - Data Science / Big Data - 6.05 - Genomics - RESEARCH ABSTRACT

Grant Support: This work is supported in part by grant 5U54MD007592 from the National Institute on Minority Health and Health Disparities, a component of the National Institutes of Health.

OMICS ANALYSES ASSOCIATED WITH COVID-19 DISEASE SEVERITY

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Abstract

PURPOSE. Severe Acute Respiratory Virus (SARS-CoV-2) causes coronavirus 2019 (COVID-19) ranging from asymptomatic to severe disease. We hypothesized that host factors are associated with COVID-19 disease severity in Puerto Rican Hispanics. METHODS. After IRB approval, 121 men and women aged 21-80 years-old were recruited. Plasma and peripheral blood cells (PBMC) were collected from COVID-19 positive unvaccinated (n=39) and vaccinated (n=11) patients, including negative unvaccinated (n=56). Unvaccinated COVID-19 patients were stratified based on symptomatology as follows: mild (n=18), moderate (n=13), and severe (n=8). DNA was isolated from PBMC of participants and Global Diversity Arrays were used to identify SNPs with a minor allele frequency (MAF). Quantitative proteomics was performed in plasma using Tandem Mass Tag (TMT) labeling, Proteome Discoverer, and Limma Statistics. Genomics and Proteomics results were analyzed by IPA. Cytokines were quantified in plasma using a human cytokine array. RESULTS. Multiomics analyses revealed that the common pathways associated with COVID-19 severity were: Synaptogenesis, Epithelial Adherens Junction, and Actin Cytoskeleton Signaling. Moreover, Synaptogenesis was predicted to be inhibited in severe patients in proteomics analyses. Common implicated genes found in multiomics analyses were: Neural cell adhesion molecule L1-like protein, Neural cell adhesion molecule 2, Gelsolin, Mast/stem cell growth factor receptor Kit, L-selectin, Vinculin, Cadherin-13, and Plexin-domain containing protein 2. Cadherin-13 participates in Synaptogenesis Signaling and represents a potential candidate gene for predicting disease severity in our Puerto Rican Population. Levels of IL-1Rα, IP-10, and TNFα were increased in COVID-19, whereas PDGF-BB levels were decreased in COVID-19 patients. CONCLUSION. This study uncovers potential host predictors of COVID-19 severity and mechanisms associated with neurological consequences in Hispanics.

Category: 6.0 - Data Science / Big Data - 6.07 - Proteomics - RESEARCH ABSTRACT

Grant Support: This research was supported in part by grants from the National Institutes of Health: U54MD007600, P20GM103475, U54GM133807, UPR COVID19, “D-SPAN”- F99NS113455, K00NS11345, K22NS118975, R01NS099036, and the UPR-Comprehensive Cancer Center.

SINGLE CELL RNA-SEQUENCING DATA ANALYSIS IN PULMONARY PASC

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University of Hawaii at Manoa
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Abstract

PURPOSE Although our understanding of immunopathology in the risk and severity of COVID-19 disease is evolving, a detail of immune response in long-term consequences of COVID-19 infection remains unclear. Recently, few studies have detailed the immune and cytokine profiles associated with PASC. However, dysregulation of immune system driving pulmonary PASC (PPASC) is still largely unknown. METHODS To characterize the immunological features of PPASC, we performed droplet-based scRNA-sequencing using 10X genomics to study the transcriptomic profiles of peripheral blood mononuclear cells (PBMCs) from participants naïve to SARS-CoV-2 (NP, n=2) and infected with SARS-CoV-2 with chronic pulmonary symptoms (PPASC, n=2). RESULTS Analysis of more than 37,000 PBMCs by integrating our dataset with previously reported control datasets generated cell distribution and identified 11 immune cell types based on canonical gene expression. The proportion of myeloid-lineage cells (CD14+ monocyte, CD16+ monocyte, and dendritic cells) were increased in PPASC compared with those of NP. Specifically, PPASC displayed up-regulation of VEGFA and transcription factors, such as ATF2, VEGFA. ELK, and SMAD in myeloid-lineage cells. Also, TGF-β and WNT signaling pathways were up-regulated in these cell population. Cell-cell interaction analysis identified that myeloid-lineage cells in PPASC participated in regulation of fibrosis and immune response, such as VEGFA (increased) and MIF (decreased) interactions. CONCLUSION Together, this study provides high-resolution insights into immune landscape in PPASC. Our results emphasize differences in myeloid lineage-mediated fibrosis and immunity between PPASC and NP, suggesting they could act as potential pathological drivers of PPASC.

Category: 6.0 - Data Science / Big Data - 6.05 - Genomics - RESEARCH ABSTRACT

Grant Support: This work was supported by NIH/NIMHD (2U54MD007601), Myra W. and Jean Kent Angus Foundation, and the Molecular and Cellular Immunology Core through the funding of the Centers of Biomedical Research Excellence (COBRE) program (P30GM114737).

ANALYSIS OF INTRINSICALLY DISORDERED PROTEOMES IN CANCER

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Abstract

PURPOSE. Intrinsically disordered proteins (IDPs) show a lack of stable native structure. This unique molecular feature differs IDPs from all other cellular proteins. Thus, IDPs may represent a unique subset of the proteome termed the "unfoldome". Due to the known specific features at the primary amino acid sequence level, IDPs can be predicted when the sequence is elucidated. Human IDPs are known to facilitate regulatory functions and signal transduction and often are associated with various diseases. Therefore, we hypothesize that IDP characterization in tumor cells would benefit cancer research. METHODS. IDP proteomics analysis was done using MudPIT (Multidimensional Protein Identification Technology) to characterize differentially expressed IDPs in human normal and breast cancer cell lines. First, fully folded proteins were removed from cell lysates by precipitation with 1.5% trichloroacetic acid; next, the IDP fraction was sedimented with 20% trichloroacetic acid. Proteomics analysis of IDPs involves a 10-step MudPIT using biphasic nano-chromatography and an Orbitrap LTQ XL mass spectrometer. RESULTS. A total of 2,271 IDP groups have been identified in both the normal and breast cancer unfoldomes. From this number, 148 IDPs were significantly more abundant in cancer cells (> 2 fold; $p < 0.05$). Bioinformatics analysis allowed annotation of 140 proteins (DAVID Bioinformatics Resources 6.8, NIAID/NIH) with in silico analysis confirming the characteristic disordered features. 65% (91 of 140) IDPs were related to various diseases, and 20% (28 of 140) IDPs were related to cancer (GAD_DISEASE database). Most differentially expressed IDPs contained long disordered regions (> 30% of the sequence). These IDPs were classified using major Gene Ontology categories with subsequent pathway analysis using an interacting genes database (DAVID). CONCLUSION. These results have provided an initial conformation of the role of IDPs in the molecular mechanisms of breast cancer.

Category: 6.0 - Data Science / Big Data - 6.07 - Proteomics - RESEARCH ABSTRACT

Grant Support: The Meharry RCMI program U54MD007586 (NIH/NIMHD)

FACTORS PREDICTING THE MORTALITY OF HEART DISEASE PATIENTS

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Abstract

PURPOSE: The purpose of this study is to identify the most significant factors affecting mortality of patients with heart disease. METHODS: A binary Hyperbolastic regression of type II was used to predict the death status of patients using data from the University of California Irvine Machine Learning Repository. In addition, the results were validated by applying the multilayer perceptron method in machine learning to the data. This dataset contains the medical records of 299 patients who had heart failure. The specific target variable of interest was death. Eleven predictor variables included in the model were: 1) age, 2) anemia, 3) hypertension, 4) creatinine phosphokinase, 5) diabetes, 6) platelets per 100K, 7) serum creatinine, 8) serum sodium, 9) sex, 10) smoking and 11) ejection fraction. RESULTS / EXPECTED RESULTS The Hyperbolastic regression of type II analysis indicated ejection fraction [P-value < 0.001, Odds Ratio = 0.97, 95% CI: (0.95, 0.98)] was the most significant predictor of death, followed by age [P-value < 0.001, Odds Ratio = 1.22, 95% CI: (0.92, 1.62)], serum creatinine [P-value < 0.001, Odds Ratio = 1.41, 95% CI: (1.16,1.72)], and creatinine phosphokinase [P-value = 0.042, Odds Ratio = 1, 95% CI: (1,1)]. The overall correct classification of death status predicted by the model was 68%. The area under the ROC curve was approximately 0.81 [P-value < 0.001, 95% CI: (0.76,0.86)]. DISCUSSION / CONCLUSION Ejection fraction, which measures the percentage of blood leaving the heart each time it contracts, was found to play the most significant role in predicting patients' death due to heart disease.

Category: 6.0 - Data Science / Big Data - 6.03 - Computational Biology - RESEARCH ABSTRACT

Grant Support: Research Centers in Minority Institutions (Grant Number: U54MD007586)

COMPUTATIONAL ANALYSIS OF SARS-COV-2 ORF3A PROTEIN MUTATIONS

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Abstract

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has sparked a global health emergency, and one of its key viral determinants is the ORF3a protein. This protein has been linked to the induction of cell and tissue damage, disease severity, and cytokine storms, which are a leading cause of COVID-19-related deaths. Understanding the mechanisms of pathogenesis of SARS-CoV-2 requires a comprehensive analysis of ORF3a protein mutations. In this study, we conducted a study utilizing computational saturation mutagenesis approaches. Our methodology included structure-based energy calculations and sequence-based machine learning predictions to investigate the effects of ORF3a coding mutations on protein stability and protein-protein interaction. Our findings revealed that mutations in residues P159 and L203 can lead to a decrease in ORF3a stability. Additionally, we computed the binding energy changes upon mutations in the protein interface and discovered that missense mutations in residues G188 and G187 can weaken the binding affinity of ORF3a dimer. These results provide valuable insights into the molecular mechanism of ORF3a in the pathogenesis of SARS-CoV-2. Our study highlights the importance of investigating the effects of ORF3a mutations on protein stability and protein-protein interactions to understand the mechanisms of pathogenesis of SARS-CoV-2.

Category: 6.0 - Data Science / Big Data - 6.02 - Biomedical Informatics - RESEARCH ABSTRACT

POLYGENIC BASIS OF RACIAL DISPARITY IN PROSTATE CANCER

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Abstract

PURPOSE: Prostate cancer (PCa) prevalence in African Americans (AAs) is over 1.5 times the prevalence in European Americans (EAs). Among over a hundred index risk SNPs for PCa, only a few can be verified using the available AAs' data. Their relevance to the prevalence inequality and other racial disparities has not been fully determined. We investigated this issue by an integrative analysis of five public datasets. METHODS: We categorized the datasets into two classes. The training class consisted of the datasets generated by three genome-wide association studies. The test class contained the TCGA prostate carcinoma data and the data of African and European super-populations in the 1000-Genome project. The polygenic risk scores (PRS) of test samples for cancer occurrence were calculated according to the effects of genetic variants estimated from the training samples. RESULTS: We obtained the following findings. Africans' PRSs are higher than Europeans' scores ($p << 0.01$); AA patients' PRSs are higher than EA patients' scores ($p<3\times10\text{-}9$); the patients with tumors presenting fusion or abnormal expression in ERG and other ETS family genes have lower PRSs than the patients without such aberrations ($p < 7\times10\text{-}5$); five tumor progression-related genes have the expression levels being significantly correlated with PRS (FDR<0.01). Additional simulation analysis shows that the high PCa prevalence in African populations makes it challenging to identify individual risk variants using African men's data. DISCUSSION: The index risk SNPs-based PRS is compatible with the observed racial disparity in PCa prevalence, and ETS abnormal cancers may be less heritable compared to other subtypes. This study reveals the relevance of index risk SNP markers with racial disparities in PCa. The findings also indicate that PRS can be used in PCa subtype prediction.

Category: 6.0 - Data Science / Big Data - 6.05 - Genomics - RESEARCH ABSTRACT

Grant Support: the NIH grant 5U54MD007595

7.0 - HEALTH AND HEALTHCARE POLICY RESEARCH

ROLE OF COMMUNITY RESEARCH IN ASSESSING POLICY CHANGE

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Abstract

Nutritional outcome assessment should follow rigorous methodology to address the limitations of administrative and healthcare derived data sources. Implications of systemic approaches is further enhanced among groups faced by the prevailing nutritional deficiencies secondary to an abysmal food security benefit cliff. The need to inform changes in health investments is even more significant among understudied populations that cannot rely on established health surveillance systems as a source. Our main objective is to demonstrate the influence of sustained investments on community-based partnerships to inform nutritional policy change among vulnerable populations. Results from the nutritional survey implemented as part of The Baby Act Trial, a community-based lifestyle intervention implemented in collaboration with the WIC program; provided the resources to demonstrate the degree of fruit and vegetable consumption by women during their third trimester of pregnancy before and after the change was enacted among Puerto Rico residents. This contribution addresses the void that emerges from the lack of inclusion in national nutritional surveys. To fill the gap in the data publicly available, we defined compliance with a reported consumption of at least once a day as established in studies performed among residents of the continental United States. The BAT cohort has contributed with 526 surveys. The percentage of compliance with at least daily fruit consumption within the cohort was 51.4%, and 24.9% for vegetables. The rate of compliance is higher than what has been established for Hispanic adults living in the states, and above the range reported by adults living in the territory for fruits, but significantly below what was reported for vegetables using the BRFSS as the only population-based data source currently available. The need to inform the magnitude of effect of nutritional health investments at critical life stages requires sustained surveillance to guide policy decisions.

Category: 7.0 - Health and Healthcare Policy Research - 7.02 - Health Policy - RESEARCH ABSTRACT

Grant Support: The research/publication/press release was supported by Award Number U54 MD007600 from the National Institute on Minority Health and Health Disparities and the National Institute of General Medical Sciences (NIGMS)– National Institutes of Health under the Award Number U54GM133807

8.0 - HEALTH RELATED TECHNOLOGY APPLICATION

COUNTERACTIVE SIGNALS TO MITIGATE SEIZURES

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Abstract

PURPOSE: Neurons are the basic units of the central nervous system. Although age and gender are some of the deciding factors on the total number of neurons in the brain, it was estimated that an adult human brain has around 85 billion to 105 billion neurons. It is well known that all electrochemical signals are transmitted from one neuron to another through multi-synaptic connections. Such electrochemical signals, called neurotransmitters, are either excitatory or inhibitory type. While a balance exists between these neurotransmitters in the brain for normal functioning, their imbalance can result a misfire of many neuronal signals leading to a seizure. Epilepsy is not a disease but a disorder of the abnormal recurring electrical firing of the brain. The etiology of this disorder is largely unknown. Even though several anticonvulsant drugs are currently available in the market, about one-third of epilepsy patients don’t respond to medication. In contrast, the remaining patients experience undesirable side effects on the normal body. These shortcomings have necessitated exploring non-pharmacological interventions for a better therapeutic outcome. Here, we investigated the potential of counteractive signals against excess firing based on a computer simulation. METHODS: Human seizure data was obtained from Time vs Amplitude plot from literature. A proportional integral

derivative (PID) based control system was developed using LabView software. The input to the control system was a time series of electrical signals (in microvolts), while the control system analyzed the input signal and generated a phase-biased signal to dampen the input signal. RESULTS: It was found that the output signal from the software was same as the controlled signal. CONCLUSION: The proposed model will provide an efficient method to mitigate and counteract the excessive firing of neurons during seizures. Once optimized with more data, the proposed control can be implemented in a wearable device.

Category: 8.0 - Health Related Technology Application - 8.01 - Health-Related Technology Application in Minority and Health Disparities - RESEARCH ABSTRACT

Grant Support: Research supported by National Institute of Minority Health and Health Disparities of the National Institutes of Health through Grant Number U54 MD007582 and Grant Number P20 MD006738.

A NEW APPROACH FOR ACTIVE CORONAVIRUS INFECTION IDENTIFICATION BY TARGETING THE NEGATIVE RNA STRAND- A REPLACEMENT FOR THE CURRENT POSITIVE RNA-BASED QPCR DETECTION METHOD

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Abstract

The current COVID-19 pandemic effects are prolonged by the continual development of virus variants allowing the virus to enhance their ability to evade their host immune systems and decreasing the effectiveness of current pharmaceutical treatments. The identification of viral targets that are indispensable for the virus can be targeted to inhibit mutation-based new escape variant development. This would have the dual benefit of preventing the virus from spreading and of providing the targeted individuals with a potential therapeutic option. The 5'-PolyU tract of the antigenome offers such a target. Host cells do not harbor 5'-PolyU tracts on any of their transcripts, making the tract an attractive, virus-specific target. Here, we show that targeting this unique target led to the inhibition of the virus replication as well as inhibition of virus induced syncytium formation. In addition, The current positive RNA-based qPCR detection systems are unable to discriminate between replicating and non-replicating viruses, complicating decisions related to quarantine and therapeutic interventions. This is particularly problematic for viruses that are potentially dangerous or can lead to illness. Here we develop a method to detect the negative strand that a replicating virus harbors. This new method can replace the current positive strand specific qPCR tests to allow distinguishing an infectious person from non-infectious persons. Adoption of this new method should guide better public health measures during the pandemic.

Category: 8.0 - Health Related Technology Application - 8.01 - Health-Related Technology Application in Minority and Health Disparities - RESEARCH ABSTRACT

ADDRESSING POSTPARTUM WEIGHT IN BLACK WOMEN THROUGH MOBILE APPS

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Abstract

PURPOSE: Persistent obesity is linked to excess weight retention in postpartum women. Women of color are at increased risk for both persistent obesity and postpartum weight retention. Chronic obesity is linked to a number of negative health outcomes. Community-based and technological approaches have emerged as promising efforts to address health in communities of color that are often failed by conventional recruitment and intervention delivery approaches. This qualitative formative work was conducted to inform and test a mobile health application designed to address postpartum weight in Black women. METHODS: Women who identified as African American or Black were recruited from an obstetrics clinic in Washington D.C. to participate in a qualitative study. The purpose of this formative qualitative work was to 1) assess technology patterns and uses, and 2) identify barriers, challenges, facilitators, and resources to addressing postpartum weight retention. We conducted three focus groups and three in-depth structured interviews, which were audio-recorded and transcribed. Content analysis was conducted to develop a code taxonomy and patterns of responses were documented. Findings guided the development of a

prototype mHealth intervention, #BeFAB (Be Fabulous After Baby). RESULTS: The sample consisted of 30 postpartum women. Participants reported a lack of centralized information and difficulty accessing resources. Information specific to the local community was highly desired. Notably, there was significant interest in receiving postpartum health-related content and leveraging technology to disseminate information was supported. CONCLUSION: A technology-based approach that leverages credible and actionable content and addresses barriers to improve health literacy related to postpartum weight management is a promising approach.

Category: 8.0 - Health Related Technology Application - 8.01 - Health-Related Technology Application in Minority and Health Disparities - RESEARCH ABSTRACT

Grant Support: This study was funded by National Institutes of Health 1R21MD011652-01

FAST OPTICAL DETECTION AND DISCRIMINATION OF VIRAL PATHOGENS

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Abstract

Fast detection of viral pathogens is essential towards reducing morbidity and mortality. Using unique spectral signatures of absorption or emission spectra in identifying pathogenic viruses would be considerably faster than current gold-standard molecular tests that extract viral ribonucleic acid (RNA) from patients' samples (saliva or bronchial lavage fluid / nasal swab), reverse transcribe the RNA to complementary DNA (cDNA), and then use polymerase chain reaction (PCR) to amplify specific sequences of the viral genome. Although current detection assays of the viral pathogens are reliable, they are costly, time-consuming, and require scarce laboratory reagents and consumables during pandemics. Fast spectroscopic detection methods would thus have a direct and profound clinical impact. Underserved populations, especially those in rural or remote locations where current methods may be unavailable, would benefit greatly from such a novel test. Various Raman scattering techniques have demonstrated efficacy in distinguishing extant and emerging viruses. Recent experimental efforts with pulsed irradiation on virus-templated dye complexes have demonstrated the important role that superradiance in these complexes can play in fluorescence imaging applications. However, these studies were limited by the lack of theoretical insight into the collective optical response of organized chromophore networks in viral scaffolds. Hence, we built a stoichiometrically accurate atomistic model of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) exterior tryptophan chromophore network, including spike trimer, membrane protein, and our homology model of nucleocapsid protein structures from the Protein Data Bank (PDB). We computed the single virion's UV superradiant enhancement in the absence of disorder at more than one thousand times the single-tryptophan spontaneous emission rate and distinguished markedly its simulated optical responses from smaller, more common viruses.

Category: 8.0 - Health Related Technology Application - 8.01 - Health-Related Technology Application in Minority and Health Disparities - RESEARCH ABSTRACT

Grant Support: RCMI

IMPLEMENTATION OF THE FAMILY HISTORY AND CANCER RISK STUDY (FOREST) AT MEHARRY

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Abstract

PURPOSE: Family Health History (FHH) is a key factor in assessing cancer risk, yet health providers often do not have adequate time or resources to collect FHH systematically. Medically underserved populations, including African Americans, suffer significantly higher cancer incidence or mortality. We believe that they could benefit if FHH risk were better defined. Our study aims to implement a patient-facing web-based FHH cancer risk assessment platform (MeTree) in a clinic with a high proportion of underserved patients at Meharry Medical College (MMC) and a cohort at Vanderbilt University Medical Center (VUMC). METHODS: Our team and the MMC Community Engagement Core conducted two virtual Community Engagement Studios (CES) with 12 minority community members from North Nashville, TN. CES

recommendations were used for the pre-implementation planning of the FOREST study. Topics of concern were: 1) medical data privacy, 2) potential benefits, and 3) proper informed consent of patients. In-person recruitment allowed direct assistance from the clinical research coordinator (CRC) at a staffed table outside the Meharry Family & Community Medicine Clinic (MFCMC) waiting room. Hybrid recruitment involved flyers with QR codes to connect patients and the CRC electronically. RESULTS: Overall, 21 patients enrolled, 15 completed the eligibility survey. 14 patients enrolled via in-person recruiting, and 7 enrolled via QR-code hybrid workflow. In-person recruitment had a 64% patient progression into enrollment phases; hybrid recruitment had 80%. Notably, the hybrid approach had a 40% completion rate versus a 14% in-person. DISCUSSION/CONCLUSION: We observed higher volumes from in-person recruiting workflow, yet a lower rate of completion, 14% versus 40% for the hybrid. Next steps involve scaling up enrollment by actively contacting patients electronically and adding in-clinic recruiting.

Category: 8.0 - Health Related Technology Application - 8.01 - Health-Related Technology Application in Minority and Health Disparities - RESEARCH ABSTRACT

Grant Support: NIH/NIMHD-U54MD007586 (Meharry) and NIH/NCI-U01CA232829 (VUMC)

9.0 - RESEARCH IN SPECIAL POPULATION SUB-GROUPS

MIGRAINE HEADACHE AMONG AFRICAN AMERICAN OLDER ADULTS

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Abstract

PURPOSE: This study examines the associations between migraine headaches, well-being, and health care use among a sample of underserved older African American (AA) adults. Controlling for relevant variables, the association between migraine headaches and 1) health care utilization, 2) health-related Quality of Life (HRQoL); and 3) physical and mental health outcomes was examined. METHODS: Our sample included 760 older AA adults from South Los Angeles recruited through convenience and snowball sampling. In addition to demographic variables, our survey included validated instruments, such as the health-related quality-of-life questionnaire (SF-12), Short-Form McGill Pain Questionnaire (SF-MPQ), and the Geriatric Depression Scale (GDS). Data analysis included 12 independent multivariate models using multiple linear regression; log transferred linear regression; binary and multinomial logistic regression; and generalized linear regression with Poisson distribution. RESULTS: Having migraine was associated with three categories of outcomes: 1) higher level of health care utilization measured by (i) emergency department admissions, and (ii) number of medication use; (2) lower level of HRQoL and health status measured by (i) lower self-rated health (ii) physical QoL, and (iii) mental QoL; and (3) worse physical and mental health outcomes measured by (i) higher number of depressive symptoms, (ii) higher level of pain, (iii) sleep disorder, (iv) and being disabled.
DISCUSSION/CONCLUSION: Migraine headache significantly influences quality of life, health care utilization, and many health outcomes of underserved AA middle-aged and older adults. Diagnoses and treatments of migraine among underserved older AA adults require multi-faceted and culturally sensitive interventional studies.

Category: 9.0 - Research in Special Population Sub-Groups - 9.01 - Aging Research - RESEARCH ABSTRACT

Grant Support: Research reported was supported by the National Institute of Minority Health and Health Disparities under award numbers U54MD007598 and R25 MD007610

EXPLORING THE DIMENSIONS OF FOOD INSECURITY AMONG OLDER ADULTS

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Abstract

PURPOSE: Food insecurity impacts the lives of 5.2 million adults aged 65 and older in the U.S. Empirical studies link food insecurity to diminished physical health. This study aimed to examine the nature of food insecurity among a sample of participants 65 years and older residing in a north Florida county. DESIGN METHODS: Using a purposive sample (n=359), this study conceptualizes food insecurity as multi-dimensional, encompassing the lack of food and how individuals adapt. Thus, food insecurity was measured using two dependent variables: (1) worrying if food would run out and (2) food did not last for the month, skipped meals, or cut portions. RESULTS/EXPECTED RESULTS: The data were analyzed using logistic regression. The results revealed that younger individuals (OR = .92, 95% CI [.89, .96]), those who received food assistance (OR = 2.96, 95% CI [1.77, 4.92]), those with poorer health status (OR = .60, 95% CI [.41, .87]), and those who were not confident that they could find solutions to their problems (OR = .68, 95% CI [.51, .89]) were likely to report experiencing food insecurity. DISCUSSION/CONCLUSION: Accessing food assistance was correlated with food insecurity. We also found differences in perceived food insecurity based on health status, satisfaction with the cost of fresh produce, and the ability to find solutions to problems. Thus, public health solutions to food insecurity for older adults must be multi-dimensional in focus and approach.

Category: 9.0 - Research in Special Population Sub-Groups - 9.01 - Aging Research - RESEARCH ABSTRACT

Grant Support: GRANT SUPPORT: This research was supported by grants from the National Institute of Minority Health and Health Disparities of the National Institutes of Health through Grant Number U54 MD 007582

PRE-EXPOSURE PROPHALYXIS (PREP) USE AMONG AFRICAN AMERCIANS IN 5 CITIES

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Abstract

Purpose: To assess PrEP knowledge, attitudes, beliefs and behaviors (KABB) among 200 African American heterosexual men and women, gay men, and transgender women in 5 U.S. cities: Los Angeles, CA, Riverside, CA, Oakland, CA, Jackson, MS, and Brooklyn, NY. Methods: Study investigators administered one HIV/AIDS KABB survey (24 items), one PrEP and PEP KABB survey (27 items) and one PrEP and PEP Assessment Survey (49 items) to African Americans followed by a focus group assessing PREP/PEP KABB, HIV/AIDS community norms, HIV/AIDS primary prevention, sexual health, and safer sex practices. To be recruited, subjects had to be 18 years of age or older; male or female identifying as heterosexual, bisexual, or homosexual or a transgender woman. Additionally, subjects had to be sexually active; speak English or be Bi-lingual in Spanish. Subjects had to provide written consent to participate and they could be either HIV positive or HIV negative. RESULTS: To date, a total of 125 individuals have been recruited into the study. Approximately, 42 females, 33 men; 37 gay men and 13 transgender women. Thirteen respondents had less than a high school education; 43 had graduated from high school; and 39 had a college education. One hundred and ten had some form of insurance; 61 had an annual income equal to or less than $10,000; 44 were aged 18 to 40; and 51 were 41 years of age or older. Discussion: Respondents had major concerns with PrEP and/or PEP including: the cost of PrEP; side effects associated with PrEP; HIV/AIDS stigma; and lack of knowledge of PrEP and PEP. In several focus group sessions, subjects stated they did not trust the health care system due to past unethical experimentation on Blacks by the federal government. HIV/AIDS stigma, accessibility, cost and lack of knowledge on PrEP and PEP limit their uptake.

Category: 9.0 - Research in Special Population Sub-Groups - 9.08 - Lesbian, Gay, Bisexual, Transgender, Questioning, and Intersex (LGBTQI) - RESEARCH ABSTRACT

Grant Support: This research was supported by grant 5U54MD007598-10 of the NIMHD and the AXIS Pilot Demonstration Project

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LOTS OF WORK: QUALITATIVE FINDINGS ON BLACK MATERNAL EMPLOYMENT DURING PREGNANCY FROM LOUISIANA PRAMS AND IMPLICATIONS FOR BETTER WORKPLACE SUPPORT

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TT GROSS, AM GRANGER, AD THIERRY
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Abstract

BACKGROUND: Black women experience the earliest return to work after childbirth compared to women of other racial backgrounds. Understanding the type of employment and work responsibilities of pregnant Black women can lead to better workplace supports and maternal health outcomes. PURPOSE: To explore the type of employment Black women in Louisiana have during pregnancy. METHODS: Secondary data from the Louisiana Pregnancy Risk Assessment Monitoring System (PRAMS) from Phase 8 years 2016-2018 was obtained and only Black women were included. Qualitative responses about employment during most recent pregnancy were examined for the item "What was your job title and what were your usual activities or duties?" Additionally, 'back page comments' related to employment on the last page of the questionnaire were also examined. Text analysis ranked the most common positions. Word Clouds visualized patterns and frequently mentioned work tasks. RESULTS: During their most recent pregnancy, 897 participants responded to working for pay. The majority worked in blue-collar, lower wage positions in industries such as retail, hospitality, and home healthcare. Cashier and sales associate were the most common work titles. Typical work duties included serving customers, cooking food, caring for patients, and cleaning. Back page comments noted several women lost jobs during pregnancy, experienced tensions balancing work during pregnancy and/or had a lack of paid maternity leave. CONCLUSION: Black women were largely employed in low wage, hourly, "frontline worker" positions. These types of jobs can add additional physical and mental stress to a population already disproportionately impacted by maternal health disparities. PRAMS data can be used to further explore the impact of employment on pregnancy outcomes. Workplace wellness initiatives could improve the health of Black women across the life course as well as advocating for better workplace accommodations during pregnancy and postpartum.

Category: 9.0 - Research in Special Population Sub-Groups - 9.12 - Women's Health - RESEARCH ABSTRACT

Grant Support: Xavier RCMI NIMHD grant No. 5U54MD007595

INVESTIGATING THE EFFECT OF SEAWEED ON REPRODUCTION IN WOMEN OF CHILDBEARING AGE.

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HOWARD UNIVERSITY

Abstract

PURPOSE Maternal nutrition during pregnancy is a major determinant for birth outcomes. Thus, maternal nutritional intake such as iodine and iron are necessary for both mother and baby to thrive. Seaweeds are a major source of iodine and iron, and its use has been long established in Asian cooking and now gaining popularity in the Western diet. Despite its numerous benefits, iron and iodine deficiency continue to increase amongst pregnant mothers, their infants, vegans, or women of childbearing age. The purpose of this study is to investigate the effect of seaweed on reproduction in women of childbearing age. METHODS A full text, English only publications was searched on PubMed, Google Scholar, and Web of Science, published within 2017 to 2022. Nine search terms were utilized on PubMed, the search resulted in 22 studies. Out of these studies, one met pre-determined eligibility criteria for inclusion. On Google scholar and Web of Science, the search resulted in 9200 and 38 studies respectively. Out of these studies, three and one studies met the pre-determined eligibility criteria respectively. The total relevant publication summed up to five studies. RESULTS One study investigated the association of dietary patterns with Small for Gestational Age (SGA) in pregnant women. Three studies examined the association between seaweed-derived iodine intake and thyroid function during/after pregnancy. One study investigated the effect of seaweed consumption on hemoglobin levels of anemic pregnant women in the first trimester. CONCLUSIONS Regular intake of seaweeds is associated with a reduced risk of SGA. Consuming seaweed has a significant effect on increasing hemoglobin in anemic pregnant women, and there was no significant increase in subclinical hypothyroidism with seaweed soup consumption after childbirth. Consumption of seaweed can contribute to improving the overall birth outcomes for both the baby and the mother.

Category: 9.0 - Research in Special Population Sub-Groups - 9.12 - Women's Health - RESEARCH ABSTRACT

Grant Support: Not applicable.

COVID-19 PERCEPTIONS PROMPT HEALTHIER EATING IN OLDER ADULTS

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Abstract

PURPOSE Unhealthy diets are associated with chronic health conditions and excess mortality. Many older African Americans do not meet dietary guidelines, which may have worsened during the COVID-19 pandemic. The health belief model was used to understand how individuals' perceptions and knowledge of COVID-19 influenced the dietary habits of older African Americans during the COVID-19 pandemic. METHODS Older AA living in South LA between 2021 and 2022 completed Diet History Questionnaire (DHQ) III, questionnaires related to the perceived threat of COVID-19, knowledge of COVID-19 symptoms, and socio-demographic information. The DHQ III is a validated instrument comprised of 135 foods and beverages consumed in the past year. DHQ III reports were used to calculate the healthy eating index (HEI)-2015, a measure of diet quality based on the U.S. Dietary Guidelines for Americans. Indices were computed for COVID-19 perceived threat and COVID-19 symptoms knowledge. RESULTS Older African Americans (n=118; age 55-91; 70% female) completed all questionnaires. The majority (86%) had at least a high school education. About 63.5% of participants reported good or better physical health. After controlling for confounding variables, perceived threat of COVID-19 (p=0.003), and increased knowledge of COVID-19 symptoms (p=0.005) were positively and significantly associated with diet quality. CONCLUSION Consistent with the health belief model, perceptions of susceptibility and knowledge of COVID-19 symptoms prompted healthy eating behavior, presumably to mitigate the risk of COVID-19 illness. This was independent of other mediating factors such as financial strain or education. These findings underscore the significance of accurate media and provider education in promoting health behaviors.

Category: 9.0 - Research in Special Population Sub-Groups - 9.01 - Aging Research - RESEARCH ABSTRACT

Grant Support: National Institute on Minority Health and Health Disparities: U54MD007598 National Institute on Minority Health and Health Disparities: R25 MD007610

BIRTH EXPERIENCES AND MENTAL HEALTH IN PUERTO RICO FOLLOWING COVID 19: QUALITATIVE RESULTS

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Abstract

PURPOSE: The specific aims of the project are: 1) Examine the impact of COVID-19 in pregnancy experiences and outcomes; 2) Examine the mental health impact of COVID-19 in pregnant women and mothers of children 12 months or younger; 3) Identify risk and protective factors among this population in Puerto Rico. DESIGN METHODS: Participants were recruited from the Puerto Rico Team for Exploring Contamination Threats (PROTECT) Superfund Program which is composed of pregnant women and mothers from the northern karst region of Puerto Rico. The research had a mixed methods approach with a quantitative survey (n=184) and qualitative interviews (n=10); data collection was done remotely. RESULTS: Findings from the qualitative interviews highlight the experiences regarding access to healthcare services, pregnancy and birth experiences, social support, mental health during the pandemic among women with young children. These narratives serve to illustrate the particular challenges and opportunities that the participants faced during the year 2021 in regards to maternal health in Puerto Rico. DISCUSSION: COVID-19 restrictions impacted the experiences in receiving healthcare services, particularly regarding the birthing process and also the participants mental health. Social support, particularly from family, was found to be a protective factor for facing the challenges during pandemic times. We expect that the findings can lead to the development of interventions for community health centers and parents/ caretakers in Puerto Rico.

Category: 9.0 - Research in Special Population Sub-Groups - 9.12 - Women’s Health - RESEARCH ABSTRACT

Grant Support: This project is supported by the Center for Collaborative Research in Health Disparities (CCRHD), which is funded by an RCMI-Grant from the National Institute on Minority Health and Health Disparities (U54 MD007600) at the University of Puerto Rico, Medical Sciences Campus and also a research project funded by the National Institute of Environmental Health Sciences, National Institutes of Health (P42ES017198).

ACE2 STABILITY AND BINDING AFFINITY IN MINORITY POPULATIONS

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Abstract

Ethnic and racial diversity can have a significant impact on the stability of ACE2 protein binding affinity. By studying these genetic variations in minority populations, we will gain greater insight into how to protect them against health risks associated with the virus. In our study, we applied computational saturation mutagenesis approaches to determine the which ACE2 mutations affect protein stability and binding affinity in ACE2- S complexes in the SARS-CoV-2 wild-type and Omicron strains. We observed the missense mutations in ACE2 residues D30 and N330 causing an increase in binding affinity in both complexes. We also identified ACE2 genetic variations in African Americans (rs73635825, rs138390800, and rs766996587) and Latin Americans (rs73635825 and rs781255386) affecting binding affinity in both complexes. Our findings in this study can aid in designing more stable neutralizing peptides to treat patients from underprivileged ethnic groups.

Category: 9.0 - Research in Special Population Sub-Groups - 9.05 - Immigrant / Migrant Populations - RESEARCH ABSTRACT

BARRIERS ALONG THE PREP CONTINUUM AMONG MSM IN PUERTO RICO

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Abstract

PURPOSE: Puerto Rico (PR) is a priority-Phase 1 jurisdiction in the Ending the HIV Epidemic initiative. Pre-exposure prophylaxis (PrEP) is an effective biomedical tool to prevent HIV infection. Latino men who have sex with men (MSM) are at increased risk for HIV, yet they report low PrEP uptake. The objective of this study is to describe barriers along the PrEP care continuum among MSM in PR. METHODS: Between 2019 and 2020, we conducted a web-based survey to assess sexual risk practices, PrEP attitudes, awareness, and use/potential use, followed by qualitative interviews to explore barriers through the PrEP care continuum among MSM in PR. RESULTS: A total of 100 MSM answered the survey. Participants learned about PrEP mainly from the internet, social media, or dating apps (n=72, 50.7%), friends (n=39, 27.46%), and less from healthcare providers (n=9, 6.34%). Barriers to uptake and adherence included costs of medication and laboratories (n=24, 9.56% each) and worries regarding side effects and forgetfulness (n=42, 16.73% each). Qualitative data from 14 MSM and 12 healthcare providers supported quantitative findings. There is a need to promote PrEP: 'For the most part, I think that promotions, posters, educational talks should increase a little more, even spots on television, anything about PrEP-MSM, #05'. Costs and insurance barriers: 'Well, the issue of the role of medical plans in the cost of this [PrEP], which seems incredible that they cover other medications and not this.-MSM, #14'. Also, worries regarding side effects: 'The one that causes me some kind of damage to an organ-MSM, #12'. CONCLUSIONS: Results suggest the need for strategies strengthening the PrEP care continuum indicators of awareness, uptake, adherence and retention, to achieve the goals of ending the HIV epidemic. These results will inform the adaptation of an intervention to increase PrEP uptake among MSM in PR, a study supported by RCMI-CCRHD (2U54MD007600-36).

Category: 9.0 - Research in Special Population Sub-Groups - 9.08 - Lesbian, Gay, Bisexual, Transgender, Questioning, and Intersex (LGBTQI) - RESEARCH ABSTRACT

Grant Support: RCMI-CCRHD (2U54MD007600-36)

PROMOTING EQUITY IN LONG-ACTING-REVERSIBLE-CONTRACEPTIVE USE IN US

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Abstract

Purpose: Long-acting reversible contraceptives (LARCs) are highly effective birth control methods with high satisfaction and continuation rates among users. Significant disparities exist in LARC utilization across population subgroups in the United States. This study investigates the associations between LARC utilization and various demographic and health insurance status. While overall data suggest minority women use LARC at lower levels than white women, our study examines LARC uptake in the immediate postpartum period (IPP) and the high usage rate in this setting. Methods: This cross-sectional study analyzed data from the National Inpatient Sample (NIS) database between January 2016 and December 2020, focusing on utilizing LARCs among women. The multivariate analysis examined the associations between LARC utilization and demographic characteristics, and hospital parameters. The sample was weighted to generate national estimates. Results: Our analysis identified 15,279 cases of LARC utilization among women in the NIS from 2016 to 2019. Of these cases, 34.5% were Hispanic, 28.4% were Black, and 24.5% were White women. The median age of LARC users was 27 years (IQR 22-32), and 75.9% of users utilized Medicaid, while 18.2% had private insurance. Significant predictors of LARC utilization included Black (OR=2.08; 95% CI 1.98-2.18) and Hispanic (OR=2.59; 95% CI 2.47-2.71) race, Medicaid insurance (OR=3.23; 95% CI 3.09-3.38), and age 15-29 years (OR=1.71; 95% CI 1.64- 1.78). Other notable factors influencing LARC utilization were health-related and hospital characteristics, such as location, bed size, and teaching status. Conclusion: Our study identified significant racial, age, and insurance-related disparities in LARC utilization among women in the United States. Medicaid insurance, younger generation, and minority ethnicity emerged as significant predictors of increased LARC use. Understanding the factors associated with LARC utilization can inform the development of targeted

Category: 9.0 - Research in Special Population Sub-Groups - 9.12 - Women's Health - CLINICAL PRACTICE ABSTRACT

Grant Support: None

URINARY INCONTINENCE CARE IN RACIALLY DIVERSE OLDER WOMEN

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Abstract

PURPOSE: Urinary Incontinence (UI) is a common pelvic floor disorder and a geriatric syndrome among older women. UI is also prevalent with even a greater negative impact on emotional health among women of racially diverse backgrounds. The aims of the study were to 1) assess the feasibility of a three-month multimodal UI program for racially diverse older women suffering from UI; and 2) evaluate UI and physical performance in this population. METHODS: This was a feasibility randomized clinical trial of a three-month pelvic floor muscle training with and without multimodal strengthening and aerobic conditioning rehabilitation program. Women underwent UI and physical performance evaluation. The primary outcome was a reduction of total UI episodes based on three-day bladder diary after the intervention. Objective physical performance measures were utilized. Descriptive statistics described the demographics of the participants, and inferential statistics (paired sample t-test) compared the means. The p-value ≤0.05 was statistically significant. RESULTS: Women were 73.2±4.8 years old with mean body mass index 30.0±6.6 kg/m2. There were 77.8% (n=14) Black, 16.7% (n=3) Hispanic, and 5.6% (n=1) African-Dominican (mixed race) women. Ethnic distribution included 72.2% (n=13) non-Hispanic and 27.8% (n=5) Hispanic. Due to the COVID-19 pandemic, only 7 participants completed the intervention. There was a significant reduction in total UI episodes from 8.9±7 to 0.7±1.2, p=0.03 before and after the intervention, respectively. The Global Patient Impression of Severity decreased from 2.9±1.4 to 2.0±1.3, p=0.05. All other UI measures also improved. The improvement in objective physical performance measures did not reach statistical significance, except the time needed to put on and off jacket decreased from 9.5±1.9 secs to 7.3±1.1 secs, p=0.05. DISCUSSION: Three-month multimodal UI program for racially diverse older women suffering from UI is feasible. Women reported improvement in UI.

Category: 9.0 - Research in Special Population Sub-Groups - 9.01 - Aging Research - RESEARCH ABSTRACT

Grant Support: This study was supported by the University of Maryland Building Interdisciplinary Research Careers in Women's Health program (K12 HD43489), University of Maryland Claude D. Pepper Older Americans Independence Center (P30 AG028747), Georgetown-Howard Universities Center for Clinical and Translational Science (UL1TR001409), and a grant from the National Institute on Aging (R03 AG053281).

HERBAL THERAPEUTIC VERNONIA AMYGDALINA ATTENUATES PROLIFERATION OF HPV INDUCED HELA CELL LINE

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Abstract

Cisplatin has been known to have the following adverse effects on Cervical Cancer patients: nausea, temporary hair loss, loss or inability to taste food, dry mouth, decreased sweating and abnormally dry skin. Vernonia Amygdalina (VA), is a perennial herb found in the wild of most countries in tropical Africa, Somalia, and Yemen, belonging to the Asteraceae family. Extracts of the plant have been used in various folk medicines as remedies. The benefits of this therapeutic drug have shown to be prevalent at Jackson State University in breast cancer (Izevbigie et.al,2002,2004,2009, 2010 Yedjou et.al 2008; Howard, et. al 2016) and acute promyelocytic leukemia (Yedjou et. al, 2018). Previous papers published by Howard et.al, 2016, suggest that VA has synergistic effects with the normal standard of care (SOC) for triple negative breast cancer. Therefore, in this study we want to determine if VA will have synergistic effects with cisplatin the SOC for cervical cancer cells in vitro. We hypothesized that V.A. extracts will attenuate cervical cancer growth in synergy with the current SOC, cisplatin. To achieve our objective, we will treat HeLa NR1 cell culture assays with varying doses of cisplatin alone, V.A. extracts alone, and cisplatin with varying doses of V.A. extracts for 72 hours. We hope that this study will help to determine which molecular pathway V.A. extracts work through and if it could be a potential herbal therapeutic to attenuate the proliferation of cervical cancer cells.

Category: 9.0 - Research in Special Population Sub-Groups - 9.12 - Women's Health - RESEARCH ABSTRACT

Grant Support: This study is supported by NIMHD grant: G12MD007581

EVALUATING HEALTH EDUCATION MATERIALS IN A DIVERSE RURAL BORDER COMMUNITY: A PILOT PROJECT

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Abstract

PURPOSE In the clinical setting, health education (HE) is often delivered in a rushed manner using one-way communication techniques and limited time for assuring patient comprehension. Healthcare organizations (HCOs) rely on industry-developed standardized HE materials that lack colloquial relevance to support patient education practices. The purpose of this study was to describe the readability, understandability and actionability of HE materials and determine if they were culturally and linguistically appropriate for the population they serve. METHODS Written Spanish and English HE materials (n=56) were collected for 10 common diagnoses at a rural-border HCO located in Southern California. Materials were analyzed for understandability and actionability using the Patient Education Materials Assessment Tool for Printable Materials (PEMAT-P) and grade readability using the Simple Measure Of Gobbledygook (SMOG). The HL level of a sample of patients served by the HCO (n=910) was also measured using the Newest Vital Sign (NVS). RESULTS HE materials were similar in terms of actionability for English (54.0%, SD 20.4%) and Spanish (54.5%, SD 18.12%) versions of the document with consistent readability scores of 8.5 (SD 1.5) and 8.6 (SD 1.2) respectively. Similarly, Spanish materials were slightly less understandable (72%, SD 9.56%) than the English version (76%, SD 9.29). Of those sampled, 79.8% have either likely or possibly limited health literacy despite 72.5% of the sample reporting at least a high school or college education. DISCUSSION HE materials are critical tools in the educational process and HCOs must ensure materials are not only culturally and linguistically appropriate, but also support diverse health literacy needs while providing actionable steps for the patient to consider. Further research is needed to determine how best to incorporate elements of comprehension and actionability into standard HE materials that still meet the needs of diverse populations.

Category: 9.0 - Research in Special Population Sub-Groups - 9.01 - Rural Health - RESEARCH ABSTRACT

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ENTRE HERMAN@S: USING SIBLING TO PROMOTE PREP TO LATINX MSM

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Abstract

PURPOSE Family ties affect Latinx people's physical and mental health and can be leveraged in health interventions, but this resource has been overlooked for Latinx MSM (LMSM). This study sought to address the dearth of HIV-prevention family-based interventions for LMSM by focusing on sibling relationships. We answer the question: Can the siblings of LMSM be engaged to promote PrEP as a strategy for HIV prevention? We pilot-tested a novel, culturally-specific intervention, Entre Herman@s, to engage the siblings of LMSM in the promotion of PrEP. We tested for feasibility and acceptability of the intervention and implementation procedures. METHODS We used a mixed methods design and we used the Information-Motivation-Behavioral Skills and Stages of Change models to create instruments during the formative phase of the study. We then created 3 modules: PrEP Conversation with both siblings, sibling communication training, and follow-ups (30 days and 3 months). Participants completed surveys and provided feedback on the acceptability of the intervention. RESULTS We enrolled 23 sibling pairs. We found that: (1) 14 (61%) LMSM started using PrEP by 3-month follow-up. (2) 21 (91%) LMSM felt confident to talk about PrEP use with their sibling more than once by 3-month follow-up (3) 23 (100%) LMSM liked the modules and would recommend the intervention to a friend. CONCLUSION The siblings of LMSM can be engaged in PrEP promotion. HIV prevention strategies need to consider familial relationships as assets in the development of new strategies. We recommend: (1) Creating dissonance in siblings vis-à-vis LMSM's sexual health; (2) Empowering siblings to talk about PrEP; (3) Clarifying misconceptions around PrEP; and (4) Creating materials specifically for siblings.

Category: 9.0 - Research in Special Population Sub-Groups - 9.08 - Lesbian, Gay, Bisexual, Transgender, Questioning, and Intersex (LGBTQI) - RESEARCH ABSTRACT

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