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CATEGORIES AND THEMATIC AREAS

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1.0 - BASIC AND APPLIED MINORITY HEALTH AND HEALTH DISPARITIES RESEARCH

ANALYSIS OF THE CORRELATION BETWEEN MONOCYTE SUBSETS AND SERUM CYTOKINES UNDER STEADY-STATE CONDITIONS IN HEALTHY INDIVIDUALS

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Abstract

Background: In steady-state conditions, three different subsets of monocytes are detected in the circulation. These subsets of monocyte include classical (CD14++, CD16−), intermediate (CD14+, CD16+), and non-classical (CD14+, CD16++) monocytes. Classical monocytes are the most predominant among three comprising about 80–95% of circulating monocytes, expresses high level of surface CD14 and are devoid of CD16. Intermediate monocytes comprise about 2–8% where non-classical monocytes about 2–11% of circulating monocytes. In addition, certain cytokines are also detectable in the serum under steady state condition. Thus, the purpose of this study is to assess whether there is correlation between the distribution of the monocyte subsets and serum cytokine levels under steady state conditions. Methods: Whole blood was obtained from adult donors and serum was collected for cytokines (IP-10, MCP-1, IL-6) analysis using ELISA. PBMCs were isolated and monocytes were further purified through using Mojosort Isolation kit. Isolated monocytes were then stained with anti-CD14 and anti-CD16 antibodies and analyzed using SONY SA3800 cell analyzer. Results: Out of 26 samples, 13 of them had >90% of classical monocytes (Group A) and other 13 had more than 10-20% of CD16 non-classical/CD16 intermediate monocytes (Group B). Our analysis showed that Group A had higher level of IL-6, IP-10 and MCP-1 compared to Group B. Correlational analysis revealed that the percentages of classical monocytes were positively correlated with the levels of serum cytokines, where percentages of intermediate and non-classical monocytes showed inverse correlation with those cytokines under steady state conditions. Conclusion: We found evidence of correlation between serum cytokines and the distribution of monocytes subsets under steady state conditions. Further studies are underway to analyze the steady state cytokines in each of the monocyte's subsets under steady state using intracellular cytokine staining

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

APOPTOTIC GENE EXPRESSION ALTERATIONS AND INDUCTION OF CELL CYCLE ARREST BY THYMOQUINONE TOWARDS TRIPLE-NEGATIVE BREAST CANCER CELL LINES

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Abstract

PURPOSE: Cancer cell metastasis is the leading cause of death in patients with triple-negative breast cancer (TNBC). Chemotherapy is the most prevalent treatment for TNBC today, even though it can cause acquired resistance and toxicity. As a result, more than ever before, novel treatment approaches to overcome medication resistance and toxicity in TNBC patients are needed. METHODS: Thymoquinone (TQ) effects on cell viability, cell cycle, and apoptosis were tested. The expression of apoptosis-related genes was also determined with qRT-PCR. RESULT: TQ displayed cytotoxic effects on MDA-MB-468 and MDA-MB-231 cells in a time-concentration-dependent manner, with IC50 values 25.37µM and 27.39µM, respectively. Furthermore, TQ inhibited scratched cells in wound healing

assay, indicating cells were inhibited from migrating and invading the membrane in the two well insert chambers after 24 hours. Further experiments demonstrated that the apoptosis-inducing effect of TQ was related to the change of apoptosis-related gene expressions while inhibiting invasion and migration via cell cycle blocking. CONCLUSION: Due to the aggressive character of the disease and the lack of focused therapies, our findings in the apoptotic gene profile revealed numerous helpful markers, which may serve as a viable putative pharmacological target in TNBC patients. Our studies showed that TQ had potent proliferation inhibition against MDA-MB-231 and 468 cells through arresting cell cycle at S phase and inducing apoptosis, implying that TQ may be a potential lead compound for drug discovery of human 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 funded by NIH grants from NIMHD, RCMI grant U54 MD007582.

COLORECTAL CANCER SCREENING AMONG AFRICAN AMERICANS

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Abstract

PURPOSE: African Americans (AA) have lower rates of cancer screening and higher morbidity/mortality rates of colorectal cancer (CRC) when compared to non-Hispanic Whites. This study seeks to identify the factors associated with healthcare providers' recommendation on as well as participants' adherence to CRC screening (sigmoidoscopy/colonoscopy test) among underserved older African American adults. METHODS: Study participants included 740 AA older adults who reside in Service Planning Area 6 (SPA 6) of Los Angeles County. Dually designated as a medically underserved and a health professional shortage area by the United States government, SPA 6 includes the regional area of South Los Angeles. Multivariate logistic regression was employed. RESULTS: One out of three participants have never been screened for CRC. More than 30% indicated that their providers never recommended CRC screening. One out of five participants who reported that their health care provider recommended CRC had never obtained CRC screening. Controlling for other variables, the following factors: living arrangement, health maintenance organization membership, providers' recommendation, satisfaction with access to and quality of care, depressive symptoms, and gastrointestinal conditions were associated with obtaining a CRC screening test. DISCUSSION: Findings of this study reveal that the availability of providers and satisfaction with equitable access to and quality of medical care remain significant correlates for CRC screening within our study population. Interventional studies to motivate and train health care providers practicing in underserved communities to comply with screening guidelines are needed. Enhanced adherence may also be achieved with promotion of a shared provider-patient decision-making process. Additionally, policies, appropriate CRC education and culturally targeted strategies are needed to address the identified medical and sociodemographic barriers that exist in CRC screening.

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 Center for Medicare and Medicaid Services (CMS) grant 1H0CMS331621 to Charles R. Drew University of Medicine and Science (PI: M. Bazargan). Additionally, Drs. Adinkrah and Cobb were supported by the NIHMD under the award R25 MD007610 (PI: M. Bazargan).

EFFECT OF SLICING THICKNESS ON MICROGLIAL HISTOLOGY IMAGE QUANTIFICATION IN TBI

Mr. Artur Agaronyan - Howard University

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Abstract

PURPOSE Microglia are dynamic immune cells that are responsible for the support and defense of the central nervous system (CNS). Microglial morphology is diverse, and microglial roles in brain development, function, and injury repair are currently being investigated. Recent advancements in computer image analysis provide a great potential to quantify these highly variable cells in histological images. The purpose of this study is to understand how slicing thickness affects the quantification of microglial morphology in brain tissue following traumatic brain injury (TBI). METHODS Histological slides at various thicknesses were prepared from rats subjected to no-hit, one-hit, and two-hit TBI, then stained by iba1 and scanned in 3D and 2D by a confocal microscope. The images were processed by software packages for microglia analysis such as 3DMorph to determine the quality of cell detection and morphological categorization. EXPECTED RESULTS Thin slices do not provide clear information about the cell's size or shape, so thinner samples are expected to provide less reliable cell labeling, while thicker samples are expected to have more consistent results. Different brain regions may have different detection rates due to morphological changes unique to that region as well. DISCUSSION / CONCLUSION Automated quantification of microglia greatly increases the ease of analyzing microglia, particularly in big datasets. It is essential to determine the accuracy of an automated quantification model in a wide variety of real-life experiments, such as TBI experiments where microglial activation may vary greatly, and for 2D datasets due to the increased difficulty of acquiring 3D imaging compared to 2D. Based on the results of this study, the microglial software model can be fine-tuned to increase the quality of detection and categorization, and aid the research community to reliably analyze large datasets of histological images with microglia.

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

Grant Support: This study is supported by NIMHD 5U54MD007597-33

FUCOXANTHIN ANTI-CANCER EFFECTS ON GENETICALLY DIFFERENT TNBC CELLS

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Abstract

Breast cancer is the most commonly diagnosed cancer and is the second leading cause of death in women worldwide. Triple-negative breast cancer (TNBC) is an aggressive subtype of breast cancer and is mainly found in African American and Caucasian Women. The tumor microenvironment contributes to success of tumor initiation and progression leading to invasive metastasis, increased cell growth and angiogenesis. Henceforth, inhibition of these mechanisms may slow its development. Natural products show potential to inhibit proliferation and angiogenesis, induce apoptosis, and reduce breast cancer progression and tumor development. PURPOSE: In the current study the pharmacological effects of natural compound fucoxanthin, a xanthophyll, a subset of carotenoids in brown macroalgae are investigated in genetically different, MDA-MB-231 (Caucasian) and MDA-MB-468 (African American) TNBC cell lines. METHODS: Cytotoxic and cell growth assays, angiogenic arrays, RT-PCR, apoptotic and migration assays were performed. RESULTS: Fucoxanthin (1.56 - 300 µM) decreased cell viability in a dose and time-response manner in both cell lines, showing a higher potency in MDA-MB-468 cells. Fucoxanthin presented anti-proliferative effects in lower concentrations in MDA-MB-468 compared to MDA-MB-231 cells after 48 h and 72 h. 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 in the transcription and protein levels. Fucoxanthin induced apoptosis in MDA-MB-231 cells, but had no effect in MDA-MB-468 cells. Additionally, fucoxanthin inhibited migration and invasion in both cell lines, showing a higher percentage on the inhibition of

migrated cells in MDA-MB-468 cells after 72 h. CONCLUSION: Fucoxanthin may be a favorable candidate for breast cancer therapy by targeting VEGF-A, VEGF-C, reducing cell proliferation, inhibiting cell migration and invasion, and inducing apoptosis.

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 the National Institute on Minority Health and Health Disparities of the National Institutes of Health under Award Number U54MD007582.

MOLECULAR MODELING MECHANISM OF SARS-COV-2 (COVID-19) INTEGRATION IN GASTROINTESTINAL HOST CELLS USING PATIENT GASTRIC DERIVED ORGANOIDS

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Abstract

Host-related genetic factors play an important role in SARS-CoV-2 (referred as COVID-19) mortality. SARS-CoV-2 and its variants has presented an unprecedented impact on human health and civilization. Although vaccination has attenuated the severe symptom of SARS-CoV-2, there is no specific anti-viral medication available for interrogating the viral spreading in gastrointestinal tract. Past studies suggest that human genetic variants are associated with SARS-CoV-2 infection in 13 loci within the human genome to have effect on SARS-CoV-2 susceptibility and severity. However, yet to be fully determined is how spatiotemporal dynamics underlying SARS-CoV-2 interaction with host cell machinery. Several studies demonstrated that gastrointestinal epithelial cells are susceptible to the SARS-CoV-2 infection and first symptom appears within is two weeks before pulmonary infection. This study determined the integration of SARS-CoV-2 into gastrointestinal epithelial cells routing through apical or basolateral membranes by performing microinjection/infection and evaluated the cytokines elicited during gastrointestinal infection using imaging cellular dynamics in gastric patients derived organoids. Results successfully provide proof of principle of organelle communication through apical of parietal membrane in gastric gland and dynamic cytokines triggered by SARS-COV2 infection. Microinjected SARS-CoV-2 elicited a time-dependent stimulation of IL-1Beta secretion from gastric organoids ($p<0.001$; $n=5$). This study has revealed the primary of apical and secondary of basolateral membranes entry of SARS-CoV-2 infection in gastric organoids. Additionally, enteric infection model system established in this study would provide a valuable resource and platform to screen target therapeutics for virus variants infectivity and host susceptibility and profile of cytokines could be targeted therapeutics for precision control of SARS-CoV-2 disease progression.

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

Grant Support: U54MD007602-33S3, S21MD000101, and CA164133

TITLE: EFFECTS OF COVID-19 PANDEMIC ON FOODBORNE ILLNESSES

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Abstract

PURPOSE: New food safety challenges continue to emerge from food production, environmental, and consumers behavior changes. This project aims to determine the impact of the COVID-19 pandemic on food safety and the spread of foodborne diseases. This study aims to assess the trend of foodborne illnesses before and during the

pandemic and determine the relationships between the disease outbreaks and social and demographic factors. METHODS: Data from The Foodborne Diseases Active Surveillance Network (FoodNet) from 2015-20, were collected and analyzed to identify the most frequently reported foodborne diseases; and assess the geographical and demographical differences that contribute to such outbreaks. RESULTS: Results showed a significant geographical variation between the states that report to FoodNet. Salmonella and Campylobacter showed the highest incidence during the reporting period. However, a significant decrease in the rates of major foodborne pathogens was observed during 2020. Results also showed a higher incidence of foodborne diseases among the children under five years of age and the elderly above 65 years. White populations showed a higher incidence of major foodborne illnesses. CONCLUSION: A significant decrease in foodborne illnesses was observed during the pandemic. This decline may result from strict hygienic practices, home cooking, and reduced restaurant dining. Foodborne diseases continue to be a major public health challenge. During the current pandemic, it is critical to understand the correlation between the contributing factors to food safety to manage an already strained health care system effectively.

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 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.

THE COST OF GOOD HEALTH: POVERTY ASSOCIATION WITH DIFFERENTIAL GENE EXPRESSION

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Abstract

PURPOSE Psychosocial factors exert a powerful influence on health and contribute to disparities among marginalized populations. In addition, socioeconomic status (SES) and psychosocial factors may affect gene expression in peripheral blood mononuclear cells, suggesting a molecular mechanism for some health disparities. Here we investigated the effects of poverty among Baltimore City residents participating in the Healthy Aging in Neighborhoods of Diversity across the Life Span (HANDLS). METHODS We examined 239 participants of the HANDLS cohort whose reported household income was either above or below the federal poverty line for 2004. This population sample was 119 African Americans and 120 self-reported white, for 119 men and 120 women. We performed RNA sequencing in peripheral blood mononuclear cells to identify gene expression patterns associated with poverty. RESULTS We found 253 genes differentially expressed between individuals living in poverty and those above the census poverty line. These genes were enriched in response to wounding, regulation of body fluid levels, wound healing, blood coagulation, hemostasis, platelet activation, and homotypic cell-cell adhesion processes. Different sets of genes were associated with poverty in men and women. Differentially expressed genes DEGs in women were enriched in the process of positive regulation of cell activation, while in men were mostly related to the hydrogen peroxide process, cellular detoxification, and neuropeptide signaling pathway. We confirmed sex-specific associations between poverty and gene expression by directly testing for an interaction between sex and poverty status and identified 97 DEGs. CONCLUSIONS Our results contribute to understanding the link between poverty and biological mechanisms of disease. We identified changes in gene expression associated with poverty status, which affect several important biological processes and may contribute to health disparities.

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 work was supported by NIMHD #5U54MD013376-8281 (DD), NIA

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ROLE OF COCAINE ON AMYLOID BETA PEPTIDE AGGREGATION

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Abstract

PURPOSE: Alzheimer's disease is a progressive neurodegenerative disease marked with decreased-cognitive skills and memory loss. This disease is characterized by the accumulation of excessive amyloid beta (Aβ) peptide, which eventually aggregates into neurotoxic plaques in patients. These peptides are derived from the trans-membrane glycoprotein amyloid precursor protein by the cleavage of proteases. As per some estimation, about 2% of people in industrialized countries suffer from this disease. It is possible that people who consume substances of drug abuse are affected by this disease early in their life. Cocaine is one of the most powerful addictive drugs widely abused, mostly in Western countries. Currently, about 3.6 million Americans use this drug on a regular basis. We previously showed that cocaine altered the biochemistry of neurons and contributed in the manifestation of early pathological symptoms in cultured cells. Based on this observation, we speculate that cocaine could enhance the process of beta peptide aggregation. Not many studies reported the relationship between cocaine and beta peptide aggregation under in vitro situation. Attempts are made in this direction currently. METHODS: Citrate phosphate buffer (50 mM), pH 4.93 was used to provide acidic environment for aggregation study in black 96-well culture plates in a final volume of 100 □l per well. Final concentration of Aβ 1–42 peptide, and cocaine was 5 □M and 75 □M, respectively. Congo red (15 □M) was added to the reaction mixture. After 6 days, absorption at 497 was taken. RESULTS: Preliminary data indicated increased peptide aggregation by cocaine. CONCLUSION: Although further confirmation is required, our results appear to point that cocaine enhances Aβ peptide aggregation under in vitro situation.

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

CARDAMONIN NEUROPROTECTIVE EFFECTS IN LPS-ACTIVATED BV-2 MICROGLIAL CELLS

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Abstract

Although Alzheimer's disease is characterized by aggregation and deposition of amyloid-peptides and hyperphosphorylation of tau protein, inflammation and oxidative stress play a critical role in the disease's progression. Activated microglia cells contribute to the production of a variety of neurotoxic substances such as nitric oxide and reactive oxygen species, leading to neurodegeneration. Cardamonin, a bioactive molecule found in many plants, has been shown to have anti-cancer, anti-inflammatory, antioxidant, and antiviral properties. PURPOSE: This study examined the neuroprotective effects of cardamonin on LPS-activated BV-2 microglial cells. METHODS: cell viability, nitric oxide and enzymatic assays for the detection of superoxide dismutase and catalase, quantitative assays for the detection of glutathione levels, and RT-PCR were used. RESULTS: cardamonin induced a dose-response cytotoxic effect on BV-2 microglial cells in concentrations ranging from 0.78 to 200 µM. Concentrations of 6.25 to 50 µM reduced over 95% the release of NO in LPS-activated BV-2 cells, compared to the cells treated with LPS only. Moreover, cardamonin significantly decreased the cellular production of SOD in 3-fold, and increased the levels of expression of CAT (2.5-fold) and glutathione (2-fold). In RT-PCR arrays, cardamonin increased the mRNA

expression of CAT, GSS, and GCLC and decreased the levels of CCL5/RANTES, SLC38a1, and NOS2; all of them involved in oxidative stress process. Moreover, cardamonin increased the expression of Nrf2 and decreased the levels of Keap1, indicating that this may be the signaling involved in the upregulation of antioxidant factors. CONCLUSION: findings reveal that cardamonin is effective in modulating inflammation and oxidative stress-related genes and proteins, indicating that cardamonin could be useful in the treatment of microglia-derived neurodegeneration, slowing or preventing disease progression in the CNS.

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

Grant Support: National Institute on Minority Health and Health Disparities of the National Institutes of Health under Award number U54MD007582.

TARGETING HSPD1 TO DRIVE IMMUNE RESPONSE IN TRIPLE NEGATIVE BREAST CANCER

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Abstract

Immune checkpoint blockade therapies, which act on T cell inhibitory receptors including CTLA-4 and PD-1, induce durable responses across diverse cancers. However, a majority of patients do not respond to these therapies, and initially responsive cancers may relapse. Identifying molecular mechanisms that influence therapeutic response and relapse is critical in order to realize the full therapeutic potential of checkpoint blockade. The presence of an immune response is recognized to be a prognostic factor in breast cancer, specifically in TNBC. The underlying mechanisms driving this response are unclear. In our preliminary studies, we identified Heat shock protein 60 (HSPD1) as a protein expressed in primary breast and metastatic breast cancer. Its high expression correlated with low survival probability in BC. HSPD1 is highly expressed in TNBC breast cancer. Our preliminary data also confirms that HSPD1 expression was higher in TNBC cell lines, MDA-MB-231, MDA-MB-468, HCC1806 as compared to luminal ER+ T47D, BT474 breast cancer cell lines. We characterized 116 TNBC patients from TCGA dataset into HSPD1-high and HSPD1-low category and analyzed top 500 different in HSPD1-high vs HSPD1-low patients and by IPA and GSEA analysis, found that HSPD1 positive tumors harbor signaling pathways associated with cell cycle control of chromosomal replication, cell cycle G2/M damage checkpoint genes, telomerase extension by telomerase, antigen processing. RNA seq analysis of MDA-MB-231 cells silenced for HSPD1 by siRNA showed more than 300 differential regulated genes. GSEA analysis of these genes revealed upregulation of interferon signaling pathway, antigen presentation, DNA damage/telomer stress upon HSPD1 knockdown. Based on these, we hypothesize that HSPD1 plays a role in cell cycle progression and telomer integrity and its inhibition leads to dna damage and upregulation of IFN signaling.

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

Grant Support: 5SC1GM136521-DB, TU RCMI Grant #G12MD007585.

PHOSPHOPROTEOMIC ANALYSIS OF JAK3

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Abstract

JAK3 tyrosine kinase is a critical mediator of immune homeostasis, and response to foreign pathogens. Inhibition of enzymatic activity and loss-of-function mutations within JAK3 results in immunosuppressive phenotypes as it initiates signal transduction for common gamma chain (γc) cytokines Interleukin-2 (IL-2), IL-4, IL-7, IL-9, IL-15 and IL-21. Previously, our group reported that adenylate cyclase/cAMP driven pathways are capable of negatively regulating JAK3 activation via γc cytokines. cAMP signaling most notably occurs through activation of protein kinase A (PKA), which regulates downstream signaling events through serine/threonine (Ser/Thr) phosphorylation. While tyrosine phosphorylation of JAK proteins is well characterized, a role for Ser/Thr is significantly less understood. Because of JAK3's critical role in immune regulation, it is important to fully discern the molecular mechanisms governing this key immune signaling component. METHODS: The human natural killer-like cell line, YT, was treated with 3-isobutyl-1-methylxanthine (IBMX) in combination with forskolin to activate adenylate cyclase and elevate intracellular cAMP production. Total cell lysate from non-treated and treated cells were subjected to phosphoprotein enrichment and the resulting elute was immunoprecipitated for human JAK3 protein, separated by SDS-PAGE, and Western blot analysis. RESULTS/EXPECTED RESULTS: Phospho-(Ser/Thr) PKA substrate antibody detected an inducible JAK3 band (120 kDa) within the IBMX/forskolin treated phosphoprotein elution. A subsequent Western blot confirmed the band to be JAK3. Mass spectrometry analysis is underway to identify specific serine/threonine residues activated in response to hyperactive adenylate cyclase/cAMP signaling. DISCUSSION/CONCLUSION: This study provides evidence for inducible Ser/Thr phosphorylation of JAK3 in human immune cells.

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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STRESS, COPING, AND SLEEP AMONG HBCU COLLEGE STUDENTS

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Abstract

The COVID-19 pandemic is associated with increased reports of stress and sleep disruptions, particularly among young people. College students experience significant stress and differences in coping can exacerbate stress and contribute adversely to behavioral and health outcomes. Stress is strongly linked to the type of coping strategies utilized and demonstrates a significant impact on sleep quality. The goal of this study was to evaluate associations among stress, coping, and sleep quality to determine if the type of coping strategy utilized would moderate the relationship between stress and sleep quality. Results demonstrated that higher levels of stress as well as increased use of emotion-focused coping were associated with poorer sleep quality. Additionally, among students who reported lower levels of stress, problem-focused coping resulted in better sleep quality. This suggests that the type of coping strategies utilized may moderate the relationship between stress and sleep. This is valuable for college students as increased stress and poor sleep quality are related to poor physical and mental health.

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

Grant Support: RCMI Grant U54MD012392

CHARACTERIZATION OF JAK3 SH2 DOMAIN SERINE PHOSPHORYLATION

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Abstract

PURPOSE: Janus Tyrosine Kinase 3 (Jak3) is a key player of common gamma chain (γc) receptor signaling and a Jak family member amongst Jak1, Jak2, and Tyrosine Kinase 2 (Tyk2). Regulation of Jak kinase activity by tyrosine phosphorylation is well established; however, a functional role for serine phosphorylation remains elusive. To remedy this, Jak3 serine phosphorylation was induced by cAMP/PKA agonists along with IL-2 and used to identify phosphoregulatory sites by mass spectrometry. Two novel phosphoserine (pS) sites were identified and found tandemly within the Src Homology 2 (SH2) domain of Jak3, pS448 and pS449. These serine residues are conserved amongst various species as well as amongst Jak family members. METHODS: To establish their role in Jak3 activation and function, site-specific phospho-blocking mutations were created and indicate S449, but not S448, is important for Jak3 auto-activation and downstream Signal Transducer and Activator of Transcription A/B (Stat5A/B) activation. Phosphospecific antibodies were generated against Jak3 pS449 and used to study the activation of this site in response to γc cytokines and various leukemias. RESULTS: This study identified previously unreported SH2 domain pS sites within Jak3, created novel phosphospecific antibodies and determined that IL-2, IL-15 and cAMP/PKA activation induced pS449 is similar to tyrosine phosphorylation dynamics on Jak3. Subsequent kinase inhibitor studies revealed PI3K, downstream of IL-2, may regulate Jak3 S449 phosphorylation. Additionally, Jak3 pS449 was found activated in an Acute Lymphoblastic Leukemia relapse patient. DISCUSSION/CONCLUSION: Together, these results provide the first evidence of Jak3 serine phosphoregulation and its relevance to IL-2 signaling and hematopoietic cancers.

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 by grants from the National Institute on Minority Health and Health Disparities, a component of the National Institutes of Health (5U54MD007592) and from the RISE Scholars Program at UTEP funded by the National Institute of General Medical Sciences (R25GM069621-18).

INVESTIGATING THE ROLE OF HMGA2 ISOFORMS IN HEALTH DISPARITIES

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Abstract

PURPOSE: African American men (AA) suffer disproportionately from prostate cancer (PCa) displaying higher incidence and mortality rates when compared to Caucasian-American men (CA). Recent studies have shown that high mobility group A2 (HMGA2), a non-histone chromatin binding protein, plays a critical role in promoting metastasis. HMGA2 full-length/wild-type and truncated (lacking the 3'UTR) isoforms are overexpressed in several cancers, however, their distinct roles in PCa have not been reported. Literature has previously revealed a splicing factor, CDC-like kinase 3 (CLK3), that splices wild-type HMGA2 to create the truncated HMGA2 isoform. We hypothesize that HMGA2 isoforms may play differential roles to promote PCa progression according to ethnicity. METHODS: qPCR analysis of patient tissue of varying PCa stages was conducted to examine mRNA expression of HMGA2 isoforms and CLK3. RNA-Seq was performed on LNCaP prostate cancer cell lines stably overexpressing wild-type or truncated HMGA2 and compared to Neo control. Reactive oxygen species (ROS) expression was observed in LNCaP prostate cancer cell lines stably overexpressing wild-type or truncated HMGA2. RESULTS: Both wild-type and truncated HMGA2 increased with increased PCa gleason grade. AA when compared to CA, displayed higher levels of truncated HMGA2 and its splicing factor, CLK3. RNA-Seq analysis revealed distinct gene sets regulated by truncated HMGA2 compared to wild-type HMGA2, including upregulation of a distinct set of genes involved in oxidative stress. Additionally, truncated HMGA2 increases oxidative stress in vitro. CONCLUSIONS: These results indicate that HMGA2 isoforms are disproportionately expressed in AA and CA and increase with PCa progression. The regulation of differential genes by HMGA2 isoforms suggest that they may use distinct pathways to promote PCa.

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

LYSOSOME-DEPENDENT REGULATION OF FOXA1 BY SKP2 IN PROSTATE CANCER

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Abstract

Prostate cancer remains one of the most frequently diagnosed malignancies among American males, and one of the leading causes of cancer-associated deaths in the US. Emerging evidence has revealed that patients exposed to androgen deprivation therapy (ADT), the principal treatment targeting androgen receptor (AR), develop resistance to anti-androgens resulting in recurrent PCa growth termed castrate-resistant prostate cancer (CRPC). Despite resistance developing in PCa tumors (~ 30 months post-ADT), identifying the molecular mechanisms driving this process has increasingly become a challenge. Here, we identify a previously uncharacterized regulatory pathway wherein FOXA1 (Forkhead box protein A1), a pioneer transcription factor controlling prostate epithelium reprogram through its interaction with AR, is regulated by SKP2 (S-phase kinase-associated protein 2) in a lysosome-dependent manner. Strikingly, SKP2 knockout (KO) resulted in increased FOXA1 levels in human PCa cells, MEFs and prostate tumors of Pten/Trp53 mice. Whereas, SKP2 overexpression (OE) decreased FOXA1 protein levels though elevated FOXA1 polyubiquitination in PCa cells. More importantly, human PCa tissue microarray (TMA) demonstrated a co-localization between FOXA1 and SKP2 protein while hormone refractory specimens displayed an inverse correlation indicating that SKP2 is able to suppress FOXA1 activity though its ubiquitination function. As changes in FOXA1 levels are associated with PCa progression to CRPC or treatment-emergent neuroendocrine PCa (NEPC), our findings highlight a SKP2 post-translational regulatory mechanism for FOXA1 capable of driving disease severity. Taken together, our results reveal a novel signaling pathway and regulatory role for the SKP2- FOXA1 interplay that may prove to be a promising therapeutic target for PCa.

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

Grant Support: U54MD007586, U54MD007593, U54CA163069, U54CA163066, UL1TR000445-06 and 7K01HL145338

MICROBIOTA OF COLON CANCER PRECURSORS IN HISPANICS AT THE BORDER REGION

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Abstract

PURPOSE. Colorectal cancer (CRC) is a major public health problem in Hispanic men along the U.S.-Mexico border. Environmental factors, such as diet/lifestyle factors, and molecular/genetic influences should be taken into account. The gut microbiota, i.e. the microbial communities inhabiting the human intestine, influences both normal physiology and disease susceptibilities. Microbiota diversity is explained by factors such as age and geography, with individuals from different countries having distinct compositions. Our hypothesis is that alteration of the intestinal microbiota,

could help explain the increased susceptibility of this population to develop CRC. We aim to investigate the relationship between the colon microbiota composition in relationship to the presence and subtype of polyps present throughout the colon. METHODS. Mucosal biopsy samples of colonic lesions will be obtained, and microbiome characterization, through 16S rRNA gene sequencing, as well as whole genome DNA sequencing will be performed. EXPECTED RESULTS. The scientific premise is that the microbiome and cancer-related mutations in polyps are important for the initiation and evolution of CRC. Data generated will help us understand how these microbial-colonic epithelial interactions may play a role on early colonic neoplasia, and demonstrate that mutations present at early stages may be associated with the presence of specific microbial organisms. DISCUSSION. Early identifiable lesions in the colon, have shown significantly greater heterogeneity in their bacterial microbiota profiles compared with normal mucosa. Specific bacterial species are associated with early identifiable lesions present in the colon that may precede the formation and progression of CRC. The long-term goal is to understand the factors that underlie the changes associated with CRC development and progression in order to identify socio-biological markers for the disease that can become targets for prevention and treatment.

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

Grant Support: Border Biomedical Research Center Pilot Grant.

NEUREGULIN-1 SIGNALING IN LUTEAL CELL PHYSIOLOGY

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Abstract

The growth and differentiation of the corpus luteum (CL) are tightly regulated by survival and cell death signals, including LH, intra-ovarian regulators, and cell-cell interactions. CL is a transient ovarian endocrine structure that maintains pregnancy in primates during the first trimester and in rodents during the entire pregnancy by producing steroid hormone progesterone (P4). Neuregulin-1 (NRG1) is a member of the epidermal growth factor-like factor family mediates its effect through the erythroblastoma (ErbB) family. However, the detailed mechanism associated with the interplay of NRG1 signaling in CL function is not known. Therefore, to gain a better understanding of the role of NRG1 signaling in luteal function, we have examined the functional effects of loss-of-function of NRG1 using siRNA (siNRG1) transfection in rat luteal cells (LCs). Twenty- four hours after transfection, cells were treated in the presence or absence of exogenous tumor necrosis factor-α (TNFα, an inflammatory cytokine). In vitro studies revealed that siNRG1 transfected LCs treated with TNFα significantly promoted apoptosis and caspase-3/7 activity in a dose and time-dependent manner when compared to scramble transfected LCs. Under these experimental conditions, mRNA and immunoblot analysis indicated that exogenous TNFα-treatment in siNRG1-transfected cells promoted apoptosis through decreased levels of the pro-survival factors including Bcl2 and Bcl-xl, and increased levels of pro-apoptotic factors including Bax and Bak. Furthermore, under these experimental conditions, the phosphorylation of ErbB2-ErbB3-PI3K-Akt and ErK-signaling pathways is significantly inhibited. Collectively, these studies provide new insights on the NRG1-mediated pro-survival mechanism in LCs through ErbB3-ErbB2-PI3K-Akt/Erk→Bcl2/Bcl-xL pathway and may maintain the function of CL.

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

Grant Support: This study was supported in part by the 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.

MLSYPRED: A NOVEL MALARIA DRUG COMBINATION PREDICTION TOOL

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Center for Collaborative Research in Health Disparities, University of Puerto Rico (ARL, KCC, RAFM, PFG, BGNR); Department of Microbiology and Medical Zoology, University of Puerto Rico, School of Medicine (EECL, AMRQ, MFG, JDR, RGDG, AES)

Abstract

PURPOSE: Malaria is an infectious disease caused by Plasmodium parasites. Drug resistance is a major challenge to control the disease, which is overcome using combinatorial therapies. Computational approaches allow to develop predictive models assessing synergistic combinations. Our aim is to use Machine Learning (ML) algorithms to develop models to predict synergistic antimalarial drug combinations. The hypothesis is that ML algorithms will create models to predict synergism of existing antimalarials. METHODS: A new computational tool, MLSyPred (Machine Learning Synergy Predictor), was developed to incorporate methods for predicting synergistic antimalarial combinations. The tool used compounds SMILES as input followed by Python-based scripts to convert raw data into drug's chemical structure composition (MACCKEYS and Morgan-Fingerprints). The datasets were trained with five ML algorithms (Logistic Regression, Random Forest, Support Vector Machine, Ada Boost, and Gradient Boosting). RESULTS: The MLSyPred tool was tested using a previously published biologically validated dataset of 1,054 antimalarials drug combinations. The five ML algorithms were trained using antimalarial datasets from three Plasmodium falciparum strains (DD2, HB3, and 3D7). The best metric values (AUCROC) for the ML models were computed. Logistic Regression was the most precise model for strains DD2 (AUC=0.81) and HB3 (AUC=0.70), while Random Forest was best suited for strain 3D7 (AUC=0.69). The MLSyPred tool was used to predict synergism of existing antimalarials and a set of novel antiplasmodial leads. The predicted combinations are being tested using the P. berghei in vitro model. DISCUSSION: The MLSyPred allows to develop ML models to predict synergism in combinatorial therapies for malaria. The MLSyPred tool could be used to assist in the initial design of preclinical strategies for combinatorial therapy. GRANT SUPPORT: This work was supported by the NIH-NIMHD grant U54 MD007600.

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

Grant Support: U54 MD007600

CATHEPSIN L INHIBITOR AS A POSSIBLE THERAPY FOR HEPATOCELLULAR CARCINOMA.

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Abstract

PURPOSE: The survival rate of African American men suffering from malignant hepatocellular carcinoma (HCC) is significantly lower than the general population, and there are limited options to treat HCC. The biochemical actions, antiproliferative effects, and drug-likeness of a new Cathepsin L (CatL) inhibitor were investigated in this work. The project's long-term goal is to facilitate the development of the inhibitor or its analogs as new anti-hepatocellular carcinoma agents. METHODS: The cysteine protease CatL is expressed in high quantities in many malignant cancers, including HCC. CatL has been investigated as a diagnostic marker and as a drug target in cancer cells. The antiproliferative activities of the compound were investigated through dose-dependent cell viability and migration assays using Hep G2 and Hep 3B cell lines, while CatL inhibition was studied using recombinant CatL and endogenous CatL in lysates from Hep G2 cells. Preliminary adsorption, metabolism, solubility, and protein binding assays were also carried out. RESULTS / EXPECTED RESULTS: The CatL inhibitor has antiproliferative effects on hepatocarcinoma cells (Hep G2 and Hep 3B) with low micromolar IC50 values, and it can inactivate recombinant

CatL in a time-dependent manner. Furthermore, adequate bidirectional transport across MDR1-MDCKII monolayers was observed with an efflux ratio that shows the inhibitor is not a substrate for the P-glycoprotein efflux pump (P-gp). DISCUSSION / CONCLUSION: These studies showed a relatively high metabolic clearance and plasma protein binding in vitro. On-going studies are focused on preliminary xenograft and pharmacokinetics experiments in addition to medicinal chemistry optimization studies. Overall, the CatL inhibitor is a good candidate for evaluation in murine models of HCC.

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

Grant Support: RCHDR Grant No. 1U54MD015929-01

MIR-125B REGULATES HIV-1 COFACTOR CPSF6

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Abstract

Cleavage and polyadenylation specificity factor 6 (CPSF6) is a cellular protein involved in mRNA processing. Emerging evidence suggests that CPSF6 also plays key roles in HIV-1 infection, specifically during nuclear import and integration targeting. However, the cellular and molecular mechanisms that regulate CPSF6 expression are largely unknown. In this study, we report a post-transcriptional mechanism that regulates CPSF6 via the cellular microRNA miR-125b. An in silico analysis revealed that the 3' untranslated region (3'UTR) of CPSF6 contains a miR-125b-binding site that is conserved across several mammalian species. Since miRNAs repress protein expression, we tested the effects of miR-125b expression on CPSF6 levels in miR-125b knockdown and over-expression experiments, revealing that miR-125b and CPSF6 levels are inversely correlated. To determine whether miR-125b post-transcriptionally regulates CPSF6, we introduced the 3'UTR of CPSF6 mRNA into a luciferase reporter and found that miR-125b negatively regulates CPSF6 3'UTR-driven luciferase activity. Accordingly, mutations in the miR-125b seed sequence abrogated the regulatory effect of the miRNA on the CPSF6 3'UTR. Finally, pull-down experiments demonstrated that miR-125b physically interacts with CPSF6 3'UTR. Interestingly, HIV-1 infection down-regulated miR-125b expression concurrent with up-regulation of CPSF6. Notably, miR-125b down-regulation in infected cells was not due to reduced pri-miRNA or pre-miRNA levels. However, miR-125b down-regulation depended on HIV-1 reverse transcription but not viral DNA integration. These findings establish a post-transcriptional mechanism that controls CPSF6 expression and highlight a novel function of miR-125b during HIV-host interaction.

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

Grant Support: U54MD007586

HIV ASSOCIATED PATHOLOGY OF THE DOPAMINERGIC SYSTEM IN THE HIV-1 TRANSGENIC RAT.

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Abstract

PURPOSE: Even with treatment, HIV reservoirs continue to produce low levels of HIV or HIV proteins (GP-120, TAT and Nef). As a result, symptoms emerge which are known as HIV noninfectious comorbidities (HNC). HNC are a notable challenge to HIV health care. HIV-associated neurocognitive disorders (HAND) are a problematic HNC with a number of difficult to treat symptoms. One cluster of symptom is Parkinson-like and can occur without any other cause but HIV infection of the brain. There are severe changes to the dopaminergic system requiring treatment of the Parkinson symptoms but treatment options are problematic. Symptomatic treatment may work in the short term but it has been reported to increase the severity of the viral infection. Moreover, use of antipsychotics for the treatment of associated cognitive symptoms can lead to increased severity of the motor problems. This creates a dilemma for the treatment of this HNC. In order to discover new treatment strategies, we are examining the alterations of the Dopaminergic system of the HIV-1 TG rat, a well-established model for HIV disease. We are looking at markers for increased senescence, Free radical stress and break down of the Blood brain barrier (BBB). METHODS: HIV transgenic rat brains were examined for signs of neuropathology in the Substantia Nigra and caudate/ putamen. The immunocytochemical stains used were: Anti- IgG for BBB permeability, Senescence Associated Beta-Gal (BG) enzyme for premature senescence, and GFAP for reactive gliosis. RESULTS: Throughout the caudate-putamen there was evidence of BBB increase permeability with similar finding in the substantia N. Neurons in these areas showing evident of BG staining. DISCUSSION/ CONCLUSION: The complex nature of this HNC require new strategies for treatment development. Clarification of the neuropathophysiology found in this animal model may eventually provide new options for testing neuroprotective medications.

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

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B CELLS AS MODULATORS OF HPV+ OROPHARYNGEAL TUMOR DEVELOPMENT

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Abstract

PURPOSE. Hispanics with HNSCC induced by the human papillomavirus (HPV) have one of the worst survival rates compared to other racial groups. Programmed Death-1 (PD-1) blockade has been FDA approved to treat HNSCC, however, only ~30% of patients respond. Among the different immune cells present within tumors, B cells also infiltrate HPV+ HNSCC and different B cell subsets may exert opposite functions in tumor development. Therefore, fine regulation of anti-tumor and tumor-promoting B cell subsets is necessary to promote an effective anti-tumor response and therefore prevent tumor progression. Whether B cells modulate tumor development and response to PD-1 blockade in HPV+ oropharyngeal cancer is unclear. METHODS. By using the preclinical mouse model for HPV+ oropharyngeal cancer (named mEER), we have determined that tongue-implanted tumors are sensitive to anti-PD-1, where around 50% of the mice clear the tumors, whereas flank-implanted tumors are completely resistant to these treatments. By using this in vivo model, we characterized B cells within tumors and during anti-PD-1 therapy by flow cytometry and tumor growth in B cell-deficient mice. RESULTS. We determined that tongue-implanted tumors (sensitive) contained high infiltration of CD8+ T cells and low infiltration of B cells whereas flank-implanted tumors contained (resistant) high frequency of B cells compared to T cells. Also, B cell-deficient mice showed a slower tumor growth rate and longer survival compared to wild-type mice. In addition, when we compared tongue tumor-bearing mice treated with anti-PD-1, we observed that tumors that responded to the therapy contained more T cells and B cells than the ones that did not respond. CONCLUSION. Our data suggest that B cells may contribute to

tumor development and that PD-1 blockade may switch the function of B cells. Identification of B cell subsets within tumors may predict responsiveness to PD-1 blockade in Hispanic cancer patients.

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

Grant Support: NIMHD-NIH 5U54MD007600 RCMI Pilot

DEVELOP A LC-MS METHOD TO QUANTIFY MULTIPLE SEGMENTS OF CARBOHYDRATE ANTIGEN 125 (CA125) FOR OVARIAN CANCER DIAGNOSIS

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Abstract

Purpose: Carbohydrate Antigen 125 (CA125), also called Cancer Antigen 125 or Tumor Antigen 125, is a mucin-type membrane glycoprotein that can be used for diagnosis of ovarian lesions. Currently, several biological methods (e.g., ELISA) using antibodies have been developed for CA125 relative quantification. However, the specificity and accuracy of these methods are not enough for ovarian cancer diagnosis accurately, probably due to less identification specificity and less quantification accuracy. This study aims to develop a LC-MS method using MRM approach to absolutely quantify different segment of CA125 to improve specificity and accuracy. Method: Surrogate peptides of human CA125 were designed and synthesized for human CA125 protein. A Sciex 6500 Triple Q LC-MS/MS system was used to quantify the surrogate peptides. Human high CA125 producing ovarian cancer cell line OVCAR3 and low CA125 producing cell line A072 were used to quantify CA125 protein from cell culture medium. Different de-glycosylation approaches were tested to improve digestion efficiency Results: Thirteen peptides were designed for N-terminal, SEA, Tender Repeat, and C-terminal of human CA125. A sensitive and robust LC-MS method using MRM approach were established to quantify these 13 peptides simultaneously. The results showed that in the cell culture medium of OVCAR3 cells, three peptides were quantified with different culture duration. Conclusion: A robust LC-MS method that can quantify multiple segments of CA125 was established and expected to have a better specificity and accuracy for CA125 quantification for ovarian cancer diagnosis.

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 Cancer Prevention Research Institute of Texas (CPRIT, RP190672) and National Institute of General Medical Sciences (1R15GM126475-01A1) for Song Gao. This work was also made possible, in part, by services provided from GCC Center for Comprehensive PK/PD and Formulation (CCPF) with CPRIT grant number of RP180748 and National Institute of Minority Health and Health Disparity (U54MD007605). The OVCAR3 and A0728 cells are gifts from Dr. Robert Bast at MD Anderson Cancer Center.

COMPARING MEDICAL GROUP VS INDIVIDUALIZED DIETITAN-LED VISITS AS A WAY TO APPROACH THE OBESITY EPIDEMIC IN AN INNER-CITY SETTING

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Abstract

PURPOSE Obesity is highly prevalent in the U.S., particularly among ethnic minority groups. The Los Angeles County Department of Health Services (LACDHS) treats over 600,000 mostly indigent, minority patients annually of

whom 200,000 are obese, with obesity-related diseases. Due to the patient volume, innovative/high-volume/high-quality/sustainable programs are needed to address the obesity epidemic. Medical group visits have been used to treat chronic diseases but their efficacy in obesity has not been well studied, especially compared to individualized dietitian-led visits (standard of care) in safety-net settings. The purpose was to compare the two approaches in a randomized trial of 12-months duration. METHODS 167 adults ages 22-73 (88.4% female; 60.5% Hispanic; 34.9% non-Hispanic Blacks) were recruited from LACDHS and randomized in a 3:1 ratio to medical group (n=124) and dietitian-led visits (n=43). We analyzed data for the changes from baseline in the weight, BMI, HbA1c, total cholesterol, HDL, triglyceride and food intake for the total sample and between groups using Wilcoxon Signed Rank or median Tests and repeated measure analysis of variance respectively. RESULTS For the total sample (n=167), there were significant changes in the weight, BMI, HbA1c, total cholesterol, HDL, triglyceride levels, energy, protein, and fat intakes ($p<0.05$). Medical group had significant lower number of visits and improvement in total cholesterol, LDL, HbA1c compared to the dietitian group ($p<0.05$) but no difference in the median change in BMI or weight. The median weight loss for dietitian group was 6.6 pounds (IQR=10.9) and 7.5 pounds (IQR=19.8) for medical group. DISCUSSION Results show no significant difference between the groups in the change in weight. The medical group had significant improvement in the lipid profile and HbA1c levels compared to the dietitian-led group. The improvements in the medical group are more impressive since they occurred at less number of visits.

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

Grant Support: NIH Accelerating Excellence in Translational Science (AXIS) Award # U54MD007598

FACTORS AFFECTING DECISIONS ABOUT PROSTATE CANCER SCREENING

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Abstract

PURPOSE: Considering the higher rates of prostate cancer in African American men (AAM), and guidelines recommending shared-decision-making (SDM) regarding prostate-specific-antigen (PSA)-based screening, the aim of this study is to assess main factors influencing AAM's decisions about PSA-screening. METHODS: Prospective study of AAM patients (40-69 years old) randomly assigned to an intervention (SDM-aid) or control (usual-care). Surveys were conducted at baseline, medical-encounter, and follow-up. Descriptive statistics include frequencies, means, and distributions. ANOVAS tested for differences in change in knowledge and satisfaction between patients in the intervention and control groups. RESULTS: Most of patients (n=89) were 50-69 years old (77%) and had health insurance (92%). While 13% had less than high school, 31% had high school diploma, and 56% some type of advanced education. More than half of participants (53%) reported have never had a PSA-screening, 50% correctly identified that a PSA-screening is a blood-test, and 93% said they would get a PSA-screening, if offered. In general, there was an increase in scores from baseline to follow-up. Intervention group had significantly higher change in pre-post-test scores in knowledge of prostate cancer and PSA screening ($p<0.05$) and satisfaction with PSA decision ($p=0.03$). During the medical encounter, patients (n=62), evaluated the application of the SDM process as "good" for the clinicians (M= 22.0, range 0-32) and themselves (M= 8.3, range 0-12). Additionally, patients completing the intervention (n=39) rated the SDM-aid as "very useful" (M=18.1, range 5-20). DISCUSSION / CONCLUSION: Results show that the content in the SDM-aid is addressing issues relevant to the patients' needs, especially knowledge about prostate cancer, which is a pre-requisite to foster informed decision making about PSA, and satisfaction when making these decisions. As this study is still under way, results presented are preliminary

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

EXAMINING SCHOOL WELLNESS IN AMERICAN INDIAN COMMUNITIES

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Abstract

PURPOSE: The purpose of this pilot study was to examine the quality and prevalence of wellness policies and practices related to student nutrition, physical activity and other wellness activities in elementary (K-8) schools on/near the Navajo Nation. Some research suggests strong school wellness policies (SWPs) can improve school nutrition and physical activity practices in schools; yet it is unclear how and what role SWPs shape school contexts and health promoting behaviors in students. Methods: This was a mixed methods study conducted with a convenience sample of 5 elementary schools during school year 2020-2021. The quality of written school policies was assessed (strength and comprehensiveness) using an existing tool. Principals completed a 61-item school wellness practices survey. Semi-structured interviews were conducted with key stakeholders (N=20; 4 from each school) to understand day-to-day wellness practices implemented in schools. Results: While written SWPs addressed required topic areas (comprehensiveness score: 61), some policies were underdeveloped and not clearly written (strength score: 39). Certain practices such as offering free school meals, scheduling recess before lunch, and offering physical education for students were positive findings. However, other practices such as not engaging students in school meal related decisions, teachers offering candy as reward and allowing students to voluntarily skip recess for other activities were areas needing improvement. Further, schools did not have an active wellness policy team to ensure policy implementation. Conclusion: Schools on the Navajo Nation need support in strengthening wellness policy language and implementing strong policies. An approach involving students, families, and community to assist with school wellness efforts is needed. Such efforts can be important to identifying culturally based strategies for promoting more opportunities for healthy eating and physical activity in schools.

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

Grant Support: NIH/NIMHD RCMI U54MD012388

GENOMIC COMPARISON BETWEEN AFRICAN AMERICAN MEN & EUROPEAN AMERICAN MEN WITH PROSTATE CANCER

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Abstract

Compared to European American men (EAM), African American men (AAM) have 2-3 times higher prostate cancer (PCa) mortality rates. Studies suggested that tumor biology & cellular heterogeneity/gene profile, have potential contributions to racial differences, which remain even when controlled for access to care and stage at presentation. Moreover, men of African ancestry from the Caribbean & South America experience incidence & mortality rates similar to AAM, suggesting a possible ancestral basis for some of these expected outcomes. Here we hypothesize that African ancestry drives aggressive prostate cancer and leads to genetic alterations with upregulation of unique Immune-inflammatory signature in AAM of African descent. To assess our hypothesis, we performed genome-wide sequencing (WES & RNA Seq), for a total of (n= 72) patients obtained from treatment-naive PCa who self-reported their race. Out of those 72 samples, 47 samples RNA Seq match with WES. To verify the self-reported race, we used ADMIXTURE to generate a quantitative estimate of each individual ancestral composition. Most of our cohorts who self-reported as AAM, their ancestry assigned to African Ancestry (Ancestry proportion > 70%) with either Bantu

subpopulation in Sub-Saharan area and/or Yoruba (Nigeria) subpopulation. Our results showed that AAM are diagnosed with PCa at a younger age and higher pathology stage. Moreover, DGEs analyses revealed that gene sets such as activation of the innate immune as well as interleukin signaling, are positively enriched (p-value 0.05), while gene sets such as RNA Polymerase II transcription and metabolisms signaling are negatively enriched (p-value 0.05) in AAM. Our WES analysis showed that patients with high African Ancestry associated with AR-related mutation such asFOXA1, PTEN, TP53, EPHB2 with SPOP mutation (18% in AAM vs 8% in EAM) on top of these mutations.

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

Grant Support: DoD-award #W81XWH-18-1-0588, U54-MD007585-26 NIH/NIMHD (to C.C.Y.) and U54-CA118623 (NIH/NCI) (to C.C.Y.)

HESPERETIN MOLECULAR MECHANISMS ON LPS-ACTIVATED BV-2 MICROGLIAL CELLS

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Abstract

Neurodegenerative disorders are becoming more prevalent as life expectancy increases. Among several triggers, neuroinflammation and oxidative stress play a key role in the progression of the disease. PURPOSE: this study evaluated the effect of hesperetin (HST), a major flavonoid found in citrus fruits, on LPS-activated BV-2 microglial cells. METHODS: cytotoxicity assays, RT-PCR using specific primers for Nrf2 and PD-L1, PCR arrays to screen a range of genes associated with oxidative stress, enzymatic assays for catalase (CAT) and superoxide dismutase (SOD) detection, and a quantitative assay to measure glutathione expression were used. RESULTS: cell viability results showed that HST was not toxic in concentrations ranging from 0.78 to 100 µM, however the concentration of 200 µM decreased 20% the cell viability after 24 h. In the combination of HST and LPS only the concentration of 200 µM reduced 50% cell viability after 24 h. The RT-PCR results showed that HST downregulated PD-L1 mRNA expression in more than 50% in the LPS-activated cells and induced Nrf2 mRNA expression, which is involved in the transcription of several antioxidant genes. The oxidative stress PCR arrays showed that 100 µM of HST modulated numerous genes that regulate oxidative stress and inflammatory processes. HST down-regulated mRNA expression of ERCC6, SQSTM1, NOS2, and NCF1, and up-regulated the expression of HMOX1, which participate in excessive oxidative stress processes and exacerbated inflammatory states. Both CAT and SOD enzymatic assays showed that treatment with HST induced CAT and SOD expression after a 48-h treatment, compared to LPS treatment. The same effect was obtained in the glutathione quantitative assays, showing that HST induced the expression of glutathione on LPS-activated BV-2 cells. CONCLUSION: Hesperetin modulates several genes associated with oxidative stress and neuroinflammation and may potentially prevent or slow the progression of neurodegeneration.

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 of the NIH U54 MD007582.

NEW SIGMA-2 RECEPTOR LIGANDS (□2RL) FOR CANCER THERAPY

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Abstract

PURPOSE: Triple-negative breast cancer (TNBC) is one of the most malignant cancers with a high rate of mortality in the US and especially in African American women. Recent reports indicate that ligands that activate (Agonists) the overexpressed Sigma-2 Receptors (σ2R) in proliferating tumor cells can lead to the death of the tumor cells through apoptotic and non-apoptotic mechanisms and also can suppress tumor progression. Although there is currently no clinically used anticancer drug that targets σ1 or σ2 receptors, a growing body of evidence supports the potential of σ2R ligands such as Siramesine (currently in clinical trials) with an affinity for these receptors as therapeutic agents to treat cancer. Herein we report the synthesis of a new compound (2-(2-(4-(3,4-Dihydroisoquinolin-2(1H)-yl) piperidin-1-yl) ethyl)-5-fluoro-2-methyl-2,3-dihydro-1H-inden-1-one) (1) exhibiting nM scale σ2R activity which can act as a potential anticancer agent. METHOD: The synthesis of (1) involves a multistep process, and the final step involves reacting 5-Chloro-2-(2-chloroethyl)-2-methyl-2,3-dihydro-1H-inden-1-one with 2-(piperidin-4-yl)-1,2,3,4-tetrahydroisoquinoline in dry acetonitrile using potassium carbonate as the base to obtain the desired compound (1) in moderate to good yields. The compound was then converted to HCl salt for binding and cancer activity evaluation. The compound thus prepared was then evaluated for their cytotoxic effects on MBA-MB-231, MBA-MB-468, MCF-10A cell lines. RESULTS: The synthesized compound (1) showed moderate anticancer activity, and a chiral resolution of (1) to separate the enantiomers and test for activity was undertaken. CONCLUSION: Anticancer activity of the separated enantiomers of (1) and structure-activity relationship (SAR) studies based on the lead compound (1), including molecular modeling studies, are underway to improve the anticancer activity and develop a profile based on compound (1).

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 NIMHD RCMI award number U54 MD007582

SUBSTITUTED CHROMONE-2-CARBOXAMIDE AS ANTI-BREAST CANCER AGENTS

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Abstract

PURPOSE: Cancer is the second leading cause of death in the United States after heart disease. In 2022, the American Cancer Society (ACS) reported that there would be a total of 1.9 million new cancer cases, and 609,360 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 are 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 activities with low toxicity. In continuation of our current research work, we report the synthesis of substituted chromone-2-carboxamides 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-aminoisoquinoline or N-aminopyridine in dry THF presence of triethylamine, and refluxed at 70 oC and led to the formation of the ylides. Reduction of the ylides with sodium borohydride produced 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-dihydroisoquinoline-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. Further structure-activity relationship (SAR) studies, including molecular modeling techniques, are underway 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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METFORMIN INHIBITS TNBC CELLS BY DOWNREGULATING C-MET

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Abstract

PURPOSE: Triple negative breast cancer (TNBC) is the most refractory subtype to treatment, underscoring the need to identify novel targets and treatments to improve prognosis. The anti-diabetic drug Metformin is emerging as a promising anti-cancer agent. Although metformin induced-signaling in AMPK/mTOR and other pathways have been identified, the mechanisms underlying its anti-cancer function in TNBC have yet to be fully elucidated. We aimed to identify novel mediators of metformin-induced inhibition of TNBC cells. METHODS: MDA-MB-468 TNBC cells were treated with metformin. Drug induced effects on proliferation and signaling were assessed with CCK8, clonogenic, Western blotting and PCR assays. Control and c-Met overexpressing sublines were established with lentivirus mediated expression. The sublines were treated with metformin, followed by analysis for proliferation, signal transduction and stemness. RESULTS: Our results demonstrated greater sensitivity of MDA-MB-468 cells to Metformin compared to other breast cancer cell lines. Metformin-induced inhibition of MDA-MB-468 cell proliferation was correlated with the downregulation of c-Met at both protein and mRNA levels. Overexpression of c-Met in MDA-MB-468 cells rendered resistance to Metformin, accompanied by the promotion of cancer cell stemness. Functionally, we demonstrated that c-Met induced activation of receptor tyrosine kinase (RTK) signaling pathways play a critical role in c-Met-modulated Metformin responsiveness. DISCUSSION: Our work demonstrated the role c-Met downregulation in Metformin-associated anti-cancer activities. The novel findings from this project highlight c-Met as a key regulator of Metformin-mediated inhibition of TNBC cell growth, suggesting that c-Met overexpression may be a critical factor of metformin resistance. To this end, combination of Metformin with c-Met inhibitors could be a useful strategy to improve Metformin-mediated anti-cancer efficacies in 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 RCMI U54 (1U54MD012392) and National Institutes of Health F31 Ruth L. Kirschstein Predoctoral Individual National Research Service Award (5F31CA239507-02).

CHARACTERIZATION OF STOOL METABOLITES IN PUERTO RICAN HISPANICS

Dr. Maria Gonzalez-Pons - Other
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Abstract

Purpose: Colorectal cancer (CRC) is the 1st and 2nd leading cause of cancer death in men and women in Puerto Rico and the U.S., respectively. Hispanics in Puerto Rico have worse CRC survival than other racial/ethnic groups. Inflammation and the gut microbiota are considered major contributors to colorectal carcinogenesis; however, currently CRC screening is the only means of prevention. The main goal of this study was to identify metabolites in stool associated with colorectal adenomas, colorectal pre-cancerous lesions, in Puerto Rican Hispanics. Methods: Using a case-control study design (control n=24; adenomas=17), metabolites were extracted from stool samples and analyzed via gas chromatography/mass spectrometry the GCMS/MS-TQ8050 triple quadrupole (Shimadzu Inc). Metabolomic analysis was performed using Metaboanalist v.5.0. Results/expected results: Our preliminary analysis

show that the main metabolite classes detected in stool samples from our cohort of Hispanics in Puerto Rico (n=41) were fatty acids (32.73%), amino acids (25.45%). sterols (5.45%), and purines (5.45%). When comparing metabolite profiles between controls and adenomas according to sex, our results show two clusters corresponding to controls and adenomas. Differential concentrations of cholesterol, adipate, and amino acids are likely to be factors that discriminate between cases and controls in this preliminary analysis. However, differences in the concentrations of metabolites did not reach statistical significance. Discussion/conclusion: Analysis of a larger number of samples is warranted and currently underway. We will also perform 16s bacterial community profiling in order to perform integration analysis. The examination of the association between modifiable (e.g. gut bacterial community profiles and metabolites) risk factors and colorectal adenomas will serve as a foundation for future studies focused on developing CRC risk stratification and/or prevention approaches.

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

Grant Support: This project is supported by RCMI grant U54 MD007600 (National Institute on Minority Health and Health Disparities) from the National Institutes of Health.

DISCRIMINATORY IN VITRO DISSOLUTION FOR PLGA NANOPARTICLES

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Abstract

INTRODUCTION Dissolution testing is an invaluable tool to test the performance and stability of different drug formulations. Dissolution study is particularly important for low solubility drugs, where absorption is dissolution-rate limited. However, choice of dissolution medium is very crucial for the development of a robust and discriminatory dissolution method. Dissolution medium must provide sink conditions (volume of dissolution medium at least three to ten times the saturation volume). Absence of sink conditions may cause unpredictable release kinetics and suppressed release profiles. PURPOSE In this study the influence of medium pH and surfactant type on the sink conditions and dissolution behavior is presented. It is expected that based on dose size/solubility ratio a discriminatory and meaningful dissolution test method can be established. METHODS Closed-loop type USP apparatus 4 was used to test in vitro release from PLGA nanoparticles. Synthetic compound AC1LPSZG (mTORC1/2 inhibitor) was used as a model poorly soluble. Drug solubility and stability were tested in five different buffers at pH 1.2, 4.5, 5.5, 6.8 and 7.4. Three different surfactants: SLS (Sodium Lauryl Sulfate-anionic), Tween 80 (non-ionic) and CTAB (Cetyltrimethylammonium bromide- cationic) were tested. RESULTS The drug solubility was pH dependent, maximum solubility observed at pH 1.2 for basic drug. The order of solubility enhancement using surfactants was SLS > Tween80 > CTAB. The dissolution efficiency was improved with the increase of surfactant concentration. The established dissolution method was able to discriminate between various release profiles. CONCLUSION Developed discriminatory in vitro dissolution test method can be used as a quality control tool to identify critical formulation and process parameters, to ensure batch-to-batch uniformity and can also be used as a surrogate for bioequivalence studies if a predictive IVIVC (In vitro In vivo correlation) is obtained.

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

Grant Support: GRANT SUPPORT This study was funded by NIH/NIMHD-Research Centers in Minority Institutions Program (U54MD007605) and Cancer Prevention & Research Institute of Texas (CPRIT) Core Facilities Support Awards (RP180748).

AN INVESTIGATION OF HMGA2; THE EXPRESSION PROFILE IN PROSTATE CANCER TISSUE AND SERUM FROM MEN OF AFRICAN DESCENT

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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, respectively. The heritability rate of prostate cancer is 58%. African American men have the highest incidence and mortality rate of prostate cancer compared to other races. Men of African descent, globally, are more likely to die from prostate cancer than any other ancestral groups. METHODS: We isolated RNA and performed RNA seq analysis from African American tissue and serum samples (normal and tumor), with a focus on HMGA2, which has been shown to be overexpressed in prostate cancer. RESULTS: Our results showed, in a sample set of 3 benign and 2 prostate cancer tumors, HMGA2 to be down-regulated; however, HMGA2 transcripts were not detected in serum. The most differentially expressed gene found in tumor tissue was SNORD166-118, which was down-regulated compared to benign tumor tissue. CONCLUSIONS: These results indicate that HMGA2 although reported to be up-regulated in prostate cancer is actually down-regulated in the African American tumor tissue examined. A larger sample set will have to be performed in more tissue samples.

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

CANNABINOID RECEPTOR-MEDIATED SYNAPTIC SIGNALING AND NEURAL PLASTICITY IN CENTRAL OLFACTORY NEURONS

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Abstract

The endocannabinoid (eCB) signaling system has been functionally implicated 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 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 (Depolarization-Induced Suppression of Inhibition, DSI). We study the function of the eCB system in regulating neural activity at synapses in the main olfactory bulb (MOB), the first central relay station in the brain for the processing of olfactory information. Our experimental approach uses electrophysiological recording techniques (whole cell patch-clamp recordings). Previously, we showed that CB1R is present in periglomerular processes of a GAD65-positive population of interneurons but not in mitral cells, key MOB output neurons. We detected eCBs in the mouse MOB as well as the expression of CB1R and other genes associated with the cannabinoid signaling system. Output neurons such as mitral cells and tufted cells in the MOB are computational elements that integrate incoming signals with membrane properties to generate behaviorally relevant synaptic output. Our data support the notion that retrograde signaling is present in neural circuits involving mitral and tufted cells. Mitral and tufted cells release eCBs and, through retrograde signaling, inhibit presynaptic interneurons such as periglomerular cells, which controls the 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. ECBs

function as retrograde messengers to regulate neural signaling and mediate plasticity at MOB 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: NSF (IOS-1355034), NIH (P30AI117970), Howard University College of Medicine

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LAB COAT BLUES: WORKPLACE BULLYING AND POTENTIAL SUBSTANCE ABUSE FOR UNDERREPRESENTED WOMEN MEDICAL SCHOOL FACULTY

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Morgan State University

Abstract

PURPOSE: Empirical studies confirm that women and people of color are more likely to face workplace bullying. Workplace bullying leads to professional burnout, negative work culture, substance abuse, lack of career satisfaction, and career interruption. This study examines the relationship between stressful workplace bullying and possible substance use as coping mechanisms for underrepresented (URM) women medical school faculty. METHODS: The research collected data from 120 underrepresented medical school women faculty in April 2021 using an online instrument sent directly to their respective emails. We used multiple regression to address the central research question, which is ""what is the relationship between workplace bullying, stress, and self-medicating substance use for URM women medical school faculty."" The hypothesis is that there is a direct relationship between bullying-related stress and self-medicating substance use among URM women medical school faculty. RESULTS: Respondents were asked to answer 5-point Likert scale questions for both independent variables. The significant regression equation is ($F(2, 126) = 4.664$. $p < 0.011$ with an $R2$ of .069. Respondents predicted the intensity of workplace bullying (DV1) is equal to 4.553 + .295 (stress, IV2) where knowledge is measured through the 5-point Likert scale questions. In this analysis, the intensity of workplace bullying (DV1) increased .295 for each unit of one on a 1–5 Likert scale. Of the two independent variables in the regression, only stress statistically impacted URM women faculty. The second independent variable of substance use revealed a slightly positive relationship, but nothing significant. CONCLUSIONS: Research confirms the prevalence and potential impact of workplace bullying on URM women in academic medicine. Unfortunately, the prevalence of workplace bullying in academic medicine confirmed the added health-harming stress that URM women face.

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

Grant Support: U54MD013376

PRE-EXISTING INTERSECTIONS: BLACK WOMEN, HEALTH ISSUES, WORKPLACE BULLYING

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Abstract

PURPOSE: Researchers have linked chronic stress to chronic health problems. Specifically, Kreiger's Ecosocial Theory posits that hostile and discriminatory environments are directly linked to health issues in the Black community. Further, studies have shown that analogous discriminatory behaviors and workplace bullying behaviors hurt those subjected to this abuse. METHODS: To address these phenomena for Black women in higher education, I use a multiple regression with the respondent's age as the dependent variable and health issues and coping strategies

as the two independent variables to answer the question. RQ1 What is the relationship between the age of the faculty female target and health issues and the resulting coping behaviors in the context of workplace bullying? RESULTS: The results confirmed a direct and statistically significant between the age of the Black woman respondent and health problems. However, there is a slightly inverse relationship between the respondent's age and coping strategies. In short, though age is related to stress and health issues because of bullying; older women use few coping mechanisms to deal with workplace bullying. See attached tables. CONCLUSIONS: While workplace bullying can affect any employee, research shows that Black women disproportionately suffer because of bullies and, therefore more susceptible to health problems associated with this emotional and psychological work violence.

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

Grant Support: U54MD013376

THE STUDY OF MOUSE HIPPOCAMPAL METABOLITES BY 1H-MRS

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Abstract

Introduction The study of cerebral metabolites relies heavily on detection methods and sample preparation1. Proton magnetic resonance spectroscopy (1H-MRS) is a noninvasive method commonly used to reveal metabolic profiles in both clinical and preclinical studies. However, animal experiments in vivo require anesthetic agents that can alter brain metabolism, whereas ex vivo experiments demand appropriate fixation methods to preserve the tissue from rapid postmortem degradation. In this study, the metabolic profiles of mouse hippocampi using 1H-MRS were compared in vivo and in situ with or without focused beam microwave irradiation (FBMI) fixation. Materials and Methods C57BL/6 mice were randomly assigned to three groups, in vivo, FBMI fixation and no fixation group. The in vivo studies were acquired under isoflurane anesthesia while in situ brain rapidly decapitated without or with FBMI fixation. All in vivo and in situ 1H-MRS experiments were performed on a 9.4T Bruker NMR spectrometer and brain metabolites were analyzed using LCModel2. Results After FBMI fixation, the concentrations of Lac, tCho, and mIns were comparable to those obtained in vivo under isoflurane, whereas other metabolites were significantly lower. Except for a decrease in NAA and an increase in Tau, all other metabolites remain stable over 41 hours in FBMI fixed brains. Without FBMI, the concentrations of mIns (before 2 hours), tCho, and GABA were close to that of in vivo. However, higher Lac, and lower NAA, Gln, Glu, GSH, tCr, and Tau was observed. NAA, Gln, Glu, GSH, tCr, and Tau exhibited good temporal stability for at least 20 hours in the unfixed brain, whereas a linear increase of tCho, mIns, and GABA were observed. Discussion and Conclusion In summary, our results indicate that a proper fixation method is required for in situ detection depending on the targeted metabolites of specific interests in the brain.

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

Grant Support: NIMHD 5U54MD007597-33

ANTI-METASTATIC MECHANISM EXPLORATION: TREATMENT OF HUMAN BREAST CANCER CELLS WITH SMR PEPTIDE

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Abstract

PURPOSE: Our group discovered and developed a novel anti-cancer SMR peptide that antagonizes breast cancer cell exosome release resulting in cell cycle arrest and tumor growth suppression. This study aims to evaluate the anti-metastatic capabilities of the SMR peptide, focusing on exosomes and EMT. METHODS: Breast cancer cell lines MDA-MB-231 and MCF-7 were treated with the SMRwt peptide, and the following assays were performed: cell wound-healing, migration, invasion. Western blot analysis detected epithelial and mesenchymal markers to evaluate EMT progression. Extracellular vesicle type and quantity were assessed through NanoSight analysis. Mortalin and Vimentin knockdown was achieved through antibody targeting and siRNAs. RESULTS: Data gathered demonstrated that the SMR peptide interacts with Mortalin and Vimentin to inhibit pro-EMT exosome release and induce EMT tumor suppressor protein expression. Specifically, SMRwt treatment reduced mesenchymal markers Mortalin and Vimentin expression, while the epithelial marker E-cadherin expression was increased in breast cancer cells and breast cancer derived exosomes. The SMR peptide specificity was identified as no effect was observed for MCF-10A exosome release or function. Direct Mortalin knockdown paralleled the results of SMR peptide treatment with an effective blockade of breast cancer cell migration. Conversely, the invasion assay differed between breast cancer cell lines with invasion blocked in MCF-7 but not MDA-MB-231. CONCLUSIONS: These results reinforce the therapeutic value of targeting breast cancer exosome release and reinforce Mortalin and Vimentin as critical regulators and therapeutic targets in breast cancer cell progression, EMT, and metastatic potential. A greater understanding of the SMR peptide mechanism of action will benefit the therapeutic design of anti-metastatic agents.

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 the NIH/NIMHD 8G12MD007602 and NIH/NIMHD 8U54MD007588.

THE DESIGN AND DEVELOPMENT OF GMC1 ANALOGUES: TARGETING THE REGULATION OF FKBP52 AND HORMONAL RECEPTORS IN PROSTATE CANCER CELLS

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Abstract

Prostate cancer (PC) is a proliferative disorder characterized by abnormal cell growth that originates in the prostate gland. An effective way of treating PC is androgen deprivation therapy (ADT). However, at an advance stage, PC stops to respond to ADT, and this is referred to as castrate-resistant prostate cancer (CRPC). 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 necessary to design and develop new pharmacophores/analogues with suitable water solubility, liquid stability, and therapeutically potent against PC. 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. 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. In vitro evaluation of the antiproliferation and inhibitory potentials of identified compounds against PC and its associated proteins in treating CRPC is ongoing.

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

Grant Support: RP180748, U54MD007605

BE FLEXIBLE: THE RECRUITMENT MANTRA OF THE COVID PANDEMIC

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Abstract

PURPOSE The purpose of this abstract is to present the reflections on the recruitment of Native Hawaiian (NH) infant-mother dyads for a 1-year prospective cohort study during the COVID-19 pandemic. METHODS The study originally propsed to recruit and enroll a convenience sample of 125 NH women who were pregnant in their third trimest or had just given birth through island-wide community events and recruitment at the Kapi‘olani Medical Center for Women and Children (KAP), the busiest labor and delivery unit in the state of Hawai‘i. Recruitment began in the spring of 2020 and was expected to take about 1 year. RESULTS / EXPECTED RESULTS Recruitment was delayed by 1 year as a result of the COVID-19 pandemic. Recruitment protocols were revised to minimize person to person contact through remote recruitment (e.g., rather than approach patients in-person, they were contacted by phone). We also developed a social media recruitment plan in lieu of community events which were canceled. IRB priority was given to COVID related projects so a considerable amount of time was needed for IRB revision. Recruitment through social media has been unsuccessful with most subjects enrolled via phone. To date, after 16 month of recruitment, 91 dyads have enrolled in the study with 3 completed. DISCUSSION / CONCLUSION Researchers learned flexibility is important to conducting research during a pandemic. Being able to transition from face to face to phone recruitment was critical to recruitment efforts. Previously successful recruitment events (e.g. community events), even those that transitioned to being delivered online, were no longer viable options. Social media platforms such as Instagram and Facebook required a high frequency of posts but yielded little interest. The vulnerability of the population recruited for the study (pregnant mothers and infants) may have also influenced hesitancy to participate in research.

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

Grant Support: This project was supported by grant number U54MD007601 from the National Institute on Minority Health and Health Disparities (NIMHD), a component of the National Institutes of Health (NIH) and its contents are solely the responsibility of the author and do not necessarily represent the official view of NIMHD or NIH.

CANNABIDIOL LOADED EXTRACELLULAR VESICLES FROM HUMAN UMBILICAL CORD MESENCHYMAL STEM CELLS ALLEVIATE PACLITAXEL INDUCED PERIPHERAL NEUROPATHY

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Abstract

PURPOSE: Chronic paclitaxel (PTX) treatment causes excruciating pain in cancer patients, limiting its use in cancer chemotherapy. Herein, the neuroprotective potential of synthetic cannabidiol (CBD) and CBD formulated in extracellular vesicles (CBD-EVs) isolated from human umbilical cord derived mesenchymal stem cells were studied against PTX-induced neuropathic pain (PIPN) in C57BL/6J mice METHODS: PTX (8 mg/kg, i.p,) was injected every other day (four doses) to induce neuropathy in C57BL/6J mice. CBD and CBD-EVs was administered (5 mg/kg, i.p) for 6 weeks with twice a week frequency. At the end of the study, the behavior of the animals towards pain perception

were measured using Hargreaves plantar apparatus, hot and cold tail immersion test, vonfrey aesthesiometer and randalsellito apparatus. Dorsal root ganglions (DRGs) were isolated from animals for molecular studies. Further, in-vitro studies were conducted in DRG primary cultures to study the mitochondrial effects of CBD and CBD-EVs against PTX insult. RESULTS: EVs and CBD-EVs particle size, surface roughness, nanomechanical attributes, stability, and release studies were investigated. CBD-EVs treatment significantly improved mechanical and thermal hypersensitivity ($P<0.001$) as compared to EVs or CBD alone. PTX-treated mice's dorsal root ganglions and spinal homogenates had mitochondrial dysfunction which was significantly improved by CBD and CBD-EVs by regulating the AMPK pathway ($P<0.001$). Blocking studies with 5HT1A receptors and AMPK demonstrated that CBD had no effect on PIPN neurobehavioral or mitochondrial function. CONCLUSION: Our results suggest that CBD-EVs can be a novel therapeutic option for the treatment of PIPN and CBD treatment activates the AMPK axis in regulating PIPN.

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

Grant Support: Authors would like to acknowledge Consortium for Medical Marijuana Clinical Outcomes Research, Grant/Award number: SUB00002097, National Institute on Minority Health and Health Disparities of National Institutes of Health, Grant/Award Number: U54 MD007582 and NSF-CREST Center for Complex Materials Design for Multidimensional Additive Processing (CoManD), Grant/Award Number:1735968

ROLE OF CANNABIDIOL AND TETRAHYDROCANNABIVARIN ON PACLITAXEL-INDUCED NEUROPATHIC PAIN IN RODENTS

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Abstract

PURPOSE: The purpose of this study was to evaluate if phytocannabinoids, synthetic cannabidiol (CBD), and tetrahydrocannabivarin (THCV), and their combination, could protect mice from Paclitaxel-induced peripheral neuropathy (PIPN). METHODS: Six groups of C57BL/6J mice (n = 6) were used in this study. The mice were given paclitaxel (PTX) (8 mg/kg/day, i.p.) on days 1, 3, 5, and 7 to induce neuropathy. Mice were evaluated for behavioral parameters, and dorsal root ganglions (DRG) were collected from the animals and subjected to RNA sequence and westernblot analysis at the end of the study. On cultured DRGs derived from adult male rats, immunocytochemistry and mitochondrial functional assays were also performed. RESULTS: When compared to individual treatments, the combination of CBD and THCV improved thermal and mechanical neurobehavioral symptoms in mice by twofold. Targets for CBD and THCV therapy were identified by KEGG (RNA sequencing). PTX reduced the expression of p-AMPK, SIRT1, NRF2, HO1, SOD2, and catalase while increasing the expression of PI3K, p-AKT, p-P38 MAP kinase, BAX, TGF-β, NLRP3 inflammasome, and caspase 3 in DRG homogenates of mice. Combination therapy outperformed monotherapy in reversing these protein expressions. To reduce mitochondrial superoxides, CBD and THCV were added to DRG primary cultures. WAY100135 and rimonabant altered the neuroprotective effects of CBD and THCV respectively by blocking 5-HT1A and CB1 receptors in mice and DRG primary cultures. CONCLUSION: Our results suggest that the entourage effect of CBD and THCV against PIPN appears to protect neurons in mice via 5HT1A and CB1 receptors respectively.

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

Grant Support: Authors would like to acknowledge Consortium for Medical Marijuana Clinical Outcomes Research, Grant/Award number: SUB00002097, National Institute on Minority Health and Health Disparities of National Institutes of Health, Grant/Award Number: U54 MD007582 and NSF-CREST Center for Complex Materials Design for Multidimensional Additive Processing (CoManD), Grant/Award Number:1735968

TRANSCRIPTOMIC ANALYSIS UNRAVEL NOVEL MOLECULAR TARGETS FOR CANNABIDIOL AND TETRAHYDROCANNABIVARIN IN ATTENUATING EXPERIMENTAL PERIPHERAL DIABETIC NEUROPATHY

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Abstract

PURPOSE: To identify the transcriptomic signatures of Cannabidiol (CBD) and tetrahydrocannabivarin (THCV) in Streptozotocin induced experimental diabetic neuropathy (DN) METHODS: Animals were rendered diabetic using STZ (55 mg/kg, i.p). CBD was administered (10 & 20 mg/kg, i.p) and THCV (15 & 30 mg/kg, i.p) during the last 4 weeks of 12 week diabetic period. The animals' pain perception was assessed using the Hargreaves plantar test, hot and cold plate method, vonfrey aesthesiometer, and Randal Sellito apparatus, and nerve functional assessment using the Laser Doppler oxymeter. After the study, the animals' blood was drawn to measure blood glucose levels and their DRGs were isolated for transcriptomic studies. RESULTS: Diabetic animals after eight weeks significantly ($P<0.001$) increased hypersensitivity to thermal and mechanical pain and also significantly ($p<0.001$) reduced nerve blood flow when compared to the age matched control animals. CBD and THCV treatment reversed these effects in a dose-dependent manner while having no effect on the animals' body weights or blood glucose levels. Differently expressed genes (transcriptomic analysis) have been discovered in the isolated DRGs of control, diabetic, and treated animals, with 32 genes in the control group, 33 in the THCV group, and 45 in the CBD group, all of which differ from the genes expressed in diabetic animals' DRGs. These genes regulating nerve function by affecting the RAP1 signaling pathway, MAP kinase signaling pathway, neurotrophin signaling pathway, Parkinson's disease, Alzheimer's disease, focal adhesion, insulin signaling pathway, microRNAs in cancer, and others according to KEGG analysis. Conclusion: Despite the fact that CBD and THCV are non-psychoactive medical marijuana components, they differ in their ability to regulate different genes that contribute to the health of neurons in diabetic condition.

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

Grant Support: Authors would like to acknowledge Consortium for Medical Marijuana Clinical Outcomes Research, Grant/Award number: SUB00002097, National Institute on Minority Health and Health Disparities of National Institutes of Health, Grant/Award Number: U54 MD007582 and NSF-CREST Center for Complex Materials Design for Multidimensional Additive Processing (CoManD), Grant/Award Number:1735968

CLONING OF METHIONINE AMINOPEPTIDASE 1A FROM MYCOBACTERIUM TUBERCULOSIS

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Abstract

PURPOSE: The emergence of multidrug-resistant and extensively drug-resistant Tuberculosis (TB) has led to the urgent need for new drugs with novel mechanisms of action against TB. Therefore, our studies have focused on developing novel anti-TB agents targeting an important class of enzymes: Methionine aminopeptidases (MetAP). MetAP is a dinuclear metalloprotein required for bacterial growth and survival. It is responsible for the excision of the initiating N-terminal methionine after protein translation. MetAP is an essential enzyme and, therefore, a promising target for the discovery and development of new anti-TB agents. Here, we report the sub-cloning of MetAP1a from Mycobacterium tuberculosis (Mtb). METHODS: Briefly, forward and reverse primers encoding the MtMetAP1a sequence were designed, and polymerase chain reaction (PCR) was utilized to amplify the MetAP1a gene from the genomic DNA of Mtb. The purified PCR product & pET303/CT-His vector was digested using XbaI & XhoI restriction enzymes. Fragments were isolated by 1% agarose gel. The ligation of MtMetAP1a into the pET303/CT-His

vector was performed at 16°C overnight with T4 DNA ligase. The recombinant plasmid was then transformed by heat shock into DH5α E. Coli cells. The plasmid containing MtMetAP1a was extracted using a miniprep kit. RESULTS: We successfully cloned the MtMetAP1a gene into pET303/CT-His vector. The sequence of MtMetAP1a was verified to ensure the presence of a wild-type sequence without any mutations. Future studies include overexpression, purification, and characterization of MtMetAP1a protein against MetAP1a inhibitors. CONCLUSION: The clinical significance of this study is that the discovery of new compounds with a novel mechanism of action may lead to the development of new antitubercular drug candidates for the treatment of drug-sensitive and drug-resistant TB.

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.

HUR UBIQUITINATION BY BRCA1 AFFECTS RNA METABOLISM IN BC

Dr. Frida Esther Kleiman - Other
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Abstract

PURPOSE: BRCA1 associated with BARD1 has E3 ubiquitin (Ub) ligase activity, but their targets and the implication of this enzymatic activity in breast cancer (BC) are not fully understood. Here we explore the possibility that human antigen R (HuR), a major RNA binding protein that regulates its target mRNAs posttranscriptionally by binding to and stabilizing its targets, might be a substrate of BRCA1/BARD1. HuR ubiquitination signals its dissociation from target mRNAs, resulting in mRNA destabilization under non-stress conditions. METHODS: In vitro and ex vivo ubiquitination and RNA immunoprecipitation assays were used in this study. RESULTS/EXPECTED RESULTS: Our data indicates that HuR undergoes non-degradative di-ubiquitination by BRCA1/BARD1 resulting in the modulation of it intracellular localization and interaction with target mRNAs involved in DDR, such as TP53. This process is affected in triple negative BC cells expressing non-functional BRCA1/BARD1. DISCUSSION/CONCLUSION: Our data suggest that HuR ubiquitination by BRCA1/BARD1 causes translocation of HuR from the nucleus to the cytoplasm and decreases HuR binding to its target mRNAs under non-stress conditions. As clinical studies reveal that high levels of cytoplasmic HuR are correlated with more aggressive forms of BC, these studies reveal a new paradigm in the role of BRCA1-mediated ubiquitination in controlling gene expression and in BC.

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

Grant Support: none

POLYISOPRENYLATED CYSTEINYL AMIDE INHIBITORS DEPLETE SINGLY POLYISOPRENYLATED MONOMERIC G-PROTEINS IN LUNG AND BREAST CANCER CELL LINES

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Abstract

PURPOSE Finding effective therapies against cancers driven by mutant and/or overexpressed hyperactive G-proteins remains an area of active research. Polyisoprenylated cysteinyl amide inhibitors (PCAIs) such as NSL-YHJ-2-27 and NSL-YHJ-2-62 are potential anticancer agents that mimic the essential posttranslational modifications of G-proteins. Here, we determined the effect of the PCAIs on the levels of RAS and monomeric G-proteins. METHODS Four cell lines, A549, NCI-H1299, MDA-MB-231, and MDA-MB-468, were used to determine the effects of the PCAIs on the levels of G-proteins. Wound healing and cell invasion assays were conducted to determine the effect of the PCAIs on cell migration and invasion, respectively. Western blotting was used to determine the levels of adhesion and cell motility proteins, vinculin and fascin in A549 cells. RESULTS Results showed significant decreases in KRAS, RhoA, Rac1, and Cdc42 levels ranging between 20-66% in cells treated with NSL-YHJ-2-27. However, no significant differences were observed on the levels of the doubly geranylgeranylated Rab5A G-protein. Interestingly, 38 and 44% decreases in the levels of the farnesylated and acylated NRAS were observed in the two breast cancer cell lines, MDA-MB-231, and MDA-MB-468, respectively, while HRAS levels decreased by 36% only in MDA-MB-468 cells. NSL-YHJ-2-27 inhibited the migration and invasion of A549 cells by 72 and 70 %, respectively, while suppressing vinculin and fascin levels by 33 and 43%, respectively. CONCLUSION The ability of the PCAIs to affect significant monomeric G-proteins indicate their potency as anticancer agents. More importantly, it was also observed that PCAIs impede cell invasion and migration, implying their potential at inhibiting metastasis. Agents such as the PCAIs that counteract the hyperactivities of G-proteins are well sought after due the devastating and aggressive nature of cancers driven by such G-proteins and the considerable dearth of therapies targeting them.

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

Grant Support: NIH/NIMHHD/U54MD007582;NIH/NCI U54CA233396, U54CA233444,U54CA233465

TREATMENT OF AROMATASE INHIBITOR-RESISTANT CELLS WITH POLYISOPRENYLATED CYSTEINYL AMIDE INHIBITORS STIMULATES THE MITOGEN-ACTIVATED PROTEIN KINASE PATHWAY ENZYMES

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Abstract

PURPOSE Overexpression and hyperactivity of the estrogen receptor drives 67-80% and 90% of breast cancer in women and men, respectively. Resistance to aromatase inhibitor (AI) therapies necessitates the continuous search for novel therapies. Previous studies demonstrate AI-resistance is associated with hormone-independence, enhanced motility, and increased growth factor signaling. METHODS Here, long-term letrozole-treated cells (LTLT-Ca) were used to evaluate polyisoprenylated cysteinyl amide inhibitors (PCAIs) as potential alternative therapies for the treatment of aromatase inhibitor-resistant breast cancer. We determined the potency of PCAIs as anticancer agents by evaluating their effects on cell viability, MAPK pathway enzymes phosphorylation, G-proteins levels, and wound healing assay to determine their effects on cell migration. RESULTS Among the PCAIs tested, NSL-YHJ-2-27 showed significant potency against cell viability with an EC50 of 3.6 µM. MEK (p-MEK1/2), ERK (p-ERK1/2), and p90RSK (p-p90RSK) phosphorylation were significantly increased by 178, 119 and 125%, respectively, over controls. In addition, of the seven G-proteins evaluated, only KRAS and NRAS showed significant increases of 46 and 88 %, respectively. Migration of the LTLT-Ca cells was inhibited by 80% following treatment with 5 µM of NSL-YHJ-2.27. CONCLUSION Our findings suggest that PCAIs suppression of cell viability and activation of the MAPK pathway causes apoptosis possibly through the activation of the proapoptotic p-p90RSK isoforms. These findings also support a potential role for PCAIs' use in treating breast cancers that have become resistant to aromatase inhibitor therapies.

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

Grant Support: NIH/NIMHHD/U54MD007582

EXPLORING THE LINK BETWEEN COVID-19 AND GUT MICROBIOME – A STUDY OF THE TSU COMMUNITY

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Abstract

PURPOSE Monitoring SARS-CoV-2 virus through wastewater has been adopted as an effective surveillance approach of COVID-19 pandemic. This study innovatively examined the longitudinal dynamics of COVID-19 and microbiome across various sewage samples representing diverse demographic populations in Houston. METHODS We collected wastewater through manholes and the viral RNA levels of SARS-CoV-2 were monitored from December 2020 to present. The sampling sites serve the greater Third Ward area and Texas Southern University campus, as well as nursing homes, rehabs, and shelters across the metro Houston area, respectively. The viral load was analyzed by the gold standard RT-qPCR method, and the microbiome load and composition by qPCR and amplicon sequencing of the 16S and ITS DNA. RESULTS / EXPECTED RESULTS Preliminary results on the dynamics of SARS-CoV-2 viral load indicated diverse trends among sampling sites. These viral trends could be classified into three basic categories: flat, up and down, and up, suggesting disparities in COVID-19 infections among communities. The analysis of microbiome is underway, but a preview of the data revealed that bacteria and fungi commonly seen in the human gut predominated the wastewater samples. This paves the way to exploring the link between COVID-19 and the gut microbiome, which could shed light on the observed COVID-19 disparities. DISCUSSION / CONCLUSION As a proof-of-concept, our sewage bio-monitoring program was able to capture COVID-19 viral, bacterial, and fungal signals longitudinally from manholes serving a wide range of communities. Because these signals are predominantly human-associated, further analysis of these signals could offer insight on COVID-19 related disparities among these communities.

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

Grant Support: NIH FUND # U54MD007605

THE MECHANISTIC ROLE OF KDM5B IN NEUROENDOCRINE PROSTATE CANCER

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Abstract

Prostate cancer (PCa) remains as the most commonly diagnosed malignancy in African American men. Androgen deprivation therapy (ADT) is the standard therapeutic intervention for locally advanced and metastatic PCa. Although ADT is initially effective for most cases, patients develop to castration-resistant prostate cancer (CRPC) and a subset of them differentiate to neuroendocrine PCa (NEPC). Therefore, there is an urgent and unmet need to understand the molecular mechanism on NEPC. Lysine (K)-specific demethylase 5B (KDM5B) is frequently elevated in various human cancers, including advanced PCa, CRPC and NEPC. Sex-determining region Y [SRY]-box transcription factor 9 (SOX9) plays a crucial role in prostate development and has been suggested to drive prostate carcinogenesis. Here, we investigated the functional role of KDM5B-SOX9 signaling pathways in NEPC differentiation and progression. Strikingly, KDM5B ablation in PC3 cells decreased the mRNA and protein levels of SOX9 and neuroendocrine (NE) markers (Chromogranin A, Enolase 2 and Synaptophysin). By contrast, KDM5B addback in PC3 KDM5B knockout

(KO) cells restored the levels of SOX9 and NE markers. More importantly, our results also revealed that levels of NE markers, along with Kdm5b and Sox9, were increased in recurrent tumors of castrated Pten/Trp53 mice as compared with regressive tumors, suggesting that KDM5B upregulation was associated with NEPC malignancy in mouse models. Furthermore, MDV3100 treatment resulted in the NEPC differentiation in LNCaP cells. In addition, KDM5B-SOX9 signaling was hyper-activated and NE markers were significantly increased in MDV3100-treated LNCaP cells as compared to the control cells. These findings reveal that KDM5B/SOX9 acts as a key effector on the development of progression of NEPC malignancy, and further support that targeting KDM5B/SOX9 can be a novel and effective therapeutic strategy of 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-DICRIDGT

MACROPHAGE CYTOKINE SPP1 INCREASES GROWTH OF PROSTATE INTRAEPITHELIAL NEOPLASIA TO PROMOTE PROSTATE TUMOR PROGRESSION

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Abstract

PURPOSE: Prostate cancer development and progression are associated with increased infiltrating macrophages. Prostate cancer is derived from prostatic intraepithelial neoplasia (PIN) lesions. However, the effects macrophages have on PIN progression remain unclear. This study is to dissect the role of macrophages in PIN. METHODS: We utilized a 3D co-culture to assess the effect of macrophages in PIN cell growth. Moreover, we applied gene arrays to identify potential macrophage-secreted factors that promote PIN cell proliferation. In addition, we also carried out immunoblotting technique in our in vitro system and verified these findings in human tissue samples by immunohistochemistry. RESULTS: We showed that the recruited macrophages adjacent to PIN expressed M2 macrophage markers. In addition, high levels of Spp1 transcripts, also known as osteopontin, were identified in these macrophages. Extraneously added Spp1 accelerated PIN cell proliferation through activation of Akt and JNK in a 3D culture setting. We also showed that PIN cells expressed several Spp1 receptors including CD44 and integrins. Finally, blockade of Akt and JNK activation through their specific inhibitor completely abolished macrophage Spp1-induced cell proliferation of PIN. CONCLUSION: Our data revealed Spp1 as another macrophage cytokine/growth factor as well as its-mediated mechanism to upregulate PIN cell growth, thus promoting prostate cancer development. It is known that African Americans not only are prone to prostate cancer as compared to other racial groups, but also have a worse outcome from prostate cancer. Results from this current study and its following studies could aid a deeper understanding on prostate cancer progression which will identify new strategies to reduce prostate cancer death especially from this racial group.

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

Grant Support: This research work was supported by NIH/NIMHD Grant U54MD007590 as the pilot project in the Investigator Development Core (to G-YL) and its Research Infrastructure Core. CJB was supported by NIH/NIGMS RISE Grant R25G06414.

EXPLORING HISPANIC YOUNG MEN'S PERCEPTIONS ON HPV AND THE HPV VACCINE

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Abstract

PURPOSE: The human papillomavirus (HPV) is the most common sexually transmitted infection in the United States (US). HPV has been associated with cervical cancer in females and oropharyngeal cancer in males. Although the HPV vaccine can prevent 70% of all OPCs, HPV vaccination rates among males remains significantly low at 7%. The purpose of this study was to explore Hispanic young male's perceptions on HPV, HPV vaccine uptake, and HPV cancer prevention. METHODS: A qualitative descriptive research approach was used to analyze data from three group interviews. Data were collected from young adult Hispanic males (N = 13, ages 18-35). Semi-structured focus group interviews were conducted in a virtual platform, audio-recorded, and transcribed verbatim. Data were analyzed using content analysis. RESULTS: The study identified several factors which contribute to HPV and HPV associated cancer disparities. For example, there was a significant lack of health literacy as it relates to HPV, HPV related cancers, and HPV prevention mitigation measures (to include the HPV vaccine). Traditional Hispanic cultural values, including masculinity, were revealed as barriers to HPV health literacy, HPV screening, and HPV associated cancer screenings. Participants discussed increasing HPV awareness and health literacy through policy advocacy and community outreach through key community stakeholders, as well as facilitators that would increase accessibility to HPV related services. DISCUSSION: As Hispanics continue to experience a high burden of HPV, it is important to understand factors that may impede prevention mitigation efforts. The expansion of age and gender requirements to increase HPV vaccine uptake has created new opportunities to target high risk communities. This study provides useful contributions which should be considered and integrated to future endeavors aiming to mitigate disparities associated with HPV.

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 Grant 2U54MD007592 and Grant 3U54MD007592-28S3 from the National Institutes on Minority Health and Health Disparities (NIMHD), a division of the National Institutes of Health (NIH).

METABOLIC DYSFUNCTION IN LATINX WITH DEPRESSION/ANXIETY

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Abstract

PURPOSE: Severe mental illness has been associated with a higher risk of developing cardiovascular (CVD) disease and risk of mortality from CVD. Thyroid dysfunction may be a risk factor for CVD, within the euthyroid range and mental health may be impacted. The aim of this study was to examine the associations between cardiometabolic risk factors and thyroid function using thyroid stimulating hormone (TSH) among Latinx patients diagnosed with depression and/or anxiety receiving care at a community clinic. METHODS: A needs assessments was completed using a random sample of 100 de-identified medical records of euthyroid Latinx patients seeking mental health care at Caridad Center in Boynton Beach, Fl. Demographics, diagnoses, laboratory tests results and the Protocol for Responding to and Assessing Patients' Assets, Risks, and Experiences (PRAPARE) questionnaire data were abstracted. The cut-off point for high TSH was ≥2mU/L and low TSH as <2mU/L. RESULTS/EXPECTED RESULTS: The mean age was 51.9±11.8 years and 82.8% were female. Out of the 100 individuals, 43% were diagnosed with depression, 38% with anxiety and 17% with both depression and anxiety. Over 75% were within 100% of the federal poverty level (FPL). Almost half (48%) of the sample had 3 or more cardiovascular risk factors. Those with low TSH had significantly higher mean fasting glucose (194.0±86.2 mg/dL vs.140.6±52.8 mg/dL, p=0.0046), mean hemoglobin A1c (9.6±2.8% vs. 7.5±1.5%, p=0.018), mean total cholesterol (200.5±32.8 mg/dL vs. 171.5±39.7 mg/dL, p=0.034) compared to those with high TSH. DISCUSSION/CONCLUSION: In Latinx euthyroid patients with a diagnosis of depression and/or anxiety, a relationship between low-normal TSH levels and factors

associated with CVD was demonstrated. Understanding how thyroid hormone levels can influence metabolic factors that influence chronic disease risk among patients experiencing multimorbidity may help address health disparities suffered in disadvantaged populations.

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

Grant Support: FIU RCMI Community Research Enhancement Grant (CREG)

CARDAMONIN EFFECT ON PD-L1 AND NRF2 EXPRESSION IN TNBC CELLS

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Abstract

Triple-negative breast cancer (TNBC) represents 15 % to 20 % of all breast cancer cases. Unlike other forms of breast cancer, TNBC does not express estrogen, progesterone, or HER2 receptors, and is one of the most challenging malignancies to treat. Cancer cells employ mechanisms to escape immune system, such as upregulation of expression of PD-L1, a ligand encoded by the CD274 gene. Cancer cells also up-regulate expression of NRF2, a transcription factor that positively regulates the promotion of metastasis and evasion of cell death, leading to chemoresistance. Therefore, therapies that modulate PD-L1 and NRF2 expression may be helpful. For years, chemotherapy has been the main treatment option for TNBC, but recently flavonoids, polyphenols found abundantly in fruits and vegetables, have been reported as potential anti-cancer compounds. Cardamonin, an aromatic enone within the flavonoid family, has been described as having numerous pharmacological activities. PURPOSE: this work investigates the ability of cardamonin in modulating PD-L1 and NRF2 expression in MDA-MB-231 (Caucasian) and MDA-MB-468 (African American) TNBC cell lines, which are genetically distinct. METHODS: cytotoxicity assays, human ELISA, and RT-PCR assays were performed. RESULTS: cardamonin treatment caused a dose-dependent decrease on cell viability in both cell lines in concentrations ranging from 3.12 µM to 200µM. Although IFN-γ-stimulated MDA-231 cells presented a higher expression of PD-L1 compared to MDA-MB-468, cardamonin modulated PD-L1 expression in both cells lines. Cardamonin also had an effect on HO-1 mRNA expression, which is a gene transcribed in result of NRF2 activation. CONCLUSION: The data show that cardamonin may be able to alter the production of PD-L1, NRF2, and genes transcribed by NRF2 activation, indicating that it may have a potential to decrease the levels of PD-L1 and NRF2 in the tumor microenvironment combating the cancer cells' effectiveness of evading the immune system.

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 U54 MD007582.

ANTICANCER EFFECTS OF SANGUINARINE IN TRIPLE-NEGATIVE BREAST CANCER CELLS VIA APOPTOSIS INDUCTION AND CELL CYCLE ARREST

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Abstract

PURPOSE The development of novel therapeutic agents that are safer and more effective for enhancing the outcomes of chemotherapeutic agents is needed. The natural alkaloid sanguinarine (SANG) has demonstrated synergistic therapeutic effects combined with various chemotherapeutic drugs. METHODS In this study, we investigated the

molecular mechanism underlying SANG activity in MDA-MB-231 and MDA-MB-468 cells as two genetically different models of TNBC. We measured the effect of SANG on cell viability, proliferation rate, and colony formation. Also, the apoptotic effect of SANG and the cell distribution across the cell cycle were evaluated. qRT-PCR using human apoptosis array was performed to profile the mRNA expression of different genes mediating the apoptotic pathway in each cell line. RESULTS SANG decreased the viability of both cell lines, but MDA-MB-468 cells were more sensitive to SANG than MDA-MB-231 cells. SANG delayed colony formation and affected cell cycle progression in both cell lines. SANG-treated TNBC cells showed significantly upregulated mRNA expression of 18 genes associated with apoptosis, including members of different families such as the TNF receptor superfamily, BCL2 family, caspase family in MDA-MB-468 cells; in MDA-MB-231 cells, two members of the TNF superfamily and four members of the BCL2 family were affected. CONCLUSION These results indicate that SANG shows markedly different anticancer effects and apoptosis-related gene expression changes in the two cell lines. Thus, SANG demonstrates potent anticancer effects in TNBC cell lines, suggesting its potential as a single or adjunct therapeutic agent against TNBC.

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

Grant Support: GRANT SUPPORT This research was funded by NIH grants from NIMHD, RCMI grant U54 MD007582.

ZAR1L MEDIATED STRESS TOLERANCE AND DRUG RESISTANCE IN BREAST CANCER

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Abstract

PURPOSE: Breast cancer (BC) is second leading cause of cancer-related death among women, BC has highest mortality rate among African America/Black women compared to other races. Drug resistance and metastasis are some of the main obstacles halting the effectiveness of current treatments, leading to a higher death toll every year. Exposure to stress, like ionizing radiations, drugs, oxidative stress, etc the cells can reprogram the RNA turnover using the ribonucleoproteins (RNPs) like stress granules (SG) and P-bodies, leading to development of resistance to treatment. Zygote arrest 1 like (ZAR1L) is a novel RNA-binding, C4 zinc finger-containing protein that exhibits differential cellular localization between the nucleus and cytoplasm. ZAR1L has a relatively higher expression in the tumor tissues compared to the normal breast tissues. ZAR1L has been shown to compartmentalize in RNA-processing bodies. Thus we hypothesize that upregulation of ZAR1L in BC upon exposure to the DNA damaging agents is in part associated with development of resistance. METHODS To address our hypothesis we treated the BC cells with Cisplatin, Lapatinib, Doxorubicin, Hydrogen peroxide and monitored the levels and localization of stress markers and ZAR1L using qRT-PCR, western blotting and immunofluorescence. RESULTS: We observed ZAR1L level was upregulated upon exposure of the BC cells to different stress inducing agents. We also observed a co-localization of ZAR1L and G3BP1 (a hallmark of SGs) in the cytosol. CONCLUSION: our observations suggest a close and possible direct relationship between ZAR1L and SGs levels in BC. Interfering with stress-induced proteins, like ZAR1L, to reduce SGs formation can be a potential strategy for new co-adjuvant therapies in breast cancer.

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

Grant Support: NIH grant 1U54RR026140, 2U54MDOO7586-32

PHOSPHOTYROSINE-ΓC FACILITATES CRKL-IL2 SIGNALING CASCADE

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Abstract

Immune cell activation and cellular expansion is crucial for the elimination of foreign pathogens, but, if unregulated can lead to allergic diseases, autoimmune disorders and cancer. The Crk adaptor protein CT10 Avian Sarcoma Virus regulator of kinase like protein, CrkL, is among key cellular regulators involved in processes such as cell migration, cell cycle progression and apoptosis. Recently, our group showed that CrkL is a regulator of Interleukin-2 (IL-2) cytokine signaling critical for T-cell activation. To better understand the association between CrkL and the IL-2 signaling cascade, we created phospho-deletion mutations of key tyrosine residues within the common gamma chain (γc). METHODS: Wild-type CrkL proteins were co-expressed along with a reconstituted IL-2 receptor pathway in a Hek293 system consisting of Jak1, Jak3 and either wild-type γc or γc containing phosphotyrosine-deletion mutations. RESULTS: While WT γc protein was found to co-immunoprecipitate with CrkL in both Kit225 cells and reconstituted HEK293 cells, phospho-deletion mutations of γc tyrosine residues did not. This data suggests that tyrosine phosphorylation of γc is important in CrkL-γc association. Importantly, specific tyrosine residues within γc needed for complex formation have been identified. DISCUSSION/CONCLUSION: Understanding the complexity of how T-cell signaling networks form allows for the development of improved pharmacological drugs to treat severe immune disorders. This study identifies γc tyrosine residues involved in the direct association with the adaptor protein CrkL and connects these crucial signaling players of the IL-2 receptor pathway. It is envisioned that the area of interaction between CrkL and γc may serve as a novel target for diseases driven by constitutively active γc cytokine signaling.

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 grants from the National Institute on Minority Health and Health Disparities, a component of the National Institutes of Health (5U54MD007592) and from the RISE Scholars Program at UTEP funded by the National Institute of General Medical Sciences (R25GM069621-18).

NEUROBEHAVIORAL GENE EXPRESSION IN T2DM AFRICAN AMERICANS

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Abstract

PURPOSE Neurobehavioral disease and disorders in Type 2 Diabetes (T2DM) patients are a growing concern with increased prevalence in the west and among the African Americans (AA) in the USA. However, relationships of neurobehavioral disorders and T2DM in gene expression level have been established, but the possible associations with gender and with lifestyle factors, e.g., tobacco, smoking, and alcohol consumption were not evaluated earlier. METHODS Six genes (APBA1, APBB2, APOC1, APOE, GSK3B, and NAE1) were considered from our prior studies and publicly available datasets. Relative gene expressions (TaqMan Low Density Array based qRT-PCR) were performed in the T2DM group (n=59) compared with non-diabetes (n=9) from AA residents of the Washington DC area. Median expression level of all genes of non-diabetes group was used to analyze and compare the gene expressions (up or downregulated) with diabetes. Mann-Whitney U test was applied for statistical analysis. RESULTS Overall, a significant difference in relative gene expression was observed with APBA1 (p-value<0.0001) in diabetes compared to non-diabetes. APBA1, APOE were downregulated in more than 80% of diabetes participants. Downregulation of APOC1 (p-value 0.0120), GSK3B (p-value 0.0263) and NAE1 (p-value 0.0256) were positively associated with the level of HbA1c of individuals. Significant differences in relative gene expression were observed with the APBB2 (p-value 0.0017) in the diabetes smokers compared to the diabetes non-smokers. We also observed that APBA1 (p-value 0.0435) and GSK3B (p-value 0.0485) were significantly downregulated in females than in males. DISCUSSION Results suggest that gender, smoking habits, and the lack of control of HbA1c level are directly associated with differential expression of neurobehavioral disorder linked genes in AA participants with T2DM. The

results have implications for improving the clinical management of T2DM in the AA community that ignites more translation research.

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

Grant Support: U54 (MD007597-31-5959) from NIMHD, USA)

DEEP LEARNING ALGORITHM MAY EXPLAIN LUNG CANCER DISPARITY

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Abstract

PURPOSE: Lung cancer incidence and mortality rates are higher in African American Male (AAM) than in European American Male (EAM), even though the smoking rate is less among AAM. It implies that there should be some biomarker genes that can distinguish lung cancer between AAM and EAM. Traditionally, biomarker genes are identified as a cohort, which reflects the average behavior of the cohort and fails to account for individual genetic variability. Thus, the existing computational approaches could not find biomarker genes that differentiate lung cancer between AAM and EAM. This study developed a pipeline to identify patient-specific biomarker genes that may explain lung cancer disparity between AAM and EAM. METHODS: We used a deep-learning-based computational model, Transcriptome State Perturbation Generator, to determine transcription state alterations such as up and down-regulated genes between tumor and healthy tissues of an individual. These patient-specific perturbed genes have implications in precision medicine. This information will also allow us to decipher both common and race-specific risk factors of lung cancer development in AAM and EAM. We used gene expression data of lung cancer and healthy cohorts for analysis. RESULTS/EXPECTED RESULTS: The results showed that the deep learning model could identify patient-specific biomarker genes of individuals. There were few overlaps across the biomarker genes of individual patients of the same race, indicating that identified genes are truly patient-specific. We were able to identify three separate sets of important genes, AAM-specific and EAM-specific biomarkers, as well as common biomarkers between the AAM and EAM cohorts. DISCUSSION: This study identified both patient-specific and race-specific risk factors of lung cancer development in AAM and EAM, which will help develop personalized treatment and alleviate lung cancer health disparity.

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

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TELMISARTAN PRE-TREATMENT INCREASED ANTI-CANCER POTENTIALS OF CFM 4.17 FORMULATION AND OSIMERTINIB COMBINATION BY REDUCING TUMOR-STROMAL BARRIERS AGAINST NSCLC XENOGRAFTS IN MICE

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Abstract

PURPOSE: To study the anti-cancer effects of Telmisartan (TLM), Osimertinib (OSM), and Cell cycle and apoptosis regulatory protein 1 (CARP-1) functional mimetic treatments (CFM4.17) in different combinations against experimental NSCLC. METHODS: 2.5 million H1975 cells were injected into the right flank of athymic nude mice. When the tumor volume reached 1500 mm3, the animals were treated with CFM-F (40 mg/kg body weight) and OSM

(25 mg/kg body weight) alone. For the CFM 4.17 solution, TLM, and OSM combination, animals were pre-treated with TLM (10 mg/kg body weight) three times per week, followed by two weeks of CFM4.17-solution (40 mg/kg body weight) and OSM. For the TLM, CFM-F, and OSM combination, animals were given TLM three times a week for two weeks before receiving CFM-F (40 mg/kg) and OSM (25 mg/kg) for two weeks. When the tumor burden increased beyond 6000 mm3, the animals were sacrificed, and tumor and blood sample was collected from all animals for proteomic, RNA-seq, and western blot experiments. RESULTS: TLM pre-treatment effectively increased the anticancer potentials of CFM-4.17 nanoformulation and OSM combination (TLM_CFM-F_OSM) than their respective single treatments and combination with CFM 4.17 solution form to reduce tumor growth and development in NSCLC tumor bearing mice. Data from RNA sequencing and proteomics revealed that this TLM_CFM-F_OSM combination 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 confirmed by RT-PCR, proteomics, and western blotting.CONCLUSIONS: Our findings suggest that 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: 1.0 - Basic and Applied Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: Authors would like to acknowledge National Institute on Minority Health and Health Disparities of National Institutes of Health, Grant/Award Number: U54 MD007582.

TRANSCRIPTOMIC AND PROTEOMIC ANALYSIS REVEALED CANNABIDIOL AND TETRAHYDROCANNABIVARIN SIGNATURES TO OVERCOME DOX RESISTANCE IN MDA-MB 231 XENOGRAFTS IN ATHYMIC NUDE MICE

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Abstract

PURPOSE: To study the Chemosensitization effects of cannabidiol (CBD) and tetrahydrocannabivarin (THCV) in combination with doxorubicin (DOX) against triple negative breast cancers xenografts. METHODS: The chemo sensitization effect of CBD and THCV in combination with DOX was studied using xenotransplanted DOX resistant MDA-MB-231 cells. After subcutaneous injection of 2.5 million DOX resistant MDA-MB-231 cells in 100 µL matrigel, nude mice were randomized to one of six groups (Control, DOX alone, CBD alone, CBD+DOX, THCV alone and THCV+DOX). In the combination study, CBD (10 mg/kg, i.p.) and THCV (15 mg/kg, i.p.) were given one day before DOX (5 mg/kg, i.p.) to assess the chemo sensitization effect. The treatment was repeated twice a week for 3 weeks until the control group reached 6000 mm3. Using a vernier caliper, the tumor volumes were measured. The animals were euthanized and their blood and tumors collected for further study. RESULTS: CBD and THCV pre-treatment effectively increased DOX's anticancer potentials, reducing tumor growth and development in mice bearing DOX resistant MDA-MB-231 tumors. Data from RNA sequencing and proteomics revealed that CBD and THCV regulate apoptosis, oxidative stress, and inflammation by targeting the PDL-1 pathway, AMPK pathway, histone proteins, sertonergic pathway, CB1 receptors, and P38-MAPKinase pathway, thereby enhancing the chemosensitization effects of DOX against MDA-MB-231 breast cancers. RT-PCR and westernblot analysis were used to validate the same expression genes and proteins found in RNA sequencing and proteomics. In addition, we discovered significant changes in histone acetylations when CBD/THCV was combined with DOX. CONCLUSIONS: According to the results of RNA sequencing and proteomic studies, CBD and THCV appear to have a chemosensitization effect on DOX by reversing histone modifications and their downstream effectors.

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

Grant Support: Authors would like to acknowledge National Institute on Minority Health and Health Disparities of National Institutes of Health, Grant/Award Number: U54 MD007582.

ROLE OF THE ELMO/DOCK180/RAC1 PATHWAY IN BREAST CANCER CELL FUSION-DRIVEN TUMOR HETEROGENEITY AND METASTASIS

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Abstract

Although approximately 90% of cancer-related deaths are caused by metastasis, mechanisms driving metastasis are still not well understood. Here, we assess cancer cell fusion as a mechanism of metastasis, and a potential basis for the disproportion in breast cancer heterogeneity between black and white women. Previous studies showed that cancer cell fusion enables rapid diversification and subsequent intra-tumor heterogeneity supportive of metastasis. A recent work identified apoptotic cells as a new type of cue that induces signaling via the Phosphatidylserine receptor BAI1 to promote fusion of myoblasts by means of signaling through Elmo/ Dock180/ Rac. The ELMO/Dock180/Rac1 pathway is activated in breast cancer. We therefore hypothesized that hypoxia stress-induced apoptosis in primary tumors stimulates fusion between tumor cells and cells of the tumor microenvironment by a mechanism involving BAI1 activation and signals through ELMO/Dock180/Rac1 pathway. To test our hypothesis, we used metastatic (MDA-MB-231 and MDA-MB-157) and non-metastatic breast cancer cells (T47D, HCC1806) isolated from women of different ethnic backgrounds. Bone marrow-derived mesenchymal stem cells (MSCs) were used as fusion partners of breast cancer cells and the cre/ loxp-stop-loxp-GFP system was used to identify fusion products. We found that inhibition of ELMO or Dock 180 significantly reduced fusion of breast cancer cells with MSCs ($P<0.05$). Treatment of breast cancer cells with a Rac inhibitor, significantly reduced fusion between breast cancer cells and MSCs as well ($P<0.05$). We observed that breast cancer cells isolated from black women could fuse more readily with MSCs than cells isolated from white women ($P<0.05$). This might account at least in part to the more aggressive behavior of breast cancer in black women compared to white women. Additional studies on the ELMO/ Dck180/ Rac signaling might unravel new targets for drug development in the treatment of breast cancer.

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

Grant Support: 1U54MD015929-01

TARGETING LIPOGENESIS IN DRUG RESISTANT PROSTATE CANCER

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Abstract

PURPOSE Enzalutamide represents the last in a series of androgen-targeting agents available to prostate cancer (PCa) patients, but its efficacy is limited by the development of resistance. This study builds on recent evidence that lipid metabolism is an important contributor to enzalutamide resistance by investigating the oncogene c-MYC as a novel interacting partner for lipogenic regulator sterol regulatory element binding protein 1 (SREBP-1) in the induction of key lipogenic enzymes including fatty acid synthase (FASN). METHODS Using cell-based models of castration resistance and enzalutamide resistance developed in our lab, our team assessed: (1) the intracellular localization and potential interaction between SREBP-1 and c-MYC; (2) the effect of targeting SREBP-1 and c-MYC on FASN expression and intracellular lipid accumulation and (3) the influence of the SREBP-1/c-MYC/FASN axis on tumorigenicity, cancer cell migration and enzalutamide sensitivity. RESULTS / EXPECTED RESULTS After validating a resistant phenotype in PCa sublines using viability assays and expression of resistance markers, we

observed an enhanced lipogenic phenotype of enzalutamide-resistant PCa cells through enhanced lipid accumulation and expression of lipogenic enzymes. Resistant cells overexpressed SREBP-1 and c-MYC compared to their sensitive counterparts. SREBP-1 and c-MYC co-localization was observed in resistant cells, and an interaction between these proteins was confirmed by co-immunoprecipitation. Targeting of c-MYC and SREBP-1 resulted in marked suppression of FASN expression, intracellular lipid accumulation, and cellular migration of enzalutamide-resistant cells. Reduced cell migration and enhanced sensitivity to enzalutamide were observed following treatment with FASN inhibitors. DISCUSSION / CONCLUSION Our results indicate that c-MYC may act as a surrogate for AR, contributing to enzalutamide resistance in prostate cancer through sustained metabolic reprogramming toward fatty acid synthesis.

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 the Ponce Research Institute (PRI) and Research Centers in Minority Institutions (RCMI) Grant 5U54MD007579-36 Pilot Program.

PROTEIN O-GLCNACYLATION IN ACUTE LUNG INJURY

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Abstract

PURPOSE: Inflammation plays an important role in acute and chronic lung disease. Cellular inflammatory responses are complex and involves transcription factors and genes that mediate the progression of inflammation. Lungs by their nature are almost all the time exposed to pathogens and thus maintenance of balance between inflammation and anti-inflammation is essential for lung homeostasis. HYPOTHESIS: In the present study, we investigated whether N-Acetylglucosamine (GlcNAc) attenuates lipopolysaccharide (LPS)-induced upregulation of CCL18, a chemokine involved in immune and inflammatory responses. MATERIALS AND METHODS: The A549 cells were exposed to two doses of LPS, GlcNAc, or pretreated with GlcNAc and then exposed to LPS for 24h. Total RNA was extracted using TRIzol and cDNA was generated and analyzed by real-time qPCR with specific primers. ROS, cell morphology, and ELISA were performed using fluorescent microscopy and ELISA kit. RESULTS: Our results indicate that GlcNAc attenuates the low dose of LPS-induced upregulation of CCL18 mRNA. Exposure of A549 cells to LPS induced a 4-fold increase of CCL18 mRNA vs control untreated cells. Pretreatment of cells with GlcNAc alleviated LPS-dependent upregulation of CCL18 mRNA. Western blot analysis showed an increase in O-GlcNAcylation of proteins from samples treated with LPS. GlcNAc alone did affect cell viability or cell morphology. CONCLUSION: These results indicate that GlcNaC downregulates LPS-induced CCL18 mRNA. GlcNAc plays a key role in post-translational protein modifications such as protein O-GlcNAcylation which has been shown to limit inflammation. CCL18 is a secreted chemokine and these data suggests that alveolar epithelial cells under external acute injurious stimuli undergo an acute extracellular inflammatory signaling by secreting inflammatory mediators in this study CCL18 and thus influencing extracellular environment.

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

Grant Support: U54MD015929

NEUROPSYCHIATRIC EFFECTS OF HIV-1 INTEGRASE INHIBITORS

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Abstract

PURPOSE: Approximately 1.2 million people in US and 37 million people worldwide are living with HIV-1. In spite of considerable progress in HIV/AIDS research, anti-retroviral therapy (ART) remains the only treatment option for HIV-1 infection. While ART has been highly effective in controlling the virus and making HIV infection a manageable disease, drugs used in the ART regimen cause adverse side effects. Among the most widely prescribed ART drugs are integrase strand transfer inhibitors (INSTIs) which block the critical step of HIV-1 integration into host chromosomes. Five INSTIs, raltegravir (RAL), elvitegravir (ELV), dolutegravir (DTG), bictegravir (BIC) and cabotegravir (CAB), are currently prescribed for HIV infection. Although generally reported to be safe and effective there is growing concern about adverse neuropsychiatric effects (NPAEs) associated with newer INSTIs. Therefore, understanding the mechanisms that drive neuropsychiatric effects of INSTIs are critically important for long-term success of ART. To span this knowledge gap, we have been studying INSTI-associated adverse neuronal effects. METHODS: In this study using both in vitro and in vivo models, we investigated the effects of two INSTIs- DTG and RAL on neuronal function. Methods used include RNA seq, microscopy western blotting, RT-PCR. RESULTS: Our results show that DTG exposure resulted in a marked reduction in neurite length, decrease in post-synaptic protein and an increase in glutamate levels. DTG exposure also dysregulated key genes of synaptic function, glutamate and calcium signaling. Specifically, DTG exposure significantly upregulated expression of specific glutamate receptor subunit and calcium channels. These DTG-induced neuronal alterations were not observed with RAL-another INSTI that is not associated with NPAEs. CONCLUSIONS: Our studies will help identify key mechanisms underlying INSTI-mediated dysfunction in neurons that may be targeted to reduce INSTI-associated NPAEs.

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

Grant Support: U54MD007586

EGCG REDUCES NEUROINFLAMMATORY MARKERS IN LPS ACTIVATED BV2 CELLS

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Abstract

PURPOSE: Chronic neuroinflammation has been associated with many neurodegenerative diseases such as Alzheimer's and Parkinson's disease. The chronic activation of microglia can cause neuronal damage by releasing proinflammatory cytokines and reactive oxygen mediators. Epigallocatechin-3-Gallate (EGCG) is a bioactive polyphenol that exhibits significant anti-inflammatory and neuroprotective properties in green tea extract. Our central hypothesis is that the anti-inflammatory properties of EGCG are mediated in part by inhibiting the formation of proinflammatory cytokines, chemokines, and other inflammatory mediators. METHODS: To In this study, microglia BV-2 cells were first stimulated with 1µg/mL Lipopolysaccharide (LPS) for 1hr; then incubated for 24 hrs using various concentrations of EGCG. Cell viability was assessed using resazurin (Alamar Blue) assay, and nitric oxide (NO) release was evaluated using the Griess Reagent Assay. In addition, proinflammatory cytokines were profiled using inflammatory ELISA and PrimePCR array. RESULTS: EGCG caused a concentration-dependent decrease in cell viability of LPS stimulated BV-2 microglia cells for concentrations greater than 150 µM of EGCG. Two concentrations (150 and 175 µM) of EGCG were used to carry out the rest of the experiments. 150 and 175 µM of EGCG reduced NO production, Interleukin (IL-6), macrophage migration inhibitory factor (MIF), Interleukin 2 receptor gamma (IL2rg), and Chemokine C-C motif ligand 9 (Ccl9). Additionally, EGCG upregulated Chemokine C-C motif ligand 17 (CCl-17), Interleukin 11 (IL-11), Colony-stimulating factor 2 (Csf2), and Vascular epithelial growth factor A (VEGF-A). CONCLUSION: EGCG has the potential to provide neuroprotection, autophagic, and anti-inflammatory activity in neurodegenerative diseases.

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

Grant Support: GRANT SUPPORT: Research reported in this project was supported by RCMI NIMHD grant U54 MD007582

DEFICITS IN GLUTAMIC ACID DECARBOXYLASE 67 IMMUNOREACTIVITY, PARVALBUMIN INTERNEURONS, AND PERINEURONAL NETS IN THE INFERIOR COLLICULUS OF SUBJECTS WITH SCHIZOPHRENIA

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Abstract

Aberrant processing of auditory stimuli is a prominent feature of schizophrenia (SZ). Prior studies have chronicled histological abnormalities in the auditory cortex of SZ subjects, but whether deficits exist at upstream, subcortical levels has yet to be established. En route to the auditory cortex, ascending information is integrated in the inferior colliculus (IC), a highly GABAergic midbrain structure that is critically involved in auditory processing. The IC contains a dense population of parvalbumin-immunoreactive interneurons (PVIs), a cell type characterized by increased metabolic demands and enhanced vulnerability to oxidative stress. During development, PVIs are preferentially surrounded by perineuronal nets (PNNs), specialized extracellular matrix structures that promote redox homeostasis and excitatory/inhibitory balance. Moreover, in SZ, deficits in PVIs, PNNs, and the GABA synthesizing enzyme, glutamic acid decarboxylase (Gad67), have been extensively documented in cortical regions. Yet, whether similar impairments exist in the IC is currently unknown. Thus, we compared IC samples of age- and sex-matched pairs of SZ and unaffected control subjects. SZ subjects exhibited lower levels of Gad67 immunoreactivity and a decreased density of PVIs and PNNs within the IC. These findings provide the first histological evidence of IC GABAergic abnormalities in SZ and suggest that SZ-related auditory dysfunction may stem, in part, from altered IC inhibitory tone.

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

Grant Support: U54 MD007601

THE EFFECT OF HUNTERIA UMBELLATA SEED EXTRACT IN COLON CANCER AND INTESTINAL INFLAMMATION

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Florida A&M University (JLP)

Abstract

PURPOSE: The Hunteria umbellata (HU) plant is highly valued for its treatment of fever, pain, gastrointestinal discomfort, diabetes, as well as inflammation. An initiating event in Colorectal cancer (CRC) pathogenesis is inflammation that can result from various stimuli including defective barrier function or microbial dysbiosis. While the effect of HU seed extract has been demonstrated to reduce hypoglycemia, as well as inflammation and edema in rat models, its effect in the intestine is largely unknown. We investigated the effect of HU seed extract on a panel of CRC cells as well as determined whether it has a cytoprotective role against inflammation in vitro. METHODS: CRC cell lines were treated with water-soluble HU seed extract and cell viability was measured using CellTiter-Blue Assay. To induce inflammation in intestinal epithelial cells (IEC), cells were treated with 2.5% Dextran sodium sulfate (DSS). Cells were treated prior to DSS treatment to assess protective effect or following DSS treatment to determine the effect on IEC recovery. RESULTS: The water-soluble seed extract of HU demonstrated a 50% decrease in cell viability in SW480, SW620 and HT29 cells at low concentrations (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. To assess whether

HU extract is cytoprotective, IEC6 cells were pretreated with HU two hours prior to DSS damage. Cells pretreated with HU had significantly higher cell viability compared to cells not pre-treated ($p<0.01$). To assess the restorative effect, cells treated with DSS for 24h were allowed to recover for 24h with or without HU extract. A significantly higher cell viability in HU treated cells was observed compared to untreated ($p<0.01$). These results demonstrate HU seed extract is cytotoxic to a subset of CRC cells and at low doses can be 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: Grant support from the National Institute on Minority Health and Health Disparities of the National Institutes of Health under Award Number U54 MD007582.

CHARACTERIZATION OF THE ANTI-VIRAL ACTIVITY OF THE MOMO30 PROTEIN ISOLATED FROM THE TRADITIONAL AFRICAN MEDICINAL PLANT MOMORDICA BALSAMINA

Dr. Michael D Powell - Morehouse School of Medicine
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Morehouse School of Medicine (MDP, MK, MC, KD, HD, VCB, VF, KK, VMR) Melango Healers (AD) PROMETRA (EB) New Iberia (FV)

Abstract

PURPOSE: To define the active agent of plant extracts of the medicinal plant Momordica balsamina used by Traditional Healers in Senegal. METHODS: We have used a combination of size exclusion filters, Edman degradation, and RNAseq to identify the active agent from water soluble extracts of the plant M. balsamina and determine its gene sequence. We confirm the gene's identity as MoMo30 by expressing the gene by in vitro transcription/translation system (TNT) to confirm its antiviral activity. We also use models of individual steps in HIV-1 replication to determine the mechanism of action of MoMo30. RESULTS: Here we show that the antiviral activity of plant extracts is contained in a 30kDa protein we call MoMo30. RNAseq experiments identify the gene for MoMo30 as a Hevamine A-like protein which is a common plant chitinase. Its normal function is as a plant defensin which normally protects plants against fungal infection. It acts by binding to the glycosyl residues on the viral glycoprotein gp120 and acts as a fusion inhibitor. It has more than 4-fold more activity than the commercially available fusion inhibitor Enfuvirtide (Fuzeon). It appears to select for mutations in gp120 that have reduced levels of glycosylation and select for mutants with reduced glycosylation. DISCUSSION: Momo30 is a part of a treatment for HIV/AIDS used by Traditional African Healers. They use plants to treat individuals for six months and observe long-term suppression of virus. We hypothesize that MoMo30 selects for virus that has a reduced level of glycosylation in gp120 during treatment. Gp120 is normally heavily glycosylated. It is thought that this is one reason for a reduced immune response to HIV that fails to induce broad-based neutralizing antibodies. MoMo30 appears to induce reduced glycosylation and possibly allows a vigorous immune response, which induces long-term suppression.

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

Grant Support: This project has been supported in part by The MSM Innovation Fund, The Ford Foundation, and RCMI grant U54MD007602

CROSS-TALK BETWEEN ΓC-JAK3 AND ADENOSINE RECEPTOR PATHWAYS

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C., S.A.C, R.A.K)

Abstract

PURPOSE: JAK3 tyrosine kinase strictly associates with the common gamma chain (γc) of Interleukin-2 (IL-2), IL-4, IL-7, IL-9, IL-15 and IL-21 cytokine receptors. Individuals with loss of function mutations in either JAK3 or γc develop Severe Combined Immunodeficiency (SCID) syndrome from deficient T-cell and NK-cell development, as well as dysfunctional B-cells. Surprisingly, inactivating mutations within the gene encoding adenosine deaminase (ADA), the enzyme which breaks down the naturally occurring ubiquitous nucleoside adenosine, also causes SCID in humans. Adenosine signals through G-protein coupled receptors differentially expressed throughout the body including within lymphocytes. It is unknown how dysregulation of these two distinct signaling pathways, γc-JAK3 and adenosine receptors, can result in the same detrimental immune disorder. METHODS: The human T-cell line, Kit225, was pre-treated with increasing concentrations of adenosine in combination with the adenosine deaminase inhibitor, Pentostatin, prior to IL-2 stimulation in order to investigate a regulatory link between adenosine receptor signaling and γc-JAK3 pathways,. Immunoprecipitated protein was Western blotted to detect tyrosine phosphorylation an indicator of JAK3 and γc activation in response to cytokine stimulation. RESULTS: In this study, we observed adenosine inhibition of IL-2 signaling proteins suggesting a universal mechanism of cross-talk between adenosine and γc-JAK3 signal transduction pathways. DISCUSSION/CONCLUSION: The study establishes a mechanism of action governing adenosine receptor regulation of γc-JAK3 signaling and potential targets for therapeutic intervention of ADA driven SCID disorder.

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 grants from the National Institute on Minority Health and Health Disparities, a component of the National Institutes of Health (5U54MD007592) and from the RISE Scholars Program at UTEP funded by the National Institute of General Medical Sciences (R25GM069621-18).

JAK1 ALL-MUTATION DOMINANTLY IMPAIRS TYR PHOSPHORYLATION

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Border Biomedical Research Center, University of Texas at El Paso (ER-E, AHG, GR, ACR, AL, JEM, M-YL, RAK).

Abstract

PURPOSE: Overactive Janus kinases (JAKs) are known to drive leukemias making them well suited targets for treatment. We sought to identify new JAK activating mutations and instead found a JAK1 inactivating pseudokinase mutation. In contrast to other pseudokinase mutations that canonically lead to an active kinase, the JAK1 V666 mutation led to under activation seen by reduced phosphorylation. To understand the functional role of JAK1 V666 in modifying kinase activity we investigated its influence on other JAK kinases and within the Interleukin-2 (IL-2) pathway. METHODS: Using Whole Exome Sequencing, the unreported mutation V666, was detected within the pseudokinase JH2 domain of JAK1 from a Hispanic Acute Lymphoblastic Leukemia (ALL) patient from the UTEP Biorepository and OncoMiner cancer database. A combination of site-directed mutagenesis, in vitro kinase assays, and structural analysis were used in the study to delineate the impact of JAK1 V666 on IL-2 signal transduction. RESULTS: Here we observed a dominant negative effect of inactive JAK1 on JAK3. Specifically, inactive forms of JAK1 produced an inhibitory effect on autoactivation of the JAK family. Interestingly, in the absence of JAK1, JAK3 was capable of tyrosine autophosphorylation. Yet the presence of JAK1 V666 could attenuate JAK3 autophosphorylation and IL-2 induced transphosphorylation. JAK1 V666 not only inhibited its own activity but its presence could inhibit other JAK kinases. DISCUSSION/CONCLUSION: These findings provide new insights into the JAK1 pseudokinase in its potential to modulate not only its own activity but of other JAK kinases as well. Thus, the features of the JAK1 Val 666 region in modifying JAK kinases can be exploited to inhibit overactive JAKs.

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 by grants from the National Institute on Minority Health and Health Disparities, a component of the National Institutes of Health (5U54MD007592) and from the RISE Scholars Program at UTEP funded by the National Institute of General Medical Sciences (R25GM069621-18).

STRUCTURE-FUNCTION OF NOVEL JAK AUTOPHOSPHORYLATION SITES

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Border Biomedical Research Center G.R, G.S.M, O.D.N, S.S, W.G, Y.X, L.L, A.L, C.X, J.A.R, R.A.K); The University of Texas at El Paso G.R, G.S.M, O.D.N, S.S, W.G, Y.X, L.L, A.L, C.X, J.A.R, R.A.K);

Abstract

PURPOSE: Janus tyrosine kinase 3 (JAK3) is essential for signaling by the common gamma chain (γc) family of cytokines and is found primarily in cells of the immune system. The importance of JAK3 mediated signaling is illustrated by the development of hematological cancers such as leukemia, severe combined immunodeficiency (SCID) or autoimmune disease states. Five JAK3 tyrosine phosphorylation sites are currently known to regulate kinase activity, Y785, Y904, Y939 Y980 and Y981. METHODS: In this study, we used a functional-proteomics approach coupling a JAK3 autokinase assay to mass spectrometry and identified eleven novel tyrosine phosphorylation sites spanning the seven Janus Homology (JH) domains of JAK3. Site-directed mutagenesis was used to create phospho-deletion mutations for the residues identified. Antibodies were generated against seven sites to further study their role in JAK3 activation and gamma chain cytokine signal transduction. RESULTS: Novel JH1 tyrosine residues were found to be evolutionarily conserved across JAK family members as well as across multiple species. Phospho-deletion mutants revealed that the JH1 residues are necessary for full activation of STAT5B. Phospho-specific antibodies generated showed specificity for phospho-peptide over non-phospho peptide and recognized auto-phosphorylated JAK3 in human T-cell lines. A JH1 site recognizing antibody developed by this study cross-reacts with JAK1, JAK2, and TYK2 homologous tyrosine residues and is capable of detecting constitutively activated phosphorylated protein from human leukemia cell lines. DISCUSSION/CONCLUSION: These findings reveal a structural-functional role of phosphotyrosine residues within JAK3 and support a mechanism by which constitutive phosphorylation maintains JH1 dimerization. Importantly, the tools developed in this study show potential to explore hematopoietic cancers driven by JAK family members and may propagate new ways to inhibit overactive JAK protein.

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 by grants from the National Institute on Minority Health and Health Disparities, a component of the National Institutes of Health (5U54MD007592) and from the RISE Scholars Program at UTEP funded by the National Institute of General Medical Sciences (R25GM069621-18).

CHANGES IN VIRAL REPLICATION OF HIV-1 VIRAL PARTICLES HARBORING T218I/S INTEGRASE POLYMORPHISMS

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Ponce Health Sciences University (ERL, PL, VRA); Erasmus University Medical Center (TM)

Abstract

PURPOSE: Antiretroviral treatment failure has remained a critical issue for HIV-1 patients worldwide. Risk factors include lack of adherence to antiretroviral drugs and the emergence of drug-resistance mutations (DRMs) on the HIV-1 genome. DRMs and polymorphisms compromise antiretroviral therapies by increasing viral replication in a host. Given the importance of the integrase protein during viral replication, studies have aimed to elucidate resistance patterns for therapies that include integrase inhibitors (INSTIs). Specifically, studies demonstrated that substitutions

on the C-terminal domain of the integrase protein could increase integration and viral replication in the presence of INSTIs. Therefore, we decided to investigate two C-terminal domain polymorphisms (T218I/T218S), their effect on protein functionality, and INSTIs efficacy. Our overall goal is to investigate if combining the T218I/S polymorphisms with DRMs could increase viral integration, replication and provide resistance to INTIs. This part of our project aimed to develop infectious HIV-1 particles harboring specific DRMs/polymorphisms and observe their effects on viral replication. METHODS: Our methods consisted of electroporation to transform proviral plasmids, transfection using 293 T-cells to produce infectious viral particles, real-time PCR to measure viral-RNA copies, and P24 ELISA to quantify viral particles. Short-infectivity assays were performed in TZM-bl reporter cells to determine the infectiousness of viral particles and to observe replication changes between viruses with and without the T218I/S polymorphisms. RESULTS: Our results demonstrate that viral particles could infect TZM-bl cells in an in-vitro setting but showed no significant viral replication differences between viruses. DISCUSSION: This study suggests that the T218I/S polymorphisms do not limit HIV replicative capacity.

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

Grant Support: National Institute of Minority Health and Health Disparities (U54MD007579); PHSU NIGMS-RISE (2R25GM082406); PR INBRE (G12 MD007579)

INSIGHTS INTO REFUGEE POST MIGRATION STRESS AND BREAST CANCER

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Abstract

PURPOSE- Breast cancer is the most-commonly diagnosed cancer and the second-leading cause of cancer death among women in the United States (US). While early detection and treatment effectively reduce morbidity and mortality associated with the disease, breast cancer cases are expected to rise from COVID-19-related treatment delays and lack of screening. This is particularly concerning for refugee women, who are less likely to undergo screening due to poor health literacy and other factors. Displaced Syrians are one of the largest refugee populations in the world. More than 20,000 Syrian refugees are resettled in the US. Houston, Texas is an active refugee resettlement city, hosting ~300 Syrian refugee families. Psychological trauma and the practical challenges of displacement make preventive health practices negligible in this high-risk group. METHODS- A validated Breast Cancer Screening Beliefs Questionnaire (BCSBQ) and refugee post-migration stress scale (RPMSS) were used to examine breast cancer awareness and attitudes towards screening and mental distress respectively. Markers of oxido-inflammation were examined in saliva samples collected from Syrian refugee women. RESULTS- In our sample of Syrian refugee women, 50% of Syrian refugee women (N=42) reported biased attitudes towards general health check-up, exhibited limited breast cancer knowledge, and experienced elevated barriers to mammogram screening. Significant correlations were observed between BCSBQ and RPMSS. Salivary cortisol, oxido-inflammation markers were significantly elevated in Syrian refugee women when compared to Arab community controls. DISCUSSION- This data is significant considering reported connection between psychological stress and the susceptibility to develop breast cancer. Furthermore, significant correlations between BCSBQ and RPMSS indicate the interrelationship between high psychological stress and low breast cancer literacy and screening.

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

Grant Support: GRANT SUPPORT- This research was funded 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.

DIFFERENTIAL REGULATION OF CCR7 BY GRK2 AND GRK3 IN T CELLS

Ms. Anahi Sanchez - University of Texas at El Paso
A SANCHEZ; M Miller; DA Bassuk; CA Bill; CM Vines
The University of Texas at El Paso (AS, MM, DAB, CAB, CMV)

Abstract

PURPOSE C-C motif chemokine receptor 7 (CCR7) binds to chemokine ligands, C-C chemokine Ligand 19 (CCL19), and CCL21. The primary function of CCR7 in T-cells is to direct their migration to secondary lymphoid organs. Although both ligands activate G-proteins, CCL19 promotes high phosphorylation levels on CCR7 while CCL21 does not. The mechanisms behind this biased signaling are not entirely understood. However, we hypothesize that CCR7 bound to its ligands differentially recruits G protein-coupled receptor kinase 2 (GRK2) or GRK3 to the C-terminus of CCR7, controlling recruitment of arrestin-3 in T-cells. METHODS Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR) Cas-9 lentiviral vectors had site-specific gRNAs to target genomic GRK2 and GRK3 in human T-cells. Then, cells were tested using transwell chemotaxis, CCR7 internalization, and calcium mobilization assays. RESULTS We have tested the knockdown of endogenous GRK2 and GRK3, which reflect a genotype of disrupted GRK2 and GRK3 T-cells. Migration and internalization assays with the modified T-cells show more chemotaxis and higher internalization of CCR7 (+20% and +10% for CCL19 and CCL21) with a deficiency of GRK2. Disruption of GRK3 reduces the internalization of CCR7 (loss of 10% for both ligands) without affecting the migration of T-cells. Disruption of either GRK increases calcium mobilization in T-cells regardless of which ligand stimulates CCR7, 25% and 20% with CCL19 and CCL21 respectively, compared to 4% and 6% in normal T cells. DISCUSSION Ultimately, these studies will allow us to define differences in roles of GRK 2 or 3 in CCR7 signaling that may provide insight into the biased signaling elicited by each ligand. Disruption of either kinase had a variance in biased signaling, either elevating or depressing the receptor activity. Modifying the activation of CCR7 can expand the potential therapies for T-cell Acute Lymphoblastic Leukemias (T-ALL), which invade the central nervous system.

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

CHARACTERIZATION OF THE MICROBES AND VIRUSES PRESENT IN THE TIJUANA RIVER AND ESTUARY

Dr. Karilyn E Sant - San Diego State University
Karilyn E Sant, Nicholas Allsing, Alexandra Fox, Scott Kelley
San Diego State University

Abstract

The Tijuana River is a binational watershed at the US-Mexico border. This watershed has received ample attention for its repeated contamination of local communities due to inadequate water containment and treatment infrastructure. As such, these surface waters frequently exceed water quality standards, posing a potential risk to public health in the neighboring communities. Here, we characterize the microbial contamination within transborder flows of the Tijuana River. We utilized untargeted metagenomic sequencing to create a microbial profile of the watershed, with special attention to potential pathogens. Detection of fecal indicator bacteria and viruses, including crAssphage, E. coli, and HF-183, indicated significant sewage contamination of the river at all timepoints. The proximity of the sampling site to the ocean, which receives tidal flushing, was proportional to the total amount of fecal indicator microbes and viruses. Following controls for breadth of coverage, we found high concentrations of several diarrheal enteropathogens, including Salmonella enterica and Arcobacter cryaerophilus. In conclusion, metagenomic assessment of the microbial communities in the Tijuana River allowed us to assess the abundance and constitution of

sewage contamination in the Tijuana River. Several enteropathogens were widely detected in these samples, suggesting the presence of diarrheal diseases in upstream Tijuana but also that this highly contaminated waterway may pose public health risk in the border communities.

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

Grant Support: Research is supported by the National Institute on Minority Health and Health Disparities of the National Institutes of Health under award number U54MD012397. Additional support for KES was provided by K01ES031640.

MOLECULAR DETECTION PLATFORM FOR CANCER RELATED PATHOGENS

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Tuskegee University (AS, HP, EI, HW)

Abstract

PURPOSE: Researchers have developed a clear link between high frequency of asymptomatic infections in the cancer development via induction of long-term chronic inflammation. Nearly one quarter of cancers in resource-limited communities are infection related. Therefore, our goal is to develop a rapid, cost-efficient, reliable, and easy to use molecular detection platform that will allow to detect and discriminate multiple pathogens which are associated with carcinogenesis, cancer progression or treatment. METHODS: In this study, a simple colorimetric and loop mediated isothermal amplification (LAMP) assay was developed and standardized for rapid screening of cancer related pathogens, including Human immunodeficiency virus-1, Human Papilloma Virus-16, and Epstein-Barr Virus. The amplification can be visually detected based on color changes. We designed different set of primers for LAMP targeting the conserved genes of HIV-1, HPV-16 and EBV and analyze them for their specificity and limit of detection. RESULTS: The primer sets demonstrated the 100% specificity to their respective pathogenic RNA and no cross- reactivity was observed with other pathogenic RNAs. We were able to detect as low as 4 RNA copies per reaction within a short period of time (20 -25 minutes) with LAMP. The LAMP products were also detected with gel electrophoresis, and it corresponded with colorimetric detection method. DISCUSSION: LAMP is a rapid, highly sensitive and specific method that amplifies target sequences under isothermal conditions and does not require expensive thermal cyclers. Thus, it is suitable approach for point of care use especially in underserved communities. LAMP could serve as powerful detection tool for low intensity infection due to its sensitivity and selectivity and help cancer risk management and treatment decisions. Rural communities would benefit from this highly sensitive diagnostic to inform timely treatment of infectious or even chronic diseases, like cancers.

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

Grant Support: RCMI PILOT project under Parent Grant 5U54MD007585-27

IDENTIFICATION OF KINASE(S) PHOSPHORYLATING WDR77 PROTEIN

Dr. Hyun-Dong Shin - Clark Atlanta University
HYUN-DONG SHIN; ZX Wang
Clark Atlanta University Center for Cancer Research and Therapeutic Development (CCRTD)

Abstract

PURPOSE: WDR77 is a core component (MEP50) of the protein arginine methyltransferase PRMT5 complex methylating specific arginines in several spliceosomal Sm proteins and histone H4 arginine 3 di-methylation (H4R3me2) and is also known as an androgen receptor coactivator (p44) highly associated with prostate cancer development. In prostate cancer, nuclear p44 inhibits prostate cancer growth by regulating cell cycle regulatory genes,

including p21. Conversely, cytoplasmic p44 promoted prostate cancer growth through upregulation of cyclin D2 and CDK6. The function and localization of WDR77 might be highly affected by phosphorylation. However, WDR77 phosphorylating kinase(s) is not identified yet. This study is about the identification of kinase(s) phosphorylating p44 by kinase inhibitor library screening. METHODS: The PC3 cell and Tocriscreen Kinase Inhibitor (KI) Library (Bio-Techne) were used in this study. The KI treated whole-cell protein was separated by Phos-tag SDS-PAGE and the phosphorylated and unphosphorylated p44 were detected using Anti-p44 after Western-blot. Image J was used for the relative quantification of phosphorylated ([Pi-p44]) or non-phosphorylated p44 ([p44]). RESULTS: 5 kinase inhibitors, CHR 6494 trifluoroacet (haspin kinase inhibitor), PHA 767491 hydrochloride (CDK inhibitor), API-1 (AKT inhibitor), AZ 191 (DYRK1B inhibitor), and ERK5-IN-1 (ERK5 inhibitor) were finally screened as the candidates targeting kinases potentially phosphorylating p44 from 160 kinase inhibitors and their IC2-fold (inhibition concentration for 2-fold inhibition) were also determined. Particularly, the combination of PHA 767491 hydrochloride and ERK5-IN-1 at IC2-fold showed a strong synergy on inhibition of the p44 phosphorylation (45-fold inhibition). CONCLUSION: The kinase inhibitor library screening suggests that haspin kinase, CDK, AKT, DYRK1B, and ERK5 are potential kinases phosphorylating p44 and CDK and ERK5 might be closely connected to p44 phosphorylation.

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

Grant Support: This research was funded by NIH/NIMHD: U54 Research Centers in Minority Institutions (RCMI) (Grant #: 2U54MD007590-34).

INVESTIGATING PULMONARY DISTRESS PREVALENCE DUE TO PARTICULATE MATTER EXPOSURE

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College of Health and Sciences

Abstract

Despite overall improvement of air quality in North Carolina during the past two decades, sporadic yet continuing episodes of poor air quality in several areas across this state are a concern for public health. A recent publication using Durham-based data indicated a prevalence of asthma at 8+/-2%, though significantly higher within ethnic minorities, and exposure to ambient air pollutants is a major contributor. A current challenge is that components of particulate matter (PM) air pollutants are not universally consistent, and measurement occurs over broad geographic domains. Though the causal roles of acute respiratory exacerbations such as asthma and acute respiratory diseases are emerging, the impacts of exposure to air pollutants including fine particulate matter (PM2.5, PM aerodynamic diameter equal to or smaller than 2.5µm), are not well understood. Of the 12 ZIP codes of Durham, North Carolina, NC Hospital Discharge Data indicated that 27701 carried highest population of non-white hospitalization dues to pulmonary exacerbation. We used Census tract data to further distinguish locations high and low minority populations with 27701, for more granular quantification and collection ambient air PM2.5. Our preliminary studies indicate both an increase in daily rates of ambient PM as well as increased toxicity of PM collected in minority-dense regions of 27701. For further studies, we aim to delineate pathological mechanisms that occur after exposure to the ambient air pollutants collected from regions mentioned above for building an ex vivo exposure study model. Our data can be used to inform the community for health equity determination of land use development.

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

Grant Support: none

PI3K INHIBITION REDUCES THE VIABILITY OF U937 CELLS

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Abstract

PURPOSE U937 lymphoma cells are characterized by the translocation of Myeloid/Lymphoid Or Mixed-Lineage Leukemia; Translocated To, 10 (MLLT10). MLLT10 is involved in histone methylation and transcription regulation and in U937 cells it is fused to CALM, a clathrin assembly protein that binds to phosphoinositides. The phosphoinositide 3-kinase (PI3K)/AKT pathway is aberrantly activated in many human cancers. The purpose of this study was to investigate the role of the PI3K/AKT pathway in U937 cells survival and proliferation. METHODS Cell proliferation was determined with the MTT assay, DNA fragmentation was determined with TUNEL labeling followed by flow cytometry and cell cycle analysis was performed with propidium iodide staining followed by flow cytometry. RESULTS Wortmannin, an inhibitor of PI3K, caused a dose-dependent inhibition of cell proliferation with an IC50 0.5 µM at 24 hr. Cell cycle analysis showed the accumulation of cells in G1 phase but with a substantial sub-G1 peak. Treated cells showed elevated TUNEL labeling as opposed to controls, which is indicative of apoptosis. DISCUSSION/CONCLUSION While clinical development of wortmannin as an anticancer agent was discontinued due to adverse effects, PI3K inhibitors with more favorable solubility and toxicity profiles are under development. This study provides further evidence of the importance of this pathway in blood cancers that are characterized with MLLT10 translocations.

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

Grant Support: The authors acknowledge the use of core facilities supported by the National Institute on Minority Health and Health Disparities through grant number 5U54MD013376 and National Institute of General Medical Sciences through grant number 5UL1GM118973.

DEVELOPMENT OF THERAPEUTICS TARGETING TAUOPATHY FOR ALZHEIMER'S DISEASE

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Abstract

Purpose: Alzheimer's disease (AD) is a chronic neurodegenerative disorder that affects an estimated 5 million Americans and is the sixth leading cause of disease in the United States. AD is diagnosed in disproportionally high numbers in African Americans (20% of all AD cases) when compared to non-Hispanic white population and this discrepancy is expected to be further exacerbated in the future. One of the hallmarks of AD is the formation of neurofibrillary tangles consisting of aggregates of the neuronal protein tau. It has been shown that the hyperphosphorylation of tau is a precursor to its aggregation in NFTs. CK1□□and CK1□ are known to phosophorylate tau at several residues including Ser202 and Ser396. CK1□□and CK1□ are highly overexpressed in Alzheimer-affected brain and co-localize with neuritic and granulovacuolar lesions. Inhibition of these kinases should lead to decreased NFT formation. Methods: Organic synthetic methods are used to develop novel kinase inhibitors that are tested in cellular studies for tau phosphorylation inhibition. Results/Expected Results: Our laboratory has identified two lead structures (5-hydroxynaphthalene-1,4-dione and 4,6-diamino-2-methylisoindoline-1,3-dione) that CK1□□□ selective inhibitors. Several derivatives of these lead structures have been synthesized and tested for their CK1□□□ inhibition. Using a cell-based assay in two different well-characterized cell lines (adenocarcinoma HeLa cells and neuroblastoma SH-SY5Y cells), we find that several of our newly synthesized inhibitors show a significant reduction in tau phosphorylation at Ser202 and/or Ser396. We are also using recombinantly expressed and purified components in a reconstituted biochemical assay to determine whether our inhibitors block the CK1□-dependent phosphorylation of tau in vitro. Conclusion: Together, these studies are identifying lead compounds which we will use in animal models for the treatment of AD.

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

Grant Support: RCMI Supplement 3U54MD007595-12S2

A MOLECULAR SWITCH THAT CONTROLS THE DEGRADATION OF THE REV-ERBA

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Morehouse School of Medicine (TCS, JPD)

Abstract

PRUPOSE: The overall goal of this research is to understand how the degradation of REV-ERBα protein, an important component of the circadian clock, is controlled at the molecular level. When mice are housed in an environment with a 12hrs-12hrs light-dark cycle, REV-ERBα protein is only detectable at around 6 to 10 hours after light is turned on (known as “zeitgeber time”, or ZT time 0). The presence of REV-ERBα only within an approximately 4 hours window (ZT6-10) implies the importance of its rapid elimination from the cells at the appropriate time of the day, perhaps imperative for precise functioning of the circadian clock. METHODS: Multiple deletion mutants of REV-ERBα were generated by in vitro mutagenesis and regions that are important for degradation were determined by a cell-based degradation assay. Co-transfection and immunoprecipitation experiments were performed using various REV-ERBα mutants and SPSB4, an ubiquitin ligase that target REV-ERBα for degradation, to map the regions that are important for their interaction. RESULTS: REV-ERBα degradation 1) does not require traditional lysine-mediated ubiquitination, 2) the N-terminal 25 amino acids may function as a molecular ‘switch’ that imparts a change from a highly stable to highly unstable state, 3) the ubiquitin ligase SPSB4 binds to this ‘switch’ region. Thus, SPSB4 may function through this binding site to determinant if REV-ERBα remains in a stable conformation when it is needed to carry out its functions, or to switch to a highly unstable form such that it is rapidly eliminated when it is no longer needed. DISCUSSION: Results from this study will provide novel insights on how protein degradation is controlled. More excitingly, it provides a handle to investigate how the timely degradation of circadian clock proteins is linked to the precise timing of the circadian clock.

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

Grant Support: RCMI U54 CTRHD Pilot Project Program (TCS); NIH NIGMS grants 1SC1GM109861 and 1R35GM127044

DRUG RESISTANCE IN ART-NAÏVE HIV-1+ PERSONS IN PUERTO RICO

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Ponce Health Sciences University (GT, PL, RS, AA,VRA)

Abstract

PURPOSE Antiretroviral therapy (ART) aimed to prevent development of Drug Resistance (DR) is crucial to reduce risks of virological failure, spread of HIV and transmission of resistant virus. Resistance tests are standard-of-care in managing HIV infection but fail to detect Minority Drug Resistance Mutation (MDRM). We use Next Generation Sequencing (NGS) to assess presence of MDRM in viral RNA (vRNA) and proviral DNA (pvDNA) in treatment Naïve (ART-naive) individuals sampled shortly after diagnosis. METHODS Samples from eight HIV+ ART-naïve subjects were evaluated for MDRM. Demographics, Viral loads and CD4/CD8 counts were obtained. HIV-1 pvDNA and vRNA were extracted from blood and plasma. Protease, Reverse Transcriptase and Integrase genes were amplified (WHO-accredited HIV-1 RNA genotyping protocol) and modified for pvDNA. NGS technology (Illumina-

MiSeq) was used to obtain MDRM sequence data (vRNA & pvDNA). Resistance interpretations were generated with Stanford Drug Resistance Database. RESULTS Of eight samples, six were amplified in all compartments by both methods. ART-naïve reservoir sequences with standard method resembled closely HIV present in circulation. However, using NGS, four of six samples presented MDRM. One individual had a major MDRM, integrase E138EK, detected only by NGS in pvDNA but not in vRNA. DRM were not detected by standard testing. E138EK provides low-level resistance to Integrase Inhibitors. A second individual showed V179D in vRNA but not pvDNA, whereas its partner presented V179D in both vRNA and pvDNA. This provides low-level resistance to NNRTIs. These cases seem to indicate to transmitted MDRM. The fourth case showed no DRM with standard method, however NGS showed Protease accessory mutations G48GR and G73GS in pvDNA. The other samples only differed in polymorphisms. CONCLUSION Despite in low frequency, the presence of MDRM in ART-naïve individuals, underscores the importance of genotypic monitoring when initiating ART regimens.

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

Grant Support: RCMI Program Grant U54MD007579

DYNAMIC GLUCOSE ENHANCED MRI ON EXPERIMENTAL TRAUMATIC BRAIN INJURY

Dr. Tsang-Wei Tu - Howard University
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Howard University (TWT, PCW)

Abstract

PURPOSE Traumatic brain injury (TBI) results in devastating and long last neurologic impairment. The immediate and long-term effects on brain energy metabolism of glucose – a major source of energy for the brain - are not well understood, primarily due to the lack of an effective high-resolution imaging modality for non-invasive brain glucose detection. In this study, we utilized glucose Chemical Exchange Saturation Transfer (glucoCEST) weighted MRI to test the capability of this novel MRI technique in detecting the pattern of glucose uptake in the rat brain. METHODS We performed a dynamic glucose enhanced (DGE) MRI on a time course of 2 weeks following closed head TBI on female rats. Animals were imaged with DGE prior to the injury for control, and post-injury on day 1, 7, and 14 (n=5/group). After acquiring 4 baseline DGE dataset, a dose of 0.5 g/kg of clinical-grade Dextrose was delivered intravenously. The CEST data were acquired by fast spin echo on Bruker 9.4T. B0 field inhomogeneity was calibrated by WAter Saturation Shift Referencing. The CEST data were then analyzed by Lorentzian line fitting to separate the hydroxyl (i.e. glucose), amine, amide, and Nuclear Overhauser effects. RESULTS Results show a distinct pattern of the contrast enhancement between the injured rat brains and their baseline controls. Clear contrast enhancements are seen in the thalamus of the control rat brain. Starting from the day 1 post injury, the contrast enhancements were significantly decreased ($p<0.05$, n=5) in the first 15 mins after glucose injection, suggesting the cerebral glucose uptakes and transports were damaged in the TBI brains. In this animal cohort, the glucose uptake/utilization reached the lowest on the day 7 of TBI, and then slightly increased afterward on day 14. DISCUSSION Our result demonstrated that the DGE is capable of detecting a regional difference of glucose metabolism in the TBI brain.

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

Grant Support: HU RCMI- Investigator Development Core, NIMHD 5U54MD007597-33

DIABETES MEDICATION REGIMEN COMPLEXITY AND DIABETES OUTCOMES

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University of California, Irvine, School of Pharmacy & Pharmaceutical Sciences (CW), Charles R. Drew University of

Medicine and Science (CW, EA, SA), CVS Pharmacy (LO)

Abstract

To identify associations between diabetes specific medication regimen complexity (MRC) and glycemic control (hemoglobin A1c; HbA1c), and cardiovascular outcomes (low-density lipoprotein cholesterol; LDL-C, systolic and diastolic blood pressure; SBP & DBP) Demographic, medical history, and clinical outcomes data were extracted from the electronic health records of adult Non-Hispanic Black (NHB) patients living with diabetes. The patient medication list was analyzed to generate a diabetes specific medication regimen complexity index (DM-MRCI) which considers diabetes medications only. The association of the independent variable (DM- MRCI) with the dependent variables (HbA1c, LDL-C, SBP, and DBP) were analyzed with multivariate logistic regression. Diabetes-specific MRC was associated with glycemic control and atherogenic cholesterol control at all levels (low, moderate, high). However, diabetes specific MRCI was not associated with blood pressure control and atherogenic cholesterol control at all levels. Adjusting for several other factors (age, comorbidity burden, alcohol use, BMI, etc.), when compared to patients with low diabetes specific medication regimen complexity, patients with moderate levels of diabetes-specific medication regimen complexity were almost 6 times more likely to have uncontrolled hemoglobin A1c and patients with high levels of diabetes-specific medication regimen complexity were 21 times more likely to have uncontrolled hemoglobin A1c. Finally, patients with moderate levels of medication regimen complexity were 48% less likely to have atherogenic cholesterol (LDL-C) that is not at goal. High and moderate levels of diabetes medication regimen complexity predict poor glycemic control (HbA1c) above and beyond potential confounders, indicating that medication regimens of lower complexity and additional interventions might be needed to achieve glycemic control in this patient population.

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

Grant Support: This study was supported by National Institute on Minority Health and Health Disparities (NIMHD) Grant Award Number U54MD007598

CYTOKINES ASSOCIATED WITH COMORBIDITIES AND SOCIAL DETERMINANTS OF HEALTH PREDICT THE RISK OF BREAST CANCER INCIDENCE AND SURVIVAL IN AFRICAN AMERICAN AND LATINX WOMEN IN SOUTH LOS ANGELES

Dr. Yanyuan Wu - Charles R. Drew University of Medicine and Science
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Division of Cancer Research and Training, Department of Internal Medicine, Charles R. Drew University of Medicine and Science

Abstract

PURPOSE The study is to determine how social and epigenomic factors are associated with Comorbidity (obesity (OB), diabetes (T2D), hypertension (HTN)) resulting in increased risk for breast cancer and poor disease outcome in African-American (AA) and Latinx populations residing in South Los Angeles (LA). This specific study aims to determine a specific group of cytokines associated with Comorbidity and breast cancer. METHODS A total of 908 AA and Latinx women in South LA were selected from the existing database. The demographic, comorbidity, breast cancer information were also collected from the database. Multi-cytokines from serum samples were measured by Luminex assay. The social vulnerability index was obtained through Geographic Information Systems. A generalized structural equation model was used to determine the direct association among the variables. RESULTS The disadvantaged neighborhoods and built environment, and individuals' socioeconomic status (SES), such as education, income, health issuance, etc. directly associated with the high incidence of comorbidity in AA and Latinx in South LA. Comorbidity is directly associated with breast cancer, especially among AA women. Breast cancer patients with OB reduced disease-free survival. Comorbidity increases a specific group of cytokines. OB-associated cytokines include CXCL1, CCL22, CCL4, CCL2, and Leptin. T2D/HTN -associated cytokines are TGFβ1, TGFβ2, Leptin,

TNFα, CXCL1, CCL4, CCL22, IL8 and VEGFα. The cytokines, CXCL1, CCL4, CXCL10, and CCL22 are also significantly associated with breast cancer diagnosed at age<50. Furthermore, Second-hand Smoking and alcohol use are also associated with breast cancer. CONCLUSION Social Determinants of Health, including Comorbid conditions, such as OB, T2D, HTN, Second-hand Smoking, Alcohol use, and SES, influence specific Cytokine expression, and these factors influence breast cancer incidence and survival in AA and Latinx, contributing to cancer health disparities.

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

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

A TREATMENT STRATEGY FOR DIABETES-ASSOCIATED BREAST CANCER

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Abstract

PURPOSE: Diabetes is directly related to the risk of breast cancer occurrence and worsened breast cancer prognosis. Currently there are no specific treatments to target diabetes-associated breast cancer. Our aim is to understand the fundamental mechanisms of diabetes-induced breast cancer progression and to develop personalized treatments. We report a metabolic reprogramming strategy (MRS) that pharmaceutical induction of glucose import and glycolysis to even higher levels with metformin and NF-κB inhibitor (NF-κBi) while blocking the export of excessive lactate via inhibiting monocarboxylate transporter 4 (MCT4) leads to a metabolic crisis within the cancer cells. METHODS and RESULTS: We demonstrated that the MRS shifts the metabolism of breast cancer cells toward higher production of lactate, blocks lactate secretion, prompts intracellular acidification and induces significant cytotoxicity in breast cancer cells. Moreover, we identified a novel MCT4 inhibitor CB-2 by structure-based virtual screening and cell-based chemical screening. A triple combination of metformin, CB-2, and trabectedin, a clinical drug that impedes NF-κB signaling, strongly inhibits breast cancer cells. Importantly, compared to normal glucose condition, MRS elicits more potent cancer cell-killing effects under high glucose condition. Animal model studies show that diabetic conditions promote the proliferation and progression of breast cancer xenografts in nude mice and that MRS treatment significantly inhibits HG-induced breast cancer progression. CONCLUSION: Pharmacological inhibition of MCT4 combined with metformin/NF-κBi is a promising cancer therapy, especially for diabetes-associated breast cancer.

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.

NOVEL PYRIMIDINE NUCLEOSIDES: ANTICANCER AGENTS AGAINST PANCREATIC CANCER

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32307

Abstract

Purpose: Pancreatic cancer is a deadly disease that is mostly diagnosed at an incurable stage. The American Cancer Society estimated an incidence of 62,210 cases of pancreatic cancer for the year 2022 with 49,830 deaths that 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 developed through chemical modification of 5-FU by modifying position 1 with a tetrahydrofuran ring, and position 4 with a carbamate chain. The analogs were characterized using nuclear magnetic resonance (NMR), micro-elemental analysis, and the 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 1.5 to 5.6 fold improvement in anticancer potency compared with 5-FU. The inhibitory concentration (IC50) values 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 2.15 ±1.3 µm (XYZ-I-113) compared with 12.1 ±1.3 µm for 5-FU. The analogs XYZ-I-79 and XYZ-I-113 demonstrated the most significant anticancer activities against MiaPaCa-2 cells compared with 5-FU, XYZ-I-71, and XYZ-I-73. Conclusion: The XYZ-I-79 and XYZ-I-113 analogs may represent novel anticancer agents for the treatment of pancreatic cancer.

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

2.0 - BEHAVIORAL AND SOCIAL DETERMINANTS OF HEALTH

THE IMPACT OF COVID-19 IN THE ACADEMIC ACTIVITIES AT THE UPR-MSC

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Abstract

PURPOSE: The academic system in Puerto Rico was severely affected by the COVID-19 pandemic. In response to the pandemic, the Puerto Rican government ordered a lockdown that included the closure of the educational system. Currently, academic activities on the island have almost returned to normal. This work presents the results of three surveys conducted among researchers, faculty, students, and staff of the UPR-MSC to assess the impact of COVID-19 on the research activities. METHOD: Two surveys were administered in March and June 2020 (N=20 ea.). A third questionnaire, conducted in March 2021, also included students and vaccine-related questions (N=73).The surveys consisted of 12 (S1& S2) or 15 (S3) questions and conducted using the Survey Monkey platform. The data collected was analyzed using descriptive statistics. RESULTS: Data from the first two surveys revealed an increase in the percentage of investigators working at the UPR-MSC in June 2020 (85%) vs. March 2020 (45%). In June 2020, 75% of the RCMI research projects and facilities were active compared to 50% in March 2020. However, 33% of the investigators remained unable to communicate with study participants due to the COVID-19 restrictions and the need for changes in the IRB protocol. The activities identified as most affected were the administrative services, seminars and conferences, scientist visits, thesis presentations, and the delivery of research supplies. New strategies such as virtual meetings and conferences, e-mails, phone-calls, and social media were implemented to address these challenges. 89% of the participants reported being fully vaccinated. DISCUSSION: The COVID-19 pandemic and the preventive measures executed impacted research activities, especially studies involving human subjects. The

challenges imposed by the pandemic have been overcome by the implementation of new strategies and approaches. The high level of vaccination has allowed many of the activities to return to normal.

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

Grant Support: Grant Support: This work was supported by the National Institute on Minority Health and Health Disparities (award number U54 MD007600).

COVID-19 STRESSORS AND CHILD CAREGIVERS' MENTAL HEALTH

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Ponce Health Sciences University

Abstract

PURPOSE Psychological sequelae have been recognized as important elements of the burden of disease among caregivers of children with Zika virus prenatal exposure. Recognition of the impact of adverse experiences and of biomarkers of stress is important to preventing mental health problems with impact on rearing practices and child wellbeing. METHODS This cross-sectional study explored social determinants of health (SDoH)-mediated toxic stress during COVID-19 and the risk for mental health problems among caregivers of children with prenatal Zika exposure. Twenty-five Hispanic mothers completed surveys assessing SDoH vulnerabilities, COVID stressors and the Impact of Event Scale (IES) to explore post-traumatic stress disorder (PTSD) symptomatology, and provided a sample for hair cortisol concentration (HCC) as toxic stress biomarker. Multivariable linear regression models tested the associations between stressors, IES, and HCC, adjusted for maternal age, education, and child sex. HCC was log-transformed in regression analyses due to skewed distribution. RESULTS Caregivers mean age was 30 years, most have low education (76%), annual income <$15,000 (92%), and unemployed (68%). COVID-19 stressors included limited access to health care services (32%), disruption of child education (88%) and specialized service needs (6/13, 46%), and food insecurity (40%). IES scores suggest that 60% of caregivers experience PTSD symptomatology (score=33+). The median of HCC was 75.6 pg/mg. The adjusted linear regression models showed that women with high IES scores (suggesting trauma) had significantly lower HCC (B=-1.11, SE=0.51, p=0.04). Those with food insecurity had significantly higher HCC (B=1.01, SE=0.48, p=0.049). DISCUSSION / CONCLUSION Dysregulation of the hypothalamic-pituitary-adrenal axis with a reduced response has been described with prolonged stressors. SDoH-mediators provide opportunities to prevent adverse mental health outcomes for caregivers and their children.

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

Grant Support: GRANT SUPPORT NIH-NIMHD; Grant U54MD007579

HEALTH NEEDS OF NON-HISPANIC BLACK ADULTS WITH DIABETES LIVING UNDER POVERTY IN HISTORICALLY MEDICALLY UNDERSERVED AREAS OF SOUTH LOS ANGELES: LACK OF AN EFFECT OF EMPLOYMENT AND INCOME

Dr. Shervin Assari - Charles R. Drew University of Medicine and Science
Cheryl Wisseh, Edward Adinkrah, Shervin Assari
Charles R Drew University

Abstract

Background. The effect of socioeconomic status (SES) indicators such as employment and income in protecting populations and individuals against illness is well-known. Marginalization- related Diminished Returns (MDRs) phenomenon, however, refers to the weaker health returns of SES indicators for Black than White people, particularly

in segregated and underserved areas. Aims. To test the effects of the poverty level as a major SES indicator on various health outcomes for patients with type 2 diabetes. Methods. We used cross-sectional data from South Los Angeles. The sample was limited to Black adults with type 2 diabetes (age between 19 and 98) who were living under poverty and were using health services from a safety net designed for low-income populations. Independent variables were employment and income (lower poverty line vs. 100-200% poverty line). Outcomes included drinking, smoking, drug use, obesity, chronic medical conditions, number of medications, diabetes-related medication complexity, and most recent number of lipid profile, blood pressure, and HgbA1c. Chi-square and independent-sample t-test were used for data analysis. Results. The analytical sample was composed of 440 individuals. With very few examples, we did not consider the effects of employment and income as our two SES indicators on our health outcomes. Patients with diabetes who live in poverty and underserved area suffer a wide range of health problems regardless of their incremental change to their SES indicators. Conclusions. To eliminate racial disparities in health, we need structural interventions that go beyond SES and address historical and geographical causes and contributors that also diminish the returns of SES on the health outcomes of marginalized Black people.

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

HIGHER-THAN-EXPECTED HEALTH PROBLEMS OF HIGH SOCIOECONOMIC STATUS IMMIGRANTS IN THE US: ANALYSIS OF THE NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY (NHANES 2005-2016) DATA

Dr. Shervin Assari - Charles R. Drew University of Medicine and Science
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Chares R Drew University

Abstract

Background: Socioeconomic Status (SES) indicators such as educational attainment protect people against health problems, including but not limited to depression and cardiovascular diseases. However, according to the Marginalization-related Diminished Returns Framework (MDRs), SES indicators such as educational attainment and income may show weaker health effects for marginalized than for socially privileged social groups. Built on the MDRs framework, this study tested the associations between educational attainment and depression and cardiovascular diseases and also tested variation in this association by immigration status. Methods: For this cross-sectional study, we used the National Health and Nutrition Examination Survey (NHANES 2005-2016) data. The sample included 28,682 adults who were either non-immigrant (US-born) or immigrant. Demographic factors (age, sex, race, ethnicity, and marital status), SES (educational attainment), depression (Patient Health Questionnaire-9 scale) and and cardiovascular diseases (self-report) were measured. Weighted Negative Binomial Regression (NBREG) models were used in Stata to adjust for the complex sample design of the NHANES. Models without and with interaction terms were estimated in the pooled sample and by immigration status. Results: Overall, high educational attainment showed an inverse association with depression and chronic cardiovascular conditions, however, we found statistical interactions between educational and immigrant status on outcomes. Our interactions reflected health problems in immigrants with a college education or above compared to US-born individuals with a college education or above. Conclusion: Educational attainment shows weaker health effects on depression and chronic conditions for immigrant than non-immigrant population. Immigrants report high health problems despite their high education.

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

LATINX PERSPECTIVE: CULTURAL ADAPTATION OF A CAREGIVERS-PATIENTS SUPPORT (CASA) PSYCHOSOCIAL INTERVENTION.

Dr. Normarie Torres Blasco - Ponce Health Sciences University

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Abstract

Background: Latinx advanced cancer patients and caregivers are less likely to have adequate access to culturally congruent psychosocial interventions. Objectives: To culturally adapt a Caregivers-Patients Support to Latinx coping advanced-cancer psychosocial intervention to improve spirituality and communication among Latinx coping with advanced cancer. Methods:A qualitative study was conducted, and semi-structured interviews were performed to adapt the psychosocial intervention for Latinx coping with cancer culturally. Discussions were audio-recorded and transcribed as they were conducted. Recordings and transcriptions were reviewed by the study team and analyzed using thematic content coding. Setting/subject:Patients and caregivers with advanced cancer recruited from Ponce Health Science University, Puerto Rico. The semi-structured interview described and demonstrated intervention components and elicited feedback about each. Results:Semi-structured interviews were completed by Latinx advanced cancer patients (n=14; Stage III and IV) and caregivers. When evaluating patients' perspectives on family integration into therapy, we generate three categories: 1) acceptability, 2) helpfulness, and 3) caregivers' integration into therapy. Twelve of 14 patient-caregivers (85.7%) reported the high acceptability of the goals and purpose of the intervention protocol. They also reported the usefulness of the intervention components: communication skills, the willingness of Meaning, life has Meaning, freedom of will, identity, Creative sources of Meaning, and homework. The majority of the participants reported the likelihood (n=9) of integrating family caregivers into therapy and the likelihood (n=10) of the length of the 4-session intervention. Conclusions: Patients-caregivers reported the high acceptability of the adapted intervention. Patients-caregivers reported that they may use the content regularly and that they found most of the content helpful and easy to use.

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

Grant Support: The team would like to acknowledge the contribution (2U54CA163071 and 2U54CA163068) and the National Institute of Minority Health and Health Disparities (5G12MD007579, 5R25MD007607, R21MD013674 and 5U54MS007579-35); National Cancer Institute R21CA180831-02 (Cultural Adaptation of Meaning-Centered Psychotherapy for Latinos), 1R25CA190169-01A1(Meaning-Centered Psychotherapy Training for Cancer Care Providers), 1R01CA229425-0A1 (Couple Communication Skills Training for Advanced Cancer Patients), 3R01CA201179-04S1 (Couple Communication in Cancer: A Multi-Method Examination), 5K07CA207580-04 (Culturally Competent Communication Intervention to Improve Latinos' Engagement in Advanced Care Planning), 5R21CA224874-02 (A communication-based intervention for advanced cancer patient-caregivers dyads to increase engagement in advance care planning and reduce caregivers burden), 5K08CA234397 (Adaptation and Pilot Feasibility of a Psychotherapy Intervention for Latino with Advanced Cancer); and the Memorial Sloan Kettering Cancer Center grant (P30CA008748). Supported in part by 133798-PF-19-120-01-CPPB from the American Cancer Society.

EXAMINING FOOD INSECURITY AMONG ELDERLY MINORITIES IN LEON COUNTY USING TECHNOLOGY

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Abstract

PURPOSE: Literature has documented that food insecurity is integrally tied to health care disparities and health care outcomes. Food insecurity increases the rate of mental health issues, oral health problems, iron deficiency, and increased rates of mental and cognitive disorders. These health outcomes linked to food insecurities perpetuate disparities in health. Combating food insecurity plays a critical role in reducing the prevalence of health disparities. Study purpose is to evaluate the level of food insecurity among older adults and test the effect of a technology intervention, to coordinate access to free or low-cost food. The goal is to provide convenient access to information on healthy food distribution locations and increase participant self-efficacy. Objectives: To evaluate the prevalence of food insecurity in Leon County, Florida among older adults. To develop and test a technology app. Hypotheses: Food

insecurity will be more prevalent in individuals of lower socio-economic status. Participants of lower socio-economic status and adults over the age of 65 will report greater perceived benefits. Participants using the food hub app will report improved user-experiences and increased likelihood of accessing food resources. METHODS: Survey data on quality of life, prevalence of food insecurity, and food quality. Currently under development is a digital Food Hub Application which will be available on IOS and Android platforms. RESULTS: Respondents who ran out of food were more likely to report cutting their meal size, or going hungry. Younger people were more likely to not have eaten for a whole day. Expected Results: The Food Hub app will provide interactive, real-time, and type of food (produce, meat, dry goods, etc.) available at each location. DISCUSSION/CONCLUSION: The food hub app will be a technological intervention with the potential to support address the nutritional needs in Leon County, with implications at the state and national level.

Category: 2.0 - Behavioral and Social Determinants of Health - 2.04 - Social Determinants of Health - 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) under Award Number U54MD007582. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health."

IMPACT OF COVID-19 VACCINATION ON THE DISEASE OUTBREAK IN MISSISSIPPI

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Abstract

PURPOSE: The COVID-19 pandemic can be adequately managed by equitable vaccine distribution and application as different social determinants of health play a crucial role in causing such disparities. This study's main objectives are 1) Assessing the impact of COVID-19 vaccination on the number of cases, deaths, and hospitalization rates in the state of Mississippi; 2) To find out which parameters of social determinants of health influence the COVID-19 vaccination coverage. METHODS: An epidemiological comparison of the CDC's and John Hopkins University's environmental and demographic trends related to Mississippi-COVID-19 data of various counties was conducted. The cumulative case count of COVID-19 data by race, ethnicity, percent poverty population, percent uninsured, and social vulnerability index were collected and analyzed. RESULTS: Fifty-one percent of the total population and 83.3% of the senior population in Mississippi are now COVID-19 vaccinated. Harrison, Hinds, Desoto, and Rankin counties are leading in reporting the no. of COVID-19 cases in the weeks of Feb 8-21, 2022. Webster County has reported the highest no. of cases, 887.60 per 100,000 population. In comparison, Jefferson County has the highest number of people vaccinated (70%) compared to other counties. The Mississippi counties are classified based on a percent of poverty. A positive trend was overserved amongst those counties with a high percentage of people living in poverty (> 7.3%) and an increased number of COVID-19 cases (21.91 % per 100,000). CONCLUSION: Different social determinants of health profoundly affect the COVID-19 vaccination and incidence pattern in various counties of Mississippi. This study demonstrated that social factors trigger an apparent disparity in COVID-19 vaccination. Therefore, statewide policy recommendations focusing on a specific community- need will help achieve health equity in the COVID-19 vaccination management.

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

EXPLORING PROVIDER AND ORGANIZATION LEVEL BARRIERS TO MOUD TREATMENT FOR BLACK AMERICANS: A MIXED METHODS STUDY

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Abstract

PURPOSE: The death rate from opioid-related overdoses has increased dramatically for Black Americans. The purpose of this study is to examine provider and organizational factors that could be limiting the access to medication for opioid use disorder (MOUD) treatment for Black Americans. METHODS: Using the exploration phase of the Explore, Preparation, Implementation, Sustainment (EPIS) framework, the project will be a formative assessment of MOUD treatment availability for Black Americans. Providers of all specialties, both waivered and not waivered to provide MOUD treatment, will be invited to participate in key informant interviews. Using an explanatory sequential mixed-method design, organizations that provide MOUD will be asked to participate in a quantitative online survey. Organization staff will also be requested to indicate if they would be willing to be contacted for a more in-depth qualitative interview. RESULTS/EXPECTED RESULTS: Several preliminary themes have emerged from the provider interviews, including a limited knowledge and understanding of the opioid crisis for Black Americans; the impact of how the opioid epidemic has been framed; the multiple forms of stigma that inhibits patients from accessing treatment; and the need for collaboration and holistic approaches to address the problem. Preliminary results from the organizational surveys and interviews have demonstrated that organizations are offering multiple types of MOUD and support services to their clients. Few have implemented any culturally responsive strategies to provide MOUD for Black clients. DISCUSSION/CONCLUSION This project is illuminating the understandings of individual providers as well as the organizational awareness of the unique needs and challenges faced by Black Americans seeking OUD treatment. As interventions and strategies are chosen and adapted to meet the needs of Black Americans, these local factors influencing the treatment need to be taken into consideration.

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

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RELATIONSHIP BETWEEN E-CIGARETTE ADVERTISING THROUGH SOCIAL MEDIA AND COMMERCIAL MEDIA WITH THE CURRENT E-CIGARETTE USE BY YOUTHS AGED 9-19 IN THE UNITED STATES

Prof. Mian B Hossain - Morgan State University
MB Hossain
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Abstract

PURPOSE CDC reported that spending on e-cigarette advertising rose to $115 million and 18 million youths were exposed to e-cigarette ads in 2014. The objective of this research is to examine the association between e-cigarette advertising through social media and commercial media with the current (last 30 days) e-cigarette use by youths aged 9-19 in the US. METHODS Data for this study were obtained from the 2019 National Youth Tobacco Survey (NYTS). The NYTS is a school-based survey that collects information on tobacco-related behaviors and exposure to tobacco advertisements from middle and high school students. In addition to describing the study population (n=17,597), several unadjusted and adjusted weighted logistic regression models were estimated for assessing the relationship between exposure to advertising and the current use of e-cigarettes by youths. RESULTS Adjusted logistic regression model results show youths aged 9-19 years who “are always or most of the time” exposed to both internet-adds and commercial-adds are 46% (OR=1.46; p<0.001) more likely to use e-cigarettes currently. Results also show that youths aged 9-19 years who are “always or most of the time” exposed to only commercial-adds are 23% (OR=1.23; p=0.006) more like to use e-cigarettes currently. Results also show that youths aged 9-19 years who

are “always or most of the time” exposed to only social media-adds are 7% (OR=1.07; p=0.427) more like to use e-cigarettes currently. CONCLUSIONS E-cigarette advertising appears to encourage e-cigarette use among youths. This study, along with other existing evidence, highlights the need for regulation of marketing strategies that are used by e-cigarette companies, such as JUUL, to prevent and reduce adolescent use of these products. Implementing advertising regulation both on social media and commercial media at the national, state, and local levels is integral to preventing and reducing youth's e-cigarette use.

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

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

SUBSTANCE-USING PARENTS' NEEDS AND USE OF ANCILLARY SERVICES

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Abstract

Substance-using parents account for around 60% of parents in verified child maltreatment cases. Previous studies found that co-occurring problems, such as mental illness are the barriers to their treatment completion. Therefore, they need ancillary services to address their co-occurring problems. But, many of them did not use ancillary services. Few studies examined factors related to their usage of ancillary service. This study examined individual and environmental factors related to ancillary service use. The study was conducted in the Miami. We collected qualitative data from 5 substance-using parents from a family preservation program and 14 professionals who provide services to these parents. The findings showed that housing, domestic violence counseling, and mental health services are the common needs among substance-using parents. Many of them experienced homeless and evictions. When asked about domestic violence, they shared their experiences with domestic violence as well as violence in general, such as childhood experiences with abuse and neglect, community violence, and adulthood experiences with sexual violence. The most common mental illness are PTSD, anxiety, and depression. The parents reported using marijuana to cope with their trauma and mental symptoms. They reported receiving limited services on housing and domestic violence counseling, for which professionals acknowledged that limited services are available. In comparison, mental health services are more available, since the agency that provides family preservation services also provides mental services. Substance-using parents experienced multiple problems. Without resources to address these problems, many of them use substance to cope with stress caused by these problems, and have limited motivation for abstinence. The findings have implications for macro practice regarding service provision and micro practice regarding trauma-informed intervention.

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

GEOSPATIAL CHARACTERIZATION TO MAP COVID 19 HOTSPOT COUNTIES

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Abstract

PURPOSE Coronavirus disease 2019 (COVID-19) was initially thought to be the great equalizer that has no discrimination with who can become infected, now reveals patterns of disparities. Geospatial data and analytical techniques provide increasing capabilities to map and characterize spatial patterns in health disparities. This study was conducted to map and characterize spatial patterns associated with COVID 19 incidences, mortality and their spatial determinates. Specific objectives were to: 1) map and quantify spatial patterns and associations in COVID-19 prevalence and mortality and 2) evaluate significance of sociodemographic and economic indicators as potential determinants of COVID-19 health disparity outcomes. METHODS This study was conducted for all counties of Mississippi, USA. Spatial characterizations of COVID-19 data and sociodemographic and economic indicators were performed using qualitative and quantitative estimates to depict spatial patterns and associations in COVID-19 incidences, mortality and their spatial determinants. Spatial analyses were performed to map and characterize COVID-19 hotspot counties and their sociodemographic and economic indicators. All data were aggregated at county level. COVID-19 variables (racial breakdown & cumulative numbers of COVID-19 cases and deaths) were derived using data for December 15 202– prior to vaccinations. RESULTS Significant (p=0.05) clustering and outliers were detected for COVID 19 as well as sociodemographic and economic variables and thus suggest spatial regression models for detecting potential associations between COVID-19 variables and their spatial determinants of health disparities. Initial analyses based on descriptive statistics also revealed potential associations between COVID-19 and sociodemographic and economic variables. DISCUSSION/ CONCLUSION: These findings thus, indicate the necessity of spatial regression models to evaluate potential indicators of COVID 19 health disparities.

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

Grant Support: This study was supported by and award from NIH NIMHD (grant number 1U54MD015929; Award number 5U4MD015929-02)

CATASTROPHIZING EXPLAINS THE RELATION OF ADVERSITY TO PAIN

Dr. Matthew Carlson Morris - Other
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Abstract

The tendency to ruminate about, magnify, and experience helplessness in the face of pain – referred to as pain catastrophizing – is a strong predictor of pain outcomes in healthy individuals. Although pain catastrophizing has been linked to adversity, the extent to which it accounts for relations between adversity and pain outcomes has received less attention. The ability to maintain positive physical and emotional functioning despite adversity – referred to as resilience – also influences pain outcomes. However, it remains unclear whether pain resilience accounts for positive pain outcomes following adversity. The present study included 152 healthy African-American adults (92 women), ages 18 to 45. Outcome measures included daily pain intensity (sensory, affective) and impact of pain on daily function (pain interference). Adversity measures included childhood trauma exposure, family adversity, chronic burden (past 6 months), and perceived stress (past month). A measure of lifetime racial discrimination was also included. Exploratory factor analysis of adversity measures yielded a two-factor (i.e., early adversity, recent adversity) solution. Bivariate correlations revealed that pain catastrophizing was positively correlated with adversity (both early and recent), racial discrimination, pain intensity, and pain interference. Pain resilience was negatively correlated with recent adversity (but not with early adversity or racial discrimination) and negatively correlated with pain intensity (but not with pain-related interference). Bootstrapped multiple mediation models revealed that the relationships between all adversity/discrimination and pain outcomes were mediated by pain catastrophizing. Pain resilience, however, was not a significant mediator in these models. The present findings highlight opportunities for early interventions to reduce risk for daily pain among African-American adults with greater adversity exposure by targeting pain catastrophizing.

Category: 2.0 - Behavioral and Social Determinants of Health - 2.03 - Pain Management - RESEARCH ABSTRACT

Grant Support: U54 MD007586 35

COMMUNITY MINI GRANTS RELATED TO SOCIAL DETERMINANTS OF HEALTH AFFECTED BY COVID-19 IN PUERTO RICO

Dr. Irene Lafarga Previdi - University of Puerto Rico Medical Sciences Campus
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Center for Collaborative Research in Health Disparities, UPR Medical Sciences Campus (ILP; AVG, CMVV, EFR) Junta Innovadora Comunitaria de Villa del Carmen (LM) Junta Comunitaria de Río Piedras (JP) Mujeres de Islas (DdR) Casa Juana Colón (JS)

Abstract

PURPOSE: The intention of this initiative is to support short-term strategies that reduce health disparities associated with the adverse effects of COVID-19 in Puerto Rico. Four community-based projects aimed at supporting communities to better face the consequences of the pandemic and its impact on the health of its members were subsidized for one year. DESIGN METHODS: A proposal call was shared via email with local community organizations. The evaluation criteria was:1.Relevance of the problem 2.Level of community involvement. 3.Anticipated impact of the project 4.Likelihood of project sustainability. In order to evaluate the projects, grantees were asked to submit a progress report (six months into the implementation). The areas to evaluate were: activities related to the objectives, number of participants impacted, opportunities and challenges. Monthly meetings were coordinated to provide ongoing support.RESULTS: The projects selected were:1)Community Health Coordinators Training project. They indicated that they have developed the curriculum and will recruit participants for training in the following six months. 2)Protection in Community Action project. They indicated that they were able to deliver protection materials to community members and impacted 30 people.3)Needs Health Assessment project. They indicated that they have recruited 175 participants and are in the process of coordinating data analysis.4) Wellness and Self-care Workshops project. They have indicated that they were able to coordinate the expected workshops and impacted 79 people in their community. Grantees have welcomed monthly meetings as they provided a space for sharing experiences and support to face challenges. DISCUSSION: These community grants have allowed to establish community-academic partnerships and support the communities so that they can adequately address the particular needs related to health disparities and COVID-19 that affect the populations with whom they work.

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

Grant Support: GRANT SUPPORT: This project is supported by 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.

BUILDING BIOBEHAVIORAL GOAL-DIRECTED RESILIENCE AMONG BLACK WOMEN

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Morehouse School of Medicine (SAR, KBH); Emory University (AP, ECL)

Abstract

PURPOSE: Post-traumatic stress disorder (PTSD) is an aberrant response to an actual or perceived life-threatening event and a risk factor for cardiovascular disease (CVD). PTSD has a prevalence of up to 60% among urban Black women. Our study, Building Biobehavioral Goal-Directed Resilience Among African American Women (Project GRIT), is a randomized controlled trial intended to improve mental health outcomes and reduce CVD risk in Black women with PTSD. Our central hypothesis is that development of resilience skills will promote and sustain goal-

directed engagement that replaces stimulus-based reactivity, improves PTSD symptoms, and reduces CVD risk. METHODS: Participants are randomized into an 8-week group intervention or a minimal attention control. All participants complete baseline, post-test, and follow-up mental health and neuropsychological tests. Participants in the Goal-Directed Resilience Intervention Training (GRIT) learn resilience skills for responding to and managing trauma or stress to live healthy, productive lives. Focus groups will elicit feedback on participants' intervention experiences and application of skills learned. RESULTS: Participants who completed the 8-week intervention have reported improvements in PTSD symptoms, resiliency, emotional regulation, psychosocial function, and sleep patterns compared to baseline. Participants in the control condition have not reported significant changes in symptomology. Preliminary results show promising directions for culturally appropriate interventions for Black women with PTSD. Additional data are forthcoming. CONCLUSION: A strengths-based, culturally relevant approach to PTSD management may help mitigate stress effects on CVD. This research is also illuminating gaps in treatment and best practices for empowering Black women while advancing the science of resilience by elucidating a bio-behavioral model. More research is needed to further elucidate long-term effects of resilience treatment for PTSD.

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

Grant Support: This project is supported by the National Institute of Minority Health and Health Disparities (NIMHD) Grant Number 2U54MD007602-31A1.

SOCIODEMOGRAPHIC CORRELATES AMONG ADULT SMOKERS IN PUERTO RICO WITH MENTAL ILLNESS AND CHRONIC DISEASES

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UNIVERSITY OF ROCHESTER (RHT, FCB, APC); PONCE HEALTH SCIENCES UNIVERSITY (PCC, ERS); Washington University in St. Louis (LJC)

Abstract

In Puerto Rico, two in ten adults aged 18 to 64 years old (18.7%) have a mental illness (MI). Compared to the general population, people with MI report higher rates of chronic health diseases (e.g., diabetes) and smoking. Seldom have associations between obesity, smoking, and chronic diseases have been examined among Puerto Ricans with MI. This study compared sociodemographic and health history characteristics among adult smokers and non-smokers with a MI in Puerto Rico. This cross-sectional study includes data from Puerto Rican adults (> 21 years) with a history of MI receiving psychiatric or psychological treatment in a community healthcare facility. Chi-square tests were used to compare differences in self-reported outcome variables by smoking status (smoking vs. non-smoking). Participants were adults with a history of MI (n=294) and 61.8% identified as women. More than half (64.2%) reported a history of multiple MI diagnoses with depression and anxiety being the most frequent. The majority of participants reported a history of chronic illness (74.5%), with asthma (24.1%), diabetes (25.9%) and hypertension (41.4%) being the most prevalent. BMI was above the recommended (27.2% overweight; 46.2% obese) and 25.2% reported being current smokers. There were significant associations between diabetes ($X2(4) = 12.331$, $p = .015$), hypertension ($X2(4) = 22.066$, $p < .001$), history of multiple health conditions ($X2(4) = 26.203$, $p < .001$) and BMI). There was also a significant association between history of multiple MI diagnoses and smoking ($X2(1) = 11.284$, $p < .001$). Non-significant associations were found between chronic diseases and smoking status ($p > .005$). Results confirm higher prevalence rates of current smoking and obesity among Puerto Ricans with a history of MI and its association with chronic health diseases. Our study supports the need for culturally adapted smoking cessation treatments for Puerto Ricans living with mental illnesses and chronic diseases.

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

Grant Support: Dr. Hernández-Torres is supported by the University of Rochester CTSA award number TL1 TR002000 from the National Center for Advancing Translational Sciences of the National Institutes of Health. Dr. Leopoldo J.

Cabassa is supported by the National Institute of Mental Health under awards R25MH 080916, T32MH019960, R01MH120597, R01MH115502 and P50MH115843 and the National Institute of Diabetes and Digestive and Kidney Diseases under award R25DK123008. Dr. Rivera-Segarra is supported by the National Institute on Minority Health and Health Disparities under award U54MD007579 and the National Institute of Mental Health under award R34MH120179.

SPATIAL EPIDEMIOLOGY OF CV-19 IN LA CO, CA. APR 20- JAN 21.

Dr. Paul Langham Robinson - Charles R. Drew University of Medicine and Science
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Charles R Drew University of Medicine and Science (PLR, SRC, SGB, DNR); University of California Los Angeles (PLR)

Abstract

PURPOSE To understand how the spatial epidemiology of pre-vaccine era COVID-19 was influenced by pre-existing social determinants of health, as the disease moved through local community areas in a large metropolitan county over the period April 2020 – January 2021. METHODS Daily adjusted (case, mortality, and testing) data for 348 community areas were used to model the spread of the COVID-19 pandemic through neighborhoods in Los Angeles County from April 2020 up to the beginning of vaccine distribution in January 2021. Geographic information systems and statistical analysis of the spatio-temporal progression of COVID-19 incidence and related mortality were used to analyze the influences of local social determinants of health on the spatial epidemiology of the disease and its outcomes. RESULTS / EXPECTED RESULTS The trajectory and magnitude of observed racial, ethnic and socio-economic disparities in both COVID-19 caseloads and related mortality were in part determined by localized concentrated employment in; vulnerable occupations, gaps in accessibility to local health resources, inadequate health messaging, population crowding, spatial segregation of population groups by race and ethnicity, differences in community SES, and other related factors. DISCUSSION / CONCLUSION In large US metropolitan areas such as Los Angeles County, disparities in which population groups were most severely impacted by the COVID-19 pandemic in the period before widespread availability of vaccines, were driven by localized socio-environmental forces that can be addressed via health and social policy actions and measures. The results of this research indicate that future inequities in the impact of disease pandemics can be prevented via pro-active planning to equalize access to health resources, prioritize the most susceptible groups and improve health communication across diverse populations.

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

PREVENTIVE MEASURES AMONG HEALTH CARE PROVIDERS DURING THE PANDEMIC

Mr. Robert Rodriguez-Gonzalez - Ponce Health Sciences University
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Abstract

COVID-19 placed health systems worldwide under immense pressure, and health care providers (HCPs) faced the pandemic in the front lines. In March 2020, the Department of Health confirmed the first cases of COVID-19 in Puerto Rico. The study's objective was to assess infection control practices among HCPs before vaccine availability. We carried out a descriptive cross-sectional study from July to December 2020 to evaluate personal protective equipment (PPE), hygiene guidelines, and other measures used by HCPs in public and private institutions to prevent the spread of SARS CoV-2. We also collected nasopharyngeal specimens for molecular testing at the beginning of the study and at follow-up.We recruited 62 participants; 21% were men, 79% were women between 30-59 years.

Participants included medical technologists (33%), nurses (28%), respiratory therapists (2%), physicians (11%), others (26%), divided between hospitals, clinical laboratories, and private practice. We identified that 87% followed the hygiene recommendation guidelines. HCPs were exposed to patients with COVID-19; 60% had a short exposure using PPE, 40% had prolonged exposure, 34% using approved PPE, and 6% non-approved PPE. In addition, we found that 84% used gowns, 82% used gloves, 95% used surgical masks, 42% used N95 masks, 84% used face shields. All participants practiced hand washing or disinfection before or after caring for each patient. No study participant tested positive for SARS-CoV-2 during the study period. On follow-up, all study participants were vaccinated against COVID-19. The implementation of PPE and hygiene measures showed high efficacy as a prevention method against SARS CoV-2 infection.

Category: 2.0 - Behavioral and Social Determinants of Health - 2.02 - Occupational Health - RESEARCH ABSTRACT

Grant Support: Puerto Rico Science and Technology Research Trust; National Institute of Minority Health and Health Disparities (U54MD007579).

CHILDREN'S SOCIOEMOTIONAL DEVELOPMENT AND NEIGHBORHOOD

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Abstract

PURPOSE A healthy socioemotional development is essential for children to cope and develop problem-solving skills. The social context in which a child is raised can determine their mental health development and wellness. This cross-sectional study examined associations between child's socioemotional development at 36- or 48-months-old and neighborhood perception in mothers with history of Zika virus infection during pregnancy. METHODS Fifty-six mothers answered the Ages and Stages Questionnaire: Social-Emotional (ASQ:SE-2) and the Perceived Neighborhood Scale (PNS). Participants' household location was used to obtain the Area Deprivation Index (ADI). Logistic regression was used to analyze the relationship between responses in the ASQ:SE-2 (no-risk/at-risk) and the PNS- Sense of Community scales (SC) (using Percentile 50 as a cut-off to categorize as low/high). RESULTS Fifty-eight percent of the mothers have low education (high school, technical certification or less), 71% had an income of <$15,000, and 90.7% receive government aid. Twenty-one percent of the children were at-risk of socioemotional development difficulties, and 83.9% of mothers reported high SC. The median of the ADI (7) indicates that most of these vulnerable families live in disadvantaged neighborhoods. Children whose mothers perceive higher levels of SC are 87% less likely (OR: 0.13, 95%CI 0.03-0.70) to be at-risk for socioemotional development difficulties than those children of mothers with lower SC levels, adjusting for maternal education, age, and household income. DISCUSSION In spite of growing up in a disadvantaged neighborhood, the sense of belonging, trust, and cohesion with the community appears to be a protective factor for children's socioemotional development. Pediatric health providers and policy makers should conceptualize the socioemotional health of children within the context of their neighborhoods where a family sense of belonging could exert a developmental support role.

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

Grant Support: NIH-NIMHD; Grant U54MD007579

SUCH A DAILY HASSLE: ASSOCIATIONS OF AFRICAN AMERICAN EMPLOYED PARENTS' DAILY INTERACTIONS WITH CHILD BEHAVIOR

Dr. Nina Smith - North Carolina Central University

NP Smith; Wells, JM; Howard, J; Taylor, LT; Iruka, I
North Carolina Central University; University of Pittsburgh; University of North Carolina at Chapel Hill

Abstract

Balancing the demands of work and family have become increasingly complex among families with young children in recent decades. African American families are especially susceptible to the impact of work demands, as this group tends to work longer hours and are often the racial minority in the work place. Such disparities have implications for daily family dynamics and the overall quality of life in African American households. Additionally, African American parents deal with other unanticipated stressors that may further impact healthy family functioning. While the relationship among employment and child well-being has been extensively explored, less is known about these associations in African American families. The present study seeks to test the associations among work demands, daily hassles, depressive symptoms, and young children's behavioral outcomes among a sample of African American families. Daily diaries were utilized over a two-week period in an effort to test the proposed associations. Results unearthed a negative association among daily hassles and child behavior (internalizing and externalizing). Moreover, depressive symptoms were negatively associated with parent-child interactions and children's internalizing behavior. Findings inform policies and practices aimed at understanding factors related to family well-being and assist in identifying mechanisms that protect and foster healthy development in African American families.

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

Grant Support: RCMI Grant U54MD012392

DISCRIMINATION, DISTRUST, AND COVID-19 VACCINE HESITANCY

Dr. Ingrid K Tulloch - Morgan State University
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Morgan State University

Abstract

PURPOSE The research examined the relationship between discrimination experiences, healthcare system distrust, and COVID-19 vaccine hesitancy across ethnic groups. We hypothesized that Lifetime Discrimination and Healthcare System Distrust would significantly predict COVID-19 vaccine hesitancy in a race or ethnicity-dependent manner. METHODS A community sample of participants completed the Daily Discrimination subscale of the Perceived Discrimination Scale to measure race-based microaggressions and other discriminatory experiences. Participants also completed the Health Care System Distrust Survey of opinions on health research and care providers, reported their vaccination plans, and provided demographic information on race, ethnicity, and gender. RESULTS Of the 59 participants, 76.3% were female, 23.7% male. Most were non-Hispanic Black or African American (72.9%), 18.6% were non-Hispanic White or European-American, and 8.5% identified as multiracial/multiethnic or "other." A greater proportion of non-Hispanic black or African Americans (51.16%) compared to multiethnic (20%) and non-Hispanic white or European American participants (27.27%) were covid-19 vaccine-hesitant. Participants of all ethnicities who planned to get the vaccine reported less distrust of the healthcare system, with a positive correlation between perceived discrimination and healthcare system distrust. Race predicted the average incidence of discrimination. Non-Hispanic blacks or African Americans and multiethnic participants reported the highest discrimination experiences, and Black males had the highest levels of health care system distrust. DISCUSSION/ CONCLUSION. These data suggest that COVID-19 vaccine hesitancy, mainly for African Americans, might be driven by distrust of the health care system and ethnic or racial discrimination experiences. Addressing COVID-19 vaccine hesitancy might require consideration of an individual's experiences with discrimination.

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

Grant Support: This research was supported by the NIH-NIGMS ASCEND BUILD Student Training Grant TL4GM118974 and NIH-RCMI Research Infrastructure Development Core Grant 1U54MD013376 01A1.

THE RELATIONSHIPS BETWEEN LIFETIME ABUSE, EMOTION REGULATION, COGNITIVE FUNCTION AND RISKY BEHAVIORS AMONG WOMEN AT RISK FOR HIV

Dr. Karina Villalba - Other
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Abstract

The relationships between lifetime abuse, emotion regulation and risk behaviors are well established; however, the relationship with executive function is not. The present study aimed to evidence on the indirect associations between executive function and emotion regulation on lifetime abuse and risk behaviors. We hypothesize that the bidirectional relationship between cognition and emotion significantly mediate the relationship between lifetime abuse and risk behaviors (i.e., alcohol abuse). Cross-sectional study analyzed the associations between lifetime abuse, emotional dysregulation, cognitive function, and alcohol use among 152 women at risk for HIV in Florida. Emotional dysregulation was measured with the Difficulties in Emotion Regulation Scale, cognitive functioning was measured with the NIH Toolbox, and hazardous alcohol use with the Alcohol Use Disorder Identification Test. Direct and indirect effects of lifetime abuse on risky behaviors through emotional dysregulation and cognitive function were measured using Process Macro v.4.0. The indirect effect (i.e., mediation) was tested using 10,000 resampling bias-corrected bootstrap. Mean age of the sample was 42 years (SD = 11), with the majority self-identifying as Black (47%) and Hispanic (54%). The results of the mediation model showed that both impaired executive function and emotion dysregulation fully mediated the relationship between lifetime abuse and hazardous alcohol use (indirect model = .07, SE .03, 95% CI = -.116 to - .004). The indirect effect of executive function via emotion dysregulation on the association between lifetime abuse and hazardous alcohol use is significant with the total effect accounting 18% for emotion dysregulation and 6% for executive function. Our findings suggest that the pathway between lifetime abuse and hazardous alcohol use is through executive function and emotion with both systems overlapping in the response to an external demand such as alcohol use.

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

Grant Support: National Institute of Minority Health and Health Disparities, RCMI Pilot Program.

RATES OF EMERGENCY NALOXONE DISTRIBUTION, FLORIDA, 2019-2020

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MK WARD; RR Rojas; T Gwanzura; MJ Trepka; Z Bursac; EF Wagner
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Abstract

PURPOSE: Social disruptions resulting from COVID-19, and the necessary measures to control its spread, may have contributed to increases in opioid-related overdoses. We assessed changes in nonfatal opioid overdoses during the onset of the COVID-19 pandemic. METHODS: Emergency medical service data was obtained from the Florida Department of Health. Administration of naloxone with documented improvement was used as a proxy for nonfatal opioid overdoses. Population denominators were derived from the 2019 5-year American Community Survey. Rates were estimated per 100,000 population for April-September 2019 and compared to the same period in 2020. State-wide rates were stratified by sex and examined by race/ethnicity. Rates were also analyzed by county categorizations, including urban/rural designation, quartiles of the number of facilities registered as offering medication for opioid use disorder (MOUD) in the Behavioral Health Treatment Locator as of March 2020, and quartiles of the percent change in unemployment from March to April 2020. RESULTS: Nonfatal opioid overdose rates increased for all groups,

increasing overall from 32.5 to 45.0 per 100,000. Rates among males and females increased by 19 and 6.3 per 100,000, respectively, increasing most among White males (+28.6), Black males (+12.2), and White females (+11.1). Among males, rates increased most in urban (+18.7) compared to rural counties (+10.6), while among females, rates increased most in rural (+9.2) compared to urban counties (+5.9). Counties with no treatment facilities offering MOUD services experienced an increase of 9.9 per 100,000 (+14.1 among males, +5.2 among females). Counties in the second quartile of unemployment change experienced an increase of 20.4 per 100,000. CONCLUSION: Our results emphasize the importance of ensuring access to substance use treatment during public health emergencies, as well as the importance of social safety nets to support individuals experiencing economic shocks.

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

Grant Support: This research was funded by the Research Center in Minority Institutions at Florida International University (U54MD012393), which is sponsored by the National Institute on Minority Health and Health Disparities (NIMHD). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health. We are grateful to the Florida Department of Health's Bureau of Emergency Medical Oversight for their assistance.

3.0 - CAPACITY BUILDING

ROLE OF BIOMEDICAL INFORMATICS TO REDUCE HEALTH DISPARITIES

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Charles R Drew University of Medicine and Science

Abstract

PURPOSE Addressing health disparities involves considerable data, including health information technology (HIT) to capture and analyze these data and to create interventions to improve outcomes. Biomedical informatics addresses uses of biomedical data to improve human health. A center for biomedical informatics, by combining education, research and HIT practice, can address health disparities. We review one such center as a case study. METHODS We review the interdisciplinary faculty and staff skill set, research activity, educational program, research infrastructure services and collaborations of the Charles Drew University (CDU) Center for Biomedical Informatics (CBI). RESULTS The skill set in the CDU CBI includes computer science, clinical medicine and quantitative/qualitative analytic methods. Research activity includes telehealth screening for diabetic retinopathy and machine learning to improve its treatment; clinical decision support to improve care of chronic diseases; sociotechnical studies to enhance provider effectiveness and patient engagement; the development of mHealth applications; and the development of HIT standards. The educational program includes contributing lectures to courses in other disciplines; mentoring medical student research projects; presenting informatics courses in other degree programs; and an informatics MS degree program. Research infrastructure services include data management tools such as REDCap and access to terminologies for coding. Collaborations include providers in a medically-underserved population and other research units in a center for translational science. DISCUSSION / CONCLUSION An academic center for biomedical informatics can address health disparities by bringing together 1) research activity and services that directly and indirectly address biomedical informatics; 2) collaborations that provide a multiplier effect from such efforts and 3) education that teaches trainees how to undertake such efforts.

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

Grant Support: NIMHD grant 2U54MD007598 from the US National Institutes of Health.

4.0 - CLINICAL AND TRANSLATIONAL MINORITY HEALTH AND HEALTH DISPARITIES RESEARCH

INHIBITION OF THE INTERACTION BETWEEN SEVERE ACUTE RESPIRATORY SYNDROME CORONAVIRUS 2 (SARS-COV-2) SPIKE PROTEIN'S C-TERMINAL C-END RULE (CENDR) REGION AND NEUROPILIN 1 RECEPTOR

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Texas Southern University (TA, MK, CO, AE, OO)

Abstract

PURPOSE: Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) the causative agent of Coronavirus disease 2019 (COVID-19), has resulted in over 6 million deaths worldwide. Although vaccines are currently available, mutations on the viral gene have increased infectivity and transmission. Remdesivir remains the only FDA-approved drug for COVID-19 patients. The potential emergence of vaccine and drug-resistant strains of SARS-CoV-2 has made it imperative to develop safe antivirals that target host receptors required for viral entry. Our research focuses on Neuropilin 1(NRP1), a critical host co-receptor for SARS-CoV-2 entry into human cells. Through a focused search for clinically approved drugs that have potent activity against SARS-CoV-2 infection, our lab discovered OJT009. Herein, we report the characterization of OJT009 as a potent inhibitor of the interaction between NRP1 receptor and SARS-CoV-2 spike protein c-terminal c-end rule (cendr) region. METHODS: Using a COVID-19 Spike-NRP1 binding assay, we characterized the binding affinity of NRP1 and SARS-CoV-2 Spike protein receptor complex in the presence of OJT009. RESULTS: For the first time, we discovered OJT009 as a novel and potent inhibitor of SARS-CoV-2 infection. Our findings reveal a new mode of action and molecular target for OJT009 and provide a novel pharmacophore for pre-clinical development of COVID-19 therapeutics. DISCUSSION: One of the essential entry pathways for SARS-CoV-2 is through the interaction between viral envelope-anchored spike glycoprotein of SARS-CoV-2 and the host receptor, angiotensin-converting enzyme 2(ACE2). This entry pathway is further enhanced through interaction between NRP1, and the C-end Rule (CendR) region of SARS-CoV-2 Spike protein. Inhibition of this SARS-CoV-2- Spike protein-NRP1 complex by OJT009 could prevent viral entry and be a potential Lead drug for Covid-19 drug development.

Category: 4.0 - Clinical and Translational 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.

NEIGHBORHOOD VULNERABILITY AND STRESS IN AFRICAN AMERICANS

Dr. Claudia Alberico - North Carolina Central University
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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) refers to the potential adverse effects caused by external stressors on human health. The aim of this study was to associate SVI 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. Participants' neighborhoods were identified by geocoding home address and SVI was attributed to their residence. Through laboratory assays, plasma levels of NPY and cortisol were measured. 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 ($p<.01$) and normal ($p=.045$) and overweight ($p<.01$) BMI strata. Cortisol showed to be negatively correlated to SVI overall ($p<.01$), also significant for females ($p<.01$) and those in the normal weight strata ($p=.021$). SVI was positively correlated with PS ($p=.009$), especially for obese participants ($p<.01$). 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 be focusing on the built and social environments to lower health disparities.

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

Grant Support: NIH U54MD012392

RETINAL PHOTORECEPTOR DIFFERENTIATION FROM HUMAN PLURIPOTENT STEM CELLS FOR EXOSOME-BASED DRUG DELIVERY

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Abstract

Retinal cells, including light-sensing photoreceptors, lack regeneration potential leading to permanent vision loss. Various approaches, including gene therapy, cell transplantation, and optogenetics, are being studied to treat or restore irreversible damage. Generating retinal photoreceptors or the derived extracellular vesicles using human pluripotent stem cells (iPSCs) holds great potential in treating and developing in vitro models to understand better and screen various formulations for retinal degenerative diseases such as age-related macular degeneration. In this study, human iPSC line (iPSK3 cells) derived from skin fibroblasts cells was differentiated into retinal photoreceptors following a small molecule-based retinal induction protocol, which includes Dual SAMD inhibitors SB431542 (10 µM) and LDN193189 (100 nM), Wnt inhibitor IWR1 (2 µM), and IGF (10 ng/mL) in Knockout Serum Replacement (SR, 10%) medium plus N1 supplement (1%). The maturation medium was used after day 10 with 0.5% fetal bovine serum plus 1% N1 supplement up to day 24-42 (3-6 weeks). The conditioned media were collected for extracellular vesicles (EV) or exosome isolation and characterizations. Retinal photoreceptors differentiated from the iPSCs showed marker expression for retinal progenitor cells (LHX2), ganglionic cells (PAX6), pan-photoreceptors (OTX2, CRX), and differentiated ganglionic cells (BRN3). Isolated EVs showed an average nanoparticle size range of 110-200 nm. The EVs also expressed the positive exosomal markers determined by western blot, including Alix, HSP70, CD63, HRS, Caveolin-1, and Flotillion-2, but not the negative marker Calnexin. Spent media from human-patient retinal organoids were used as the positive control. The isolated EVs can be loaded with Cannabidiol (CBD) to treat ocular diseases. This study provides evidence for recapitulation of the native retinal environment and the development of photoreceptor models for drug delivery studies to treat ocular diseases.

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 U54

3D PRINTED MICRONEEDLE PATCH AND ITS EVALUATION IN RATS

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Abstract

3D printing technology has been reported for MN production because of its numerous advantages such as increased efficiency, high-throughput processing, reproducibility and single step production. The objective of the present study was to develop and evaluate 3D printed microneedles (MNs) containing Lithium phenyl-2,4,6-trimethylbenzoylphosphinate (LAP) as a photoinitiator to deliver lipophilic active pharmaceutical ingredients (APIs) transdermally for 72 hours (hrs) using quality by design (QbD) and artificial intelligence (AI) algorithms. In the present study, dissolvable MN patch of ibuprofen (IBU) as a model drug was successfully fabricated using digital light projector (DLP) printing technology with ~750 µm height, ~250 µm base diameter and tip with radius of curvature (Roc) of ~15 µm. MN patches comprised of IBU, LAP, poly (ethylene glycol) dimethacrylate 550 (PEGDAMA 550) and distilled water were developed using QbD optimization approach and validating using AI and machine learning algorithms. Mechanical strength studies demonstrated that IBU MNs formed pores both on parafilm and human cadaver skin. IBU MNs consisting of 0.23% and 0.49% LAP with 10% water in each showed ~ 2mg/cm2 sustained drug permeation at the end of 72 hrs in vitro skin permeation testing studies (IVPT) with flux of ~ 20 µg/cm2/hr in first 24 hrs. Further, pharmacokinetic (PK) studies conducted in rats for 48 hrs showed ~ 62812.02 □ 11128.39 (ng/ml*hr) of AUC (0-48hr), 2.66 □ 1.12 h of Tmax and 3717.43 □ 782.25(ng/ml) of Cmax from the IBU MN patch containing 0.23% LAP with no significant difference compared to the patch containing 0.49% LAP. In conclusion, in the current study, biocompatible dissolvable IBU MN patch was successfully fabricated using DLP printing technology to deliver lipophilic API in a sustained manner for 72 hrs.

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: The research was supported by the National Institute on Minority Health and Health Disparities of National Institutes of Health under Award number U54 MD007582 (U54 RCMI grant) and NSF-CREST Center for Complex Materials Design for Multidimensional Additive Processing (CoManD) award # 1735968.

CLASS II PHOSPHATIDYLINOSITOL-3-KINASES PROMOTES CCR7 RECYCLING TO THE CELL MEMBRANE IN HUMAN T-CELLS

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Abstract

C-C Chemokine Receptor 7 (CCR7) and its ligands (CCL19 and CCL21) are important for immune cell migration/co-localization during the primary and subsequent immune responses. We have previously shown both in humans and in mice that signaling through CCR7/CCL19 promotes rapid receptor internalization via arrestin-3. Therefore, we questioned whether internalized CCR7/CCL19 recycles to the membrane in T-cells, and if so, what are the drivers for recycling. G protein-coupled receptors can activate phosphatidylinositol-3-kinase (PI3K) family members to regulate membrane remodeling events, which include receptor recycling to the cell surface. To better understand the role of PI3K in the recycling of CCR7, we used wortmannin at 5µM to block class I and class II PI3K's and at 0.5µM to block class II PI3K during CCR7 recycling. We found that under both conditions, receptor recycling was reduced by 20% suggesting a role for PI3K family members in recycling of CCR7 to the cell membrane. Treatment of the cells with the class I δ specific inhibitor, GS-1101, however, did not affect recycling, suggesting that CCR7/CCL19 recycling to the cell membrane is dependent on class II PI3K. To determine the site within the cells where CCR7 was retained following inhibition of only class II PI3K, we used HEK-293 cells transfected with CCR7-eGFP and the trans-Golgi network (TGN) marker, TPST2-mCherry, ± 1µM wortmannin, which is required to inhibit class II PI3K in HEK-293 cells. We found that after receptor internalization with CCL19 and 30 minutes of recycling, CCR7-eGFP remained within the TGN in the presence of wortmannin, in contrast CCR7-eGFP, which recycled to the cell membrane in the absence of wortmannin, demonstrating a role for class II PI3K in CCR7 recycling.

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

Grant Support: NIH-SC1GM111172; NIH-2U54MD007592; NSF-HRD-182675; NIH-5UL1GM118970

GRAPHENE OXIDE DISRUPTS ADRENAL GLAND HOMOLOG OF JAPANESE MEDAKA

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Abstract

PURPOSE: Due to its unique physico-chemical properties and wide biomedical and environmental applications, graphene oxide (GO) released in the aquatic ecosystem has a great potential to negatively impact aquatic life. Using Japanese medaka (Oryzias latipes) fish as a test model, we previously demonstrated that GO exerted endocrine disrupting effects in fish targeting their reproductive organs (testis and ovary), and thyroid glands. In the present study we have investigated the interrenal (IR)-axis (adrenal homolog), as a potential target of endocrine disruption induced by GO. METHODS: Breeding pairs of reproductively active adult male and female medaka were exposed to 0 mg/l (control) or 20 mg/L GO by continuous immersion (IMR) for 96h, or to 0 µg/g or 100 µg/g GO by intraperitoneal (IP) administration. Also, 1 d post-hatch (dph) medaka larvae were exposed to different concentrations (2.5-20 mg/L) of GO for 96h. The IR axis was immunohistochemically evaluated in survived fish after 21 days depuration in a GO-free environment for adults and 6 weeks for larvae. As the IR axis of medaka is not a discrete organ, for quantitative analysis, we have counted IR-axis cells as deep-stained (DSN) and pale-stained nuclei (PSN) and compared within the experimental fish. RESULTS: Immunohistochemical study indicated that the IR-axis is distributed adjacent to the posterior cardinal vein and its branches within the head kidney. Columnar or oval shaped immunopositive/ and negative cells, arranged either in a single, or in groups, sometimes encircling a sinusoid, or in a straight chord, are adjacent to the endothelium of the cardinal vein. Hematoxylin/eosin staining indicated eosinophilic cytoplasm with round or oval basophilic nucleus. Histochemically, the cells are PAS negative. CONCLUSION: Our data indicate that GO-induced impairments of IR-axis in medaka fish are nonspecific, and are modulated by factors such as exposure route, sex, and age of the fish.

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

Grant Support: Research supported by NIH/NIMHD grant #1U54MD015929 (RCMI Center for Health Disparities Research) and NSF grant #HRD 1547754 (CREST Center for Nanotoxicity Studies).

GENOME-WIDE ASSOCIATION STUDY OF CLOPIDOGREL IN HISPANICS

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University of Puerto Rico Medical Sciences Campus (JD, PG, KC, MMP, EGG, KM, JYR, HN, AFG, ARL)

Abstract

PURPOSE. High on-treatment platelet reactivity (HTPR) with clopidogrel is predictive of ischemic events in adults with coronary artery disease. Despite strong data suggesting HTPR varies with ethnicity, clinical and genetics, no genome-wide association study (GWAS) of clopidogrel has been performed in Caribbean Hispanics. This study was aimed to identify genetic predictors of HTPR in a cohort of cardiovascular patients from Puerto Rico. METHODS. A GWAS was conducted in 511 patients on clopidogrel, separated into responders (no-HTPR, controls) and non-responders (HTPR, cases). Clinical data were obtained from medical records. Platelet function was measured by

VerifyNow® P2Y12 assays and HTPR was defined as P2Y12 reaction units (PRU) ≥208. The genome-wide screening was performed using the Illumina MEGA-chip array. Plink was used to test for associations and LD analyses. An ancestry-adjusted, weighted polygenic risk score (wPGxRS) was developed to account for the effect of multiple variants on PRU and compare cases versus controls. RESULTS. 34% of patients showed HTPR (mean PRU: 174±68.5). The top two GWAS hits were mapped to an intergenic region on chromosome 17 (rs4021557G>C) next to a gene encoding Potassium Inwardly-rectifying Channel Subfamily J Member 12 and missense variant rs200599378G>A within the Solute Carrier Family 19 Member 1 gene on chromosome 21. Manhattan plot showed nominal associations (p<10-6) between the CYP2C cluster at chromosome 10 (e.g., rs12777823; OR=2.4) and resistance in the discovery cohort. Pairwise analysis of identified variants showed strong LD of SNPs at this cluster with CYP2C19*2 (D'>0.9; r2>0.8). wPGxRS (five variants) discriminated between non-responders and responders (p=0.003), indicating it is a useful predictor of clopidogrel resistance among Caribbean Hispanics. CONCLUSION. This is the first GWAS of clopidogrel in Hispanics, confirming the relevance of the CYP2C cluster and identifying novel markers in a diverse population.

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 was supported by award # U54 MD007600 from NIMHD, NIH (CCRHD/ RCMI Program).

QUANTITATIVE DETERMINATION OF MYCOPHENOLATE AND ITS GLUCURONIDES IN BIOLOGICAL SAMPLES USING A NOVEL LC-MS/MS METHOD.

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Texas Southern University

Abstract

Purpose: During oral administration of mycophenolate, it is metabolized in the liver to its active metabolite mycophenolic acid (MPA) which is further metabolized to its glucuronides acyl mycophenolic acid glucuronide (AcMPAG) and mycophenolic acid glucuronide (MPAG). An analytical method was developed and validated for the quantitative determination of mycophenolate, MPA, AcMPAG, and MPAG in rat plasma. Method: A Shimadzu UHPLC system coupled to an AB Sciex QTrap 4000 mass spectrometer was used for the analysis. Separation was achieved using an Ultra Biphenyl 5µm column (100 × 2.1mm) with acetonitrile and 0.1% formic acid as the mobile phases. Analysis was performed under positive ionization mode using the multiple reaction monitoring (MRM) approach. Result: The method was linear in the range of 9.77nM – 5000nM with correlation coefficient values > 0.99 for all components. The method has been shown to be reproducible, with intra- and inter-day accuracy and precision ±12.3% of nominal values, for all analytes. The average extraction recovery rates for mycophenolate, MPA, AcMPAG, and MPAG were 91.3%, 97.9%, 98.4%, and 90.5%, respectively. Matrix effect was in the acceptable range (<15%). The analytes in plasma were found to be stable under bench –top, freeze-thaw, and storage (-4°C) conditions. Conclusion: This method can comprehensively evaluate and quantify the concentration of both mycophenolate and its glucuronides in biological samples. This method can be used as a tool to further investigate and understand the extensive metabolism of mycophenolate in clinical practice.

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

MOVING MOREHOUSE SCHOOL OF MEDICINE TRANSLATION TX RESEARCH THROUGH MDTTS - MULTIDISCIPLINARY TRANSLATIONAL TEAMS

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RC HOLLIDAY; TH Akintobi; KD Piper; SX Trimble; AK Mitchell; VC Bond; VD Floyd
MSM - Morehouse School of Medicine (RCH, THA, KDP, SXT, AKM, VCB, VDF)

Abstract

PURPOSE: To understand the role that expanded multidisciplinary team science plays in increasing the journey from basic science and public health research to patient therapies and community interventions. Hypothesis – Expanded teams that include basic, clinical and public health scientists, community partners, and learners facilitate the translation of basic research to community interventions Objectives - The identification of MDTTs that function in MSM and the evaluation of formation, composition, functioning, successes, failures, and sustainability. Goals: • To identify 'in progress' MDTTs and provide assistance and encouragement to move teams to 'full' MDTTs • To build internal consensus among MSM faculty, students, staff, and community partners of the importance of team science in reaching our vision of achieving health equity. METHODS: A MSM faculty member was selected as MDTT champion to lead this work throughout the institution. An MDTT workgroup was formed to collect information and data through key informant interviews, review of research documents, workshops, and community events. A school-wide MDTT 5 question survey will be conducted in April 2022 to ascertain faculty conducting Tx research and utilizing the MDTT process. RESULTS: Our scan has identified 16 teams that meet our definition of an MDTT which includes both learners and community partners. These team workgroups cross multiple departments including basic science, clinical and public health. Community partners include faith organizations, women's groups, legal consortiums, global advocates, community health workers groups, and journalists. A SQL database will host the MDTT collection and be utilized in our evaluation component. DISCUSSION: We believe that utilizing this expanded team science MDTT model allows us to increase the rapid translation of research discoveries to improve the health of minority and underserved populations and disadvantaged communities.

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

Grant Support: NIH NIMHD Award# U54MD007602

KEY BIOLOGICAL PATHWAYS OF DIABETES IN AFRICAN AMERICANS

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Howard University, USA (SG, TM, JS, GNB, SC, GM, RQ, CDH); Georgetown University, USA (CAL, BK)

Abstract

PURPOSE African American (AA) in USA faces multiple health complications due to high level of Type 2 Diabetes (T2DM) and is a true example of health disparities among the races. The aim of this study to undertake a comprehensive analysis of gene expression and the key biological pathways from the individuals diagnosed with diabetes. METHODS Global gene expressions for transcriptional changes (Clariom-S Array, Life Technologies, USA) were preformed coupled with Ingenuity Pathway Analysis (IPA) in the diabetes people compared to healthy controls (n=6 in each group) from AA population residents of Washington DC recruited through Howard University Hospital. Linear regression plot analysis was carried out to find the relationship between who the gene expression varied with the individual's diabetes condition (HbA1c % level) RESULTS The pathway analysis on the differentially expressed genes (n=1711, p value <0.05) reveal important top canonical pathways (p value <0.0001) in the population. The central molecules in that pathways correlates well in the individual's gene expression regression analysis between fold change and HbA1c%, viz., Insulin Receptor signaling Pathways (synthesis of carbohydrate, lipid, and protein, INSR, ≤0.0184), Xenobiotic Metabolism (ARNT, ≤0.031), transcriptional inflammatory response pathways (IL6, ≤0.009), Molecular Mechanism of Cancers (TP53, ≤0.027; BCL2, ≤0.028); cholesterol biosynthesis pathways (APOC1, ≤ 0.012) which showed inhibition (down-regulated) as HbA1c% increases corroborating previous observation. DISCUSSION These results fill the knowledge gap with an improved understanding of dysregulated gene expression associated with diabetes in African Americans. The outcome of the current results will help us to understand pathogenic mechanisms and identify disease risks in this vulnerable population complementing the minority health and disparity problem and community-driven solutions to promote health equity.

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: U54 (MD007597-31-5959) from NIMHD, USA.

EXPLORING THE ROLE OF DND1 IN SOMATIC CANCERS

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Abstract

PURPOSE: Dead-End (DND1) is an RNA-binding protein involved in translational regulation. Defects in DND1 gene causes germ cell tumors and sterility in rodents. Our previous in-silico analysis of DND1 showed that it is altered in many human cancers and in some cases with worse survival. DND1 either positively or conversely co-expressed with many genes in a variety of cancers. The Ingenuity Pathway Analysis (IPA) of these co-expressed genes identified many canonical signaling pathways in each cancer type, whose activation or deactivation are significantly associated with DND1 expression. Importantly, some cancers exhibit strikingly similar profiles of DND1-correlated signaling pathway activation or suppression. In this study, our goal is to experimentally verify the effects of DND1 on identified signaling pathways. METHODS: For our study, we cloned FLAG-tagged-DND1 ORF into a pLVX-TetOne-Puro vector. The modified vector was then subjected to sequencing to verify the gene insertion and replicated using Lenti-X packaging single shots (VSV-G) in HEK293T. The lentivirus produced will be used to establish a stable cell line that overexpress DND1 upon induction. The stable cell lines will further be used to examine the cellular features and the signaling pathways, at both RNA and protein levels, upon DND1 overexpression using RT-qPCR, Western Blot assay and/or RNA sequencing. RESULTS/EXPECTED RESULTS: The cloned gene was successfully transfected with a titer value of 3.6x106–3.6x107 IFUs/ml. Using this, a stable cell line will be established which can inducibly overexpress DND1. We expect that upon DND1 overexpression, these cells will exhibit a change of cellular features and at least some of the signaling pathways suggested by our in silico study will be affected. DISCUSSION/CONCLUSION: Our results would help us understand the role of DND1 in cancers. The inducible cell lines generated might be an essential tool to study the functional role of DND1.

Category: 4.0 - Clinical and Translational Minority Health and Health Disparities Research - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

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

PGX-GUIDED ALGORITHM TO REDUCE MACES IN HISPANIC PATIENTS

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University of Puerto Rico Medical Sciences Campus (EGG, MMP, ES, HN, AG, LT, JYR, JD); The Hispanic Alliance for Clinical & Translational Research (LG)

Abstract

PURPOSE: Clopidogrel is prescribed to prevent ischemic events in patients undergoing Percutaneous Coronary Intervention (PCI). However, genetics, demographics, and clinical variables can affect clopidogrel response leading to poor health outcomes. To reduce the incidence of major adverse cardiovascular events (MACEs), we aimed to validate a pharmacogenomics (PGx)-guided clinical decision support tool (CDS) designed to make actionable recommendations about the best treatment option in each patient. METHODS: Blood samples were collected from consented participants and platelet reactivity tests were performed to identify poor responders (platelet reactivity units, PRU≥230) using VerifyNow® P2Y12 assays. Individual CYP2C19*2 and PON1 rs662 genotyping were

determined using StepOne TaqMan SNP assays. Risk scores were calculated using the CDS tool. Follow-up calls were made at 1,3,6 months after recruitment to record any treatment-related MACEs occurrence. For statistical analysis, chi squared tests were performed. Protocol is approved by the Institutional Review Board (A4070417). RESULTS: Preliminary results show that the incidence rates of MACEs and bleeding events in the standard of care and the pharmacogenomic-guided groups were 0.40 and 0.28, respectively. The unadjusted odds ratio (OR) for the association between adverse outcomes and treatments at 6 months is 1.71 (95%CI: 0.85-3.51, p=0.064), suggesting that the odds of experience a MACE and bleeding seems to be around 2 times higher in patients whose antiplatelet therapy is guided by the standard of care versus those guided by genetics. Patients who carried a larger number of alleles that correlated with increased PRU were significantly more likely to experience MACE (OR: 3.0, p= 0.04). CONCLUSION: Preliminarily, the implementation of this PGx-guided algorithm reduce MACEs and improve health outcomes in Caribbean Hispanic patients.

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 was supported by grants from NIMHD-RCMI Program # U54 MD007600 and NIGMS-RISE R25 GM061838.

DISPARITIES IN COVID-19 PATHOGENESIS AND LONG-TERM OUTCOMES

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University of California, Riverside, School of Medicine, Division of Biomedical Sciences (ECH, MGN, MK, AG), Riverside University Health System (MU), University of California, Riverside, School of Medicine, Internal Medicine (PM)

Abstract

PURPOSE: COVID-19 has had a disproportionate impact on Hispanic/Latino populations in the United States. Nationwide, the relative mortality risk is higher in this population compared to non-Latino groups. We are examining this disparity in Inland Southern California (>50% Hispanic or Latino). Our objective is to determine how occupational circumstances and underlying comorbidities disproportionately impact outcomes in this community. We hypothesized that COVID-19 outcomes would be poorer in Latino populations due, in part, to higher prevalence of comorbidities which exacerbate the inflammatory response, or occupational or environmental exposures which impair lung function. METHODS: We are recruiting patients with mild (outpatient) or moderate to severe (ICU) COVID-19. Blood and nasal swab samples are collected for measures of immune function, inflammatory status, viral burden, and viral variants. We also determine comorbidity status, occupation, and demographics. Surviving patients return for measures of lung and immune health 12-18 months after recovery. We employ several levels of community engagement including continuous one-on-one communication with patients to share results and gather feedback. RESULTS: Currently, we have recruited 31 patients requiring intensive care (88% Hispanic) and 27 patients with mild cases (27% Hispanic). High-exposure risk occupations were rare among this cohort, and we do not see significant differences in mortality rates across Hispanic and non-Hispanic white populations, although with our modest sample size this may not yet be apparent. However, hypertension was very common in ICU patients (>70%), and diabetes was significantly more common in ICU patients who did not survive. DISCUSSION: Our findings support our hypothesis that diabetes and hypertension worsen COVID-19 outcomes. We are expanding our recruitment and conducting follow-up measures to examine differences in long-term health impacts across demographic groups.

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 was supported by a U54 subaward from The Center for Health Disparities Research at UCR

A NOVEL LEAD COMPOUND FOR ADVANCED PROSTATE CANCER

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Abstract

PURPOSE: Metastatic, castration-resistant prostate cancer (mCRPC) directly contributes to the mortality and morbidity of prostate cancer. It is an urgent and unmet medical need to identify new therapeutic targets and develop novel targeting strategies against lethal mCRPC. METHODS: We developed a novel small-molecule compound (GH5010 via a “molecular hybridization” approach. The in vitro cytotoxicity of GH501 was evaluated at the National Cancer Institute Developmental Therapeutics Program. The mechanism of action of GH501 was investigated using in silico docking, bio-layer interferometry (BLI) assay, and molecular and cellular approaches. The in vivo toxicity and anticancer efficacy of GH501 against mCRPC were evaluated in animal models. RESULTS: We demonstrated that GH501 exhibits potent cytotoxicity against mCRPC cells and induces apoptosis at nanomolar concentrations in a broad spectrum of human cancer cells. Mechanistically, GH501 disrupts the physical interaction between Skp1 and F-Box proteins (FBPs) and affects multiple Skp, Cullin, F-box containing complex (SCF) oncogenic signaling components implicated in the progression of mCRPC, including Skp2, β-catenin, EZH2, c-Myc, cyclin D1, RUNX2, survivin, p21 and p27. Significantly, GH501 suppresses the skeletal and subcutaneous growth of mCRPC in cell- and patient-derived xenograft models. CONCLUSION: These results indicated that pharmacological targeting Skp1-FBP interaction represents a promising therapeutic strategy for mCRPC. Considering the higher mortality and morbidity of prostate cancer in African Americans (AA) compared with other racial populations, we are evaluating the capacity of GH501 against mCRPC in representative models of AA prostate cancer.

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: Research Centers in Minority Institutions (RCMI) Investigator Development Grant (5U54MD007590-34, Project 8340; X Li); Georgia Research Alliance VentureLab grant, National Cancer Institute grants 1R41CA217491-01A1, 2R42CA217491-02A1, Emory University Winship Cancer Institute-Roswell Country Club Prostate Cancer Research Award, and the Department of Education Title III Program at Clark Atlanta University (D Wu).

THE ROLE OF HEALTH CARE PROVIDERS IN UPTAKE OF INFLUENZA VACCINE AMONG UNDERSERVED LATINX OLDER ADULTS

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Abstract

Background: Vaccination is a powerful tool in the fight against seasonal influenza among older adults. Yet, vaccine hesitancy and inconsistent uptake among underserved Latinx older adults remains a substantial challenge to public health. Methods: In this cross-sectional survey, we explore correlates of influenza vaccination uptake among underserved, Latinx, older adults. Our focus was the role of socio-demographics, living arrangements, financial strain, access and satisfaction with medical care, and the presence of chronic conditions in terms of vaccine uptake. Middle-aged and older Latinx residents diagnosed with diabetes and/or hypertension (n=165), were recruited from the South Los Angeles Service Plan Area, a historically under-resourced community. Multi-variate logistical regression were

performed. Results: Only 45% of Latinx older adults in our study reported influenza vaccination within 12 months prior to the study. Most (~85%) reported receiving this recommendation from their primary care provider. However, 30% of those receiving this advice did not get the vaccine. A decreased likelihood of vaccination was significantly associated with living alone (p=0.026), lacking Medicare coverage (0.028), or higher levels of financial strain (0.020). Difficulty accessing medical care (p=0.008) or dissatisfaction with these experiences (p=0.001) were also strongly associated with decreased likelihood of vaccination. Participants diagnosed with COPD had 9.5 (CI: 1.76 – 51.3) higher odds of being vaccinated compared to those without; no correlation was detected for other chronic conditions. Conclusion: The high number of unvaccinated Latinx participants who received a vaccine recommendation from a provider is consistent with studies among other ethnic/racial minority older adults. Findings highlight the pivotal role of the provider in influenza vaccine adoption and persistent negative impact of Social Determinates of Health on preventive care efforts in this group.

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 was supported by the Centers for Medicare and Medicaid Services (CMS) grant 1H0CMS331621 to Charles R. Drew University of Medicine and Science (PI: M. Bazargan). Additionally, Drs. Cobb and Adrienne Martinez-Hollingsworth were supported by the National Institutes of Health (NIMHD) under awards R25 MD007610 (PI: M. Bazargan).

DIET QUALITY AND VAGINAL MICROBIAL DIVERSITY IN PREGNANCY

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Abstract

PURPOSE: Understanding environmental influences on the vaginal microbiome may help improve pregnancy outcomes. While some dietary patterns are associated with improved vaginal microbial health, few studies investigate the impact of diet quality on this outcome. Our study associates Diet Quality as defined by the Healthy Eating Index (HEI) with alpha diversity metrics across pregnancy in healthy, low-risk pregnant women. METHODS: Women from the 4 largest ethnic groups in Hawai'i were recruited – Native Hawaiian, Filipino, Japanese and Non-Hispanic White. Diet Quality indices were assigned from Food Frequency Questionnaires at each trimester. Vaginal swabs were collected concomitantly at each time point, from which DNA extraction and 16s rRNA sequencing were performed. Alpha and beta diversity profiles were assigned, and linearly correlated with HEI Score, along with linear regression models to account for confounding demographic factors. RESULTS: Longitudinal data was available for 35 participants. HEI was stable across pregnancy, and correlated with alpha diversity metrics during the 1st trimester. Diet quality did not impact richness or evenness during the 2nd or 3rd trimester. There were no differences between ethnicities, weight class, or pregnancy outcomes. 4 Community State Types predominated: Lactobacillus iners, Lactobacillus crispatus, Lactobacillus gasseri, and lactobacillus deficient/mixed anaerobes predominant), and were evenly distributed among four quartiles of HEI scores. Overall there was apaucity of the Lactobacillus jensenii species. CONCLUSION: Vaginal microbiome of Asian and Pacific Islander women is underrepresented in literature. We document alpha diversity in this cohort decreased throughout pregnancy, commensurate with other studies. Diet quality was most associated with microbial composition in the first trimester, but likely has lesser impact on microbial transition than hormonal factors as pregnancy progresses.

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

Grant Support: This project was funded by the OLA Hawaii Project, is which supported by a grant from the National Institute on Minority Health and Health Disparities (U54MD007601), as well as the Sharma Foundation.

3D PRINTED TABLETS AND IT'S PHARMACOKINETIC EVALUATION IN RATS

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Abstract

The application of Three-dimensional (3D) printing for manufacturing tablets has recently been explored because of its wide application in personalized medicine. The objective of the present study was to develop ibuprofen tablets using Digital Light Processing (DLP) 3D printing and evaluating them via in vivo pharmacokinetic studies in rats. In this study, the resin formulation and printing parameters were first optimized using the MicroDLP 3D printer and applied to the Phrozen Sonic 4k 3D printer. The results indicated that the resin formulation consisting of 70% w/w polyethylene glycol MW 700 (PEGDA 700), 30% w/w distilled water, 10% w/w ibuprofen, and 0.01% w/w riboflavin printed with 40 second bottom exposure time and 30 second exposure time produced desired tablets on both Phrozen and MicroDLP printers. Further, phrozen tablets showed a tensile strength of 3.058 ± 0.155 MPa and 2.022 ± 1.453 % weight variation whereas, microDLP tablets had a tensile strength of 2.765 ± 0.075 MPa and weight variation of 1.768 ± 0.988%. Phrozen printed tablets showed higher drug release of 79% as compared to microDLP printed tablets which showed 67% drug release at the end of 25 hours in vitro drug release study. In vivo pharmacokinetic study in rats showed Cmax of 30.124 ug/ml, Tmax of 2 hours, with significantly high AUC(0-24hrs) of 318.97 (ug/ml*hr) in case of Phrozen 3D printed tablets as compared to control (marketed Advil tablets) which showed Cmax of 66.56 ug/mL, Tmax of 2 hours, and AUC(0-24hrs) of 9.715 (ug/ml*hr). In conclusion, 3D printing technology can be used to manufacture solid oral dosage forms for personalized mediations.

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: The research was supported by the National Institute on Minority Health and Health Disparities of National Institutes of Health under Award number U54 MD007582 (U54 RCMI grant) and NSF-CREST Center for Complex Materials Design for Multidimensional Additive Processing (CoManD) award # 1735968.

HEALTH-RELATED TOPICS INTEREST TO UNDERREPRESENTED MINORITIES (URMS) IN THE GREATER HOUSTON COMMUNITY

Dr. Uche Anadu Ndefo - Texas Southern University
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Texas Southern University

Abstract

Background Texas Southern University (TSU) has a long history of implementing community engagement outreach efforts addressing health disparities through established partnerships and collaborations with healthcare systems, Federally Qualified Health Centers (FQHCs), and community-based organizations (CBOs). The Community Engagement Core (CEC) within the Center for Biomedical Minority Health Research (CBMHR) leverages partnerships and collaborations to identify the health-related concerns of the underrepresented minorities (URMs) and provide education on the topics identified. Methods Initially, monthly seminars were based on various topics identified by the CEC staff from the literature. Each month, different experts in the community present on the identified topic, usually paired with a healthy lifestyle activity such as exercise or healthy cooking tips. At the conclusion of each monthly seminar, participants are invited to complete a survey where they are asked what topics they would be interested in learning more about. Results The survey was distributed over a 2-year period with 165 responses. Participants were provided with the following options and provided with the option to write in any topic of their choice. The top 5 most commonly requested health topics were cancer (combination of breast, colon, prostate, and lung cancer - 17.6%), mental health (16.4%), hypertension (13.9%), diabetes (13.3%), and exercise, nutrition, and weight management. Conclusion Underrepresented minorities in the Greater Houston Area are interested in learning

more on prevention of various cancers. Chronic diseases continue to be a concern on how to prevent and manage these disease states which may be attributable to the disproportionate number of underrepresented minorities affected by these disease states. The CEC will tailor its' programming in the upcoming years to provide the education requested by the community.

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

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THE EFFECT OF CONTROLLED GASTRIC ACID SECRETION ON THE BIOAVAILABILITY OF OJT007

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Texas Southern University (MERN, JM, MK, HX, OAO, DL)

Abstract

OJT007 is a novel drug class with potent antiproliferative effects against Leishmania Major. Studies from our group have determined that OJT007 has low oral bioavailability due to pre-systemic metabolism. Nonetheless, the varied pH conditions through the gastrointestinal tract may reduce the oral bioavailability for drugs with pH-dependent stability. Thus, we hypothesize that drug degradation under acidic conditions may contribute towards OJT007 low oral bioavailability. This study aimed to determine the effect of acid stability on the oral bioavailability of OJT007 in vitro and in vivo. We evaluated in vitro the stability by incubating OJT007 in buffers (pH 1.2-10) at 37oC. We further validated the in vitro findings by evaluating the effect of controlled gastric conditions in rats by using the proton pump inhibitor rabeprazole to increase gastric pH in the stomach. A crossover study design was used for the in vivo studies. The in vitro degradation was rapid at pH 1.2-3, and by 0.5 hours, 50% or less remained of the drug. There is a clear relation between pH and drug stability: the lower the pH, the higher the degradation. Following pretreatment with rabeprazole, significant reductions in Cmax and AUC0-∞ of approximately 40% were observed compared to OJT007 alone. OJT007 exhibited poor stability at acidic pH. We hypothesize that this is caused due to OJT007 containing an imine functional group that could be prone to acid-catalyzed hydrolysis. These results suggest that OJT007 could be unstable on stomach pH. Nonetheless, increasing gastric pH did not increase exposure, possibly due to low solubility of OJT007 at high gastric pH. In summary, low oral bioavailability for OJT007 is not significantly due to acid degradation but due to low solubility. Further studies are required to confirm what mechanism drives the decreased exposure.

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 supported by the National Institute on Minority Health and Health Disparities of the National Institute of Health under award number U54MD007605.

CHARACTERIZATION OF OJT008 AS A NOVEL INHIBITOR OF MYCOBACTERIUM TUBERCULOSIS

Mr. Collins Chidi Onyenaka - Texas Southern University
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Texas Southern University, Houston (CCO; KI; DL; OAO)

Abstract

PURPOSE Despite recent progress in the diagnosis of Tuberculosis (TB), the chemotherapeutic management of TB is still challenging. Mycobacterium tuberculosis (Mtb) is the etiological agent of TB, and TB is classified as the 13th leading cause of death globally. Our study is focused on inhibiting Methionine Aminopeptidase (MetAP), an essential protein for the viability of Mtb. MetAP is a metalloprotease that catalyzes the excision of N-terminal methionine during protein synthesis. This essential role of MetAPs makes this enzyme an auspicious target for the development of novel therapeutic agents for the treatment of TB. Mtb possesses two MetAP1 isoforms, which are vital for Mtb viability, hence a promising chemotherapeutic target for Mtb infection. METHOD Recombinant MtMetAP1c was cloned, overexpressed and we investigated the in vitro inhibitory effect of OJT008 against ions activated MtMetAP1c. RESULTS/ EXPECTED RESULTS The induction of the overexpressed recombinant MtMetAP1c was optimized at 8 hours with a final concentration of 1mM Isopropyl β-D-1-thiogalactopyranoside. The average yield for MtMetAP1c was 4.65mg mg/L of Escherichia coli culture. Preliminary MtMetAP1c metal dependency screen showed optimum activation with nickel and cobalt ions at 100µM. The half maximal inhibitory concentration values of OJT008 against MtMetAP1c activated with CoCl2 and NiCl2 were in the micromolar range. Our in-silico study showed OJT008 strongly binds to both metals activated MtMetAP1c, as evidenced by molecular interactions and higher docking scores thereby corroborating the in vitro result. Thus, validating the pharmacophore's metal specificity. DISCUSSION/CONCLUSION The potency of OJT008 against both active and MDR Mtb were in the low micromolar concentrations, correlating well with our biochemical data on MtMetAP1c inhibition. These results suggest that OJT008 is a potential lead compound for the pre-clinical development of novel molecules for the therapeutic management of TB.

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

: IMPACT OF HOST PHYSIOLOGICAL AND PATHOLOGICAL CONDITIONS ON THE ACTIVITY OF GUT MICROBIAL BETA-GLUCORONIDASE TOWARDS HYDROLYSIS OF BAICALIN

Ms. Nyma Siddiqui - Texas Southern University
NY SIDDIQUI, TI Du, HU Xie, DO Liang, SO Gao
TEXAS SOUTHERN UNIVERSITY(NYS, TID, HUX, DOL,SOG)

Abstract

PURPOSE: The purpose of this study is to determine the impact of host physiological and pathological conditions on the activity of gut microbial beta-glucuronidases (GUS) towards hydrolysis of baicalin. METHOD: Fecal S9 fractions were prepared using feces collected from different types of rats at different ages using baicalin as the substrate. A Waters Acquity Ultra performance liquid chromatography (UPLC) system was used to quantify the metabolite baicalein to analyze the rate of the reaction of the enzymes. The rates were compared by obtaining enzymes through S9 fractions to confirm microbiota ability to hydrolyze the glucuronide and release of the parent compound, baicalein. Fecal S9 prepared from The Fischer 344 (F344) rats at three different ages (i5, 9, and 16 weeks) and different inflammatory conditions treated with Docusate Sodium (DSS) or anti-inflammatory agent herbal mixture Xiao-Chai-Hu Tang (XCHT). Additionally, fecal S9 from genetically modified pirc rats, which spontaneously have inflammation in the colon, was also tested. RESULTS: The results depicted that age had an impact on hydrolysis of the compound baicalin into its parent compound and Fecal S9 from Pirc rats has lower activity and anti-inflammatory agent XCHT can increase microbial GUS activity. The $p<0.05$ making the results statistically significant. The wild type enzymes had a clear increase in Km and Vmax. While PRIC enzymes and enzymes treated with DSS and XCHT had a clear difference in rates, but the Km and Vmax did not increase significantly. The Km for wild type enzymes at ages 5weeks, 9 weeks and 16 weeks were 10.32± 3.41, 24.81 ± 5.09, 64.99± 36.43 respectively. The Vmax for wild type enzymes at ages 5weeks, 9 weeks and 16 weeks were 1.269±0.139, 3.742±0.346, 7.256± 2.65. CONCLUSION: The data shows that microbial GUS activity was higher at elder age. These findings indicate that microbial GUS activity is significantly affected by the physiological and pathological factors of the host.

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

THE NEUROPROTECTIVE AND INFLAMMATORY EFFECTS OF A ZIKA VIRUS INFECTION

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Abstract

PURPOSE: Zika Virus (ZIKV) acts as a teratogenic agent causing congenital Zika syndrome. ZIKV can reduce the ability of human neural progenitor cells and other cells to induce self-repair and cell survival mechanisms. We hypothesize that the cAMP-responsive element-binding protein 3-like 1 (CREB3L1) gene is upregulated during ZIKV infection in neurons. The objective of our study is to assess ZIKV inflammatory effects and expression levels of the CREB3L1 neuroprotective pathway during a ZIKV infection in a time-dependent manner. METHODS: SHSY-5Y neuroblastoma cells were differentiated with retinoic acid and infected with ZIKV at a multiplicity of infection (MOI) of 0.1 at different time points. After examining the cultures for cytopathic effects, we performed a cytokine expression assay and western blot analysis to assess protein expression levels and qRT-PCR to evaluate the gene expression of the CREB3L1 pathway and ZIKV viral load. RESULTS: Our preliminary results show that ZIKV infection at an MOI of 0.1 does not cause altered CREB3L1 pathway RNA and protein levels in a time-dependent manner. Furthermore, there are no significant differences in the cytokine levels of TNF-β, IL-12P70, IL-10, IL-1RA, IL-13, GM-CSF, IL-7, IFN-Ɣ, and TNF-α. DISCUSSION: Our results indicate CREB3L1 expression and pro-inflammatory cytokines are not altered during a ZIKV infection at different time points. The CREB3L1 pathway and its role in neuron cell survival processes and inflammatory response will be further evaluated in SHSY-5Y cells infected with ZIKV.

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: National Institutes of Minority Health and Health Disparities (U54MD007579), Ponce Health Sciences University/Ponce Research Institute, PR IDeA Network of Biomedical Research Excellence (PR-INBRE) (P20GM103475)

PREVALENCE OF ANTIRETROVIRAL THERAPY AMONG HOSPITALIZED PATIENTS WITH HIV

Dr. Hongmei Wang - Texas Southern University
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Texas Southern University (HW, NAT, VT); Houston Methodist Hospital (HW)

Abstract

PURPOSE This study aimed to retrospectively investigate the prevalence of HIV treatment types and identify gaps to fill in clinical practice to improve medication adherence and minimize harm to patients. METHODS This retrospective study is a single-center cohort study performed among HIV-infection inpatients at the Houston Methodist Hospital between January 2019 and October 2021. Data elements collected from the electronic medical record included demographic information and antiretroviral regimens. RESULTS We found that the most commonly used antiretroviral treatment was integrase strand transfer inhibitor (INSTI) (59.9%), followed by protease inhibitor (PI) (15.2%) and non-nucleoside reverse transcriptase inhibitors (NNRTI) (7.4%) in 297 included patients. The combination of INSTI, PI, or NNRTI was observed in 14.5%. Twenty-nine out of 297 patients were on antiretroviral booster treatment. DISCUSSION/CONCLUSION Our findings suggest that antiretroviral treatment regimens pose a different risk for pill burden and drug-drug interactions in clinical practice. Clinicians should proactively review treatment regimens and optimize the regimens to improve patient management in our hospital.

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

Grant Support: The project was supported by the National Institute on Minority Health and Health Disparities of the National Institute of Health under Award Number 2U54MD007605-27A1 and by the National Center for Advancing Translational Sciences, National Institutes of Health, through Grant Number UL1TR001436.

METHOD DEVELOPMENT AND VALIDATION FOR THE QUANTIFICATION OF R14 IN MOUSE WHOLE BLOOD USING LC-MS/MS

Dr. Yang Wang - Texas Southern University
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Texas Southern University (YW, JM, HX, DL); The University of Texas MD Anderson Cancer Center (SYL)

Abstract

PURPOSE Due to the limitation of blood volume, it is hardly applied one mouse for a multiple-time-point pharmacokinetic (PK) study. R14, NOX Inhibitor VII, a NOX2 inhibitor, is unstable in bio-matrix. In the present study, we developed an LC-MS/MS method for the quantification of R14 in 10 µL of mouse whole blood samples that could be stably stored in a -70 freezer over 20 days. METHODS The assay was performed on a 6500+ Triple Quad LC-MS/MS System (AB SCIEX LLC.) with a Synergi Fusion-RP column (50 x 2 mm, 4 µm, Phenomenex Inc.). The optimized method used binary gradient mobile phases at a flow rate of 0.4 mL/min with a 2 µL of injection volume. Multiple Reaction Monitoring (MRM) data were collected under positive mode to detect transitions m/z 260.1→ 168.1 for R14, and m/z 353.3→ 285.1 for griseofulvin (Internal Standard). The mouse whole blood sample volume was 10 µL. The method was validated according to the FDA guidance. RESULTS The preservative composition was optimized to allow R14 stably stored in a -70 °C freezer up to 20 days. The linearity of the calibration curves was found in the range of 1 – 1000 ng/mL. The intra-day and inter-day accuracy (RE%) was -8.11 - 12.73 %, and the precision (CV%) were 5.31- 13.55 % at LLOQ (1 ng/mL), low, medium, and high QC levels (3, 50 and 800 ng/mL). Matrix effects were ranged from 93.36 % to 97.98 %, and the recoveries were between 52.77 % and 54.65 %. CONCLUSION An LC-MS/MS method for the quantification of R14 in 10 µL of mouse whole blood samples was developed and validated according to FDA guidance. The method could be applied to R14 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 NIH/NIMHD-Research Centers in Minority Institutions Program (U54MD007605) and Cancer Prevention & Research Institute of Texas (CPRIT) Core Facilities Support Awards (RP180748).

MICROBIOLOGICAL FACTORS ASSOCIATED WITH PERIODONTAL HEALTH DISPARITIES

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H Xie
Meharry Medical College

Abstract

Periodontal health disparities present a challenge to oral health and overall health. Here, we examined the distribution of several potential periodontally beneficial and pathogenic bacteria in the oral cavities of Caucasian Americans (CAs), African Americans (AAs), and Hispanic Americans (HAs). We collected dental plaque samples from 298 individuals with intact periodontium prior to any dental treatment. We quantitated oral bacteria using qPCR and obtained medical and dental histories retrospectively from axiUm. Data were analyzed statistically using SAS 9.4.

We discovered that: (1) neighborhood medium incomes were significantly higher in the CAs compared with the AAs and the HAs; (2) the level of periodontal inflammation was found higher in the AAs than in the CAs and the HAs; and (3) the detection rates for Porphyromonas gingivalis were higher in the AAs and the HAs than in the CAs. Moreover, most P. gingivalis detected in AAs were fimA genotypes II and IV that are associated with higher indexes of plaque and bleeding on probe. We also found more of CA participants possess higher Streptococcus cristatus/P. gingivalis ratios of, compared to AA and HA participants. Our results suggest that socioeconomic disadvantages, higher detection rates of P. gingivalis, particularly at younger ages, and higher detection rates of P. gingivalis strains carrying fimA genotypes II and IV pose greater risks for periodontal 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: MD007586

5.0 - COMMUNITY-BASED PARTICIPATORY RESEARCH

COVID-19 VACCINE HESITANCY AMONG MINORITY POPULATION IN EAST HARRIS COUNTY

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TO ADEBUSUYI; C Capo; I Poon
Texas Southern University (TA, IP), East Harris Empowerment Council (CC)

Abstract

PURPOSE: COVID-19 has disproportionately affected minority populations in the US; however, Blacks and Hispanics have been less likely than Whites to receive a vaccine, mainly due to mistrust in the vaccines. This survey aims to investigate vaccine hesitancy in an underserved community (East Harris County, Houston, Texas) from November 2021 to March 2022. METHODS: After the East Harris County Empowerment Council's Health classes, we collected a self-reported online survey. The survey contains questions such as the vaccine hesitancy scale (VHS) and open-ended questions about what it will take for them to get vaccinated. In addition to the VHS, measures included socio-demographic items, vaccine pressure, Covid-19 decision-making stage, and vaccine safety. RESULTS: A total of 69 individuals (97.52%) agreed to the informed consent and completed the web-based questionnaire (79.10% female, 19.40% male; average age 25 years old. The individuals were 65.67% Hispanic, 22.39% Black, 7.46% White, 1.49% Asian, and 2.99% other, with 52.24% completing less than a high school degree. 59.70% of participants agree that there is adequate information about the vaccine, and 11.94% disagree. Among those who had two doses (80.6% of participants), 62.71% were prepared to take the booster shot. Out of the 11.94% that haven't taken either dose of the vaccine, 75% were either not sure or wouldn't take the vaccine if they had the opportunity. DISCUSSION: Our study estimated vaccine hesitancy in a young community of color cohort. Although a high percentage of participants were satisfied with the level of information, approximately one in ten participants had not received the full vaccine doses, and two-thirds of them were vaccine-hesitant or resistant. This study also provides important insights on what motivates them to get the vaccination.

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

Grant Support: This projected is supported by The Albert Schweitzer Fellowship

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LEVERAGING AND EXPANDING MORESHOUSE SCHOOL OF MEDICINE'S COMMUNITY ENGAGEMENT STRATEGIES TO IMPORVE THE SUCCESS OF CEAL AND RADXUP

Dr. Tabia Henry Akintobi - Morehouse School of Medicine
Holliday, R.C, Quarells, R. C., Taylor, B., Wimbly, T., Akintobi, T. H.
Morehouse School of Medicine

Abstract

Purpose: The Morehouse School of Medicine's preeminence in community engaged (CE) research has been leveraged to lead several local and statewide initiatives over time. This positioning, along with the ongoing pursuit of trustworthiness poised MSM to lead the Georgia Community Engaged Alliance (CEAL) Against COVID-19 Disparities and collaborate on the RADxUP initiative. These NIH funded initiatives, address COVID vaccination and testing approaches statewide. GEORGIA CEAL has actively partnered with African American and Latinx communities to conduct pandemic outreach, communication, and research response through a 25+ member Community Coalition Board. A community a scientific partner board similarly leads the states RADxUP initiatives. Methods: Community networks =have been leveraged to conduct key informant interviews and focus groups. A cross sectional survey was administered (N=2004) in 19 priority Georgia counties. Results: Specific areas identified through qualitative research were outreach and collaboration with local public health and community organizations; discussion on the need for tailored and not "one size fits all messaging"; the need to address historical medical maltreatment and systemic racism; and lack of a focus on influenza vaccination as a predictor of health behaviors. Surveys data was weighted by several county-specific factors, among which were % AA /Latinx, recent GA DPH estimates of COVID-19 case rate, vaccination rates and the CDC-developed social vulnerability index. Processes, results, and outcomes associated with the leadership of an Historically Black Medical School in community-partnered COVID-19 response will be detailed in this presentation and reflect the significance of translational research coupled with public outreach and communication to inform COVID-19 vaccination, testing, uptake, and messaging strategies.

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

Grant Support: Grant#'S 3P30DK11024-05S1 and P30DK111024-06W2 (RADxUP);1OT2HL156812-01/16-312-0217571-66105L (CEAL)

PHOTOVOICE, YOUTH ACTIVISM, AND ADOLESCENT MOTHERS

Dr. Carolien F. D. Black - Northern Arizona University
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Northern Arizona University Department of Teaching and Learning (CFDB, NFC, TK)

Abstract

PURPOSE: Adolescent mothers (AMs) are often stereotyped as unmotivated students and irresponsible parents, which contributes to their psychological distress and ultimately leads to educational disparities and psychosocial inequities. Yet, many AM identify parenthood as a transformative experience. Given that AM, a majority of whom are Black, Latinx, and Native American, are at risk for school dropout and depression, there is a clear need to elevate AMs' voices in adult dominated spaces to counter hegemonic discourse about their lived experiences. Hence, using photovoice techniques the current study aims to document the complexity of AMs' realities, promote youth activism (YA), and identify solutions to AM-identified issues. METHODS: We collaborated with AM enrolled in an alternative high school and their teachers to develop and implement a photovoice curriculum by utilizing principles of community-based participatory research (CBPR) and grounded theory. CBPR and photovoice support AM by elevating their voices, raising awareness about their needs, and offering opportunities for activism. We will utilize grounded theory with constant comparison to analyze qualitative data sources (e.g., field notes, AM photography). EXPECTED RESULTS: The project will culminate with an AM curated community photography exhibit. Results will generate theory about AMs' lived realities, facilitate critical discourse with the community about these experiences, and identify solutions to address any AM-identified issues. DISCUSSION: Photovoice democratizes research and provides opportunities for AM to engage activism. Hence, we anticipate that this study will generate meaningful theory about AMs' lived experiences by empowering them to construct and represent what is important to them as young parents, which will be affirmed through a shared community. Lessons will also highlight the importance of utilizing participatory methods of research with 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: This project is supported by Northern Arizona College of Education Dean's Research Grant Award and National Institute on Minority Health and Health Disparities (NIMHD), (MPIs Baldwin/Stearns; Award #U54MD012388).

CANCER SURVIVORSHIP AND CAREGIVING LEADERSHIP TRAINING IN AFRICAN AMERICAN CHURCHES

Dr. Sharon Cobb - Charles R. Drew University of Medicine and Science
SH COBB, KA Jenkins, RH Holbert
Charles R. Drew University of Medicine & Science (SHC, KAJ, RHH)

Abstract

PURPOSE: Rooted in systemic inequities, cancer disparities continue to persist for African Americans. Greater awareness is necessitated for this population, which may include cultural and spiritual-guided interventions in religious institutions. African American churches have been pivotal for inciting health behavior change among parishioners and their families, yet leadership training for church leaders are rarely initiated. The aim of the study was to increase cancer survivorship and caregiving (CSC) knowledge, skills, and confidence among African Americans, METHODS: Over a 3-month period, we hosted a pilot leadership training program for African American church leaders and parishioners, which included 24 hours of virtual mini-lectures, discussions, and small group activities. Some themes included 1) Medical Mistrust, 2) Community Engagement, 3) Comorbidity & Cancer Symptom Management, 4) Nutrition for a Cancer Diet, and 5) Cancer-Related Stigma. Survey results were analyzed with descriptive statistics. RESULTS: A total of 38 leadership trainees participated in the CSC trainees. The majority of trainees (85%) identified as a clergy wife or faith-based/ministry leader. Over 21% reported a history of cancer, with 29% identifying as a cancer caregiver. Almost 40% believed that cancer survivors and caregivers do not receive enough support from churches. As a result of their training, 85% reported they wanted to provide emotional care and 47% desiring to provide medical/therapeutic care. DISCUSSION: This pilot project supports the premise that health-based leadership training programs within religious institutions may be effective in decreasing health inequities for underresourced minorities. These initial results suggest that future interventions should center on building collaborative healthcare provider/church leader support dyads to enhance the survivorship journey and enhancing self-efficacy.

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: This project was supported by the CDU Accelerating Excellence In Translational Science (AXIS) center (3U54MD007598; PI: J. Vadgama).

COVID-19 VACCINE UPTAKE AMONG AFRICAN AMERICANS AND LATINXS

Dr. Sharon Cobb - Charles R. Drew University of Medicine and Science
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Charles R. Drew University of Medicine and Science (SHC, ATD, MEW, ROV, CYG, MOB), Housing Authority of the City of Los Angeles (JET, JES)

Abstract

BACKGROUND: COVID-19 vaccination rates among African American and Latinx populations remain low and linked to systemic inequities and medical mistrust. This is exhibited in higher rates of morbidity and mortality among these groups. Public housing residents are greatly affected by these disparities and are likely to have increased risk for COVID-19 illness. The goal of this study was to utilize an academic-community partnered approach to decrease COVID-19 vaccine hesitancy among African American and Latinx public housing residents. METHODS: Utilizing a

multidisciplinary approach, four virtual, bidirectional townhalls centered on COVID-19 vaccination were hosted in both English and Spanish. Sessions were led by various leaders, including physicians, nurses, public health professionals, community organizers, and public housing residents. Following each forum, on-site health fairs were hosted at public housing areas to provide health assessments and vaccines for residents. Participants completed pre- and post-questionnaires to assess change in COVID-19 vaccine knowledge and uptake. RESULTS: A total of 334 African American and Latinx public housing residents participated in the townhalls and health fairs. Over 15% received a COVID-19 vaccination at the health fairs. Results showed that prior to the townhalls, 36% reported being very unlikely to receive COVID-19 vaccination compared to 10% after the townhalls. Additionally, 74% of participants perceive the COVID-19 vaccine as important to their health after the townhalls compared to 69% at baseline. Over 70% agreed COVID-19 vaccine sources are trustworthy and reliable after the townhalls. CONCLUSION: Findings from our intervention demonstrate the strong impact of an academic-community collaboration in influencing COVID-19 vaccine uptake among public housing residents. Despite hesitancy, our data suggest that this population is interested in learning about COVID-19 vaccines and value 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: Funding: This study was supported by the National Institutes of Minority Health and Disease (NIMHD) under awards 3U54MD007598-14S3 AXIS-(PI: Jaydutt Vadgama)

ACADEMIC-COMMUNITY TEAM FOR IMPROVING VACCINE ACCEPTABILITY AND TARGETED ENGAGEMENT AMONG PUBLIC HOUSING RESIDENTS

Prof. Attallah Siedah Dillard - Charles R. Drew University of Medicine and Science
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Charles R. Drew University of Medicine and Science (CDU); Housing Authority of the City of Los Angeles (HACLA), Los Angeles, CA

Abstract

Background: African American and Latinx groups are disproportionately affected by COVID-19, exhibited by high morbidity and mortality rates. Public housing residents have largely remained hesitant towards COVID-19 vaccination. Community partnered interventions may be beneficial in decreasing cultural and psychosocial barriers of COVID-19 vaccine uptake among African American and Latinx residents. This pilot study aimed to evaluate the effectiveness of a multidisciplinary, community-based COVID-19 vaccine leadership training program. Methods: A virtual COVID-19 vaccine leadership training series was delivered to 72 participants, recognized as Academic-Community Team for Improving Vaccine Acceptability and Targeted Engagement (ACTIVATE) program. Triads comprised of public housing residents, Physician Assistant students, and public health students received training on cultural, systemic and patient-related challenges to COVID-19 vaccine uptake among public housing residents. Participants completed pre- and post-training questionnaires to assess change in COVID-19 vaccine knowledge, attitudes, and skills. Results: Among our 72 participants, 95% reported increase in their knowledge preparation 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 compared to 67% following training. Conclusion: Findings demonstrate the effectiveness of a multidisciplinary and culturally sensitive educational training for increasing COVID-19 vaccine knowledge and mitigating hesitancy among under-resourced populations. Multidisciplinary teams are in a unique position to influence COVID-19 vaccine uptake. This approach is critical as public housing residents have unique challenges that can be supported with community-integrated support and resources.

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

Grant Support: This study was supported by the National Institutes of Minority Health and Disease (NIMHD) under awards 3U54MD007598-14S1 AXIS-Overall (PI: Jaydutt Vadgama)

MESSAGES AND MESSENGERS TO BUILD COVID VACCINE CONFIDENCE IN BLACKS

Dr. Jennifer Erves - Meharry Medical College
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Meharry Medical College (JCE, JD, MS); St. Jude Children's Research Hospital (HMB); Vanderbilt University (WG); Congregational Health and Education Network (OL, KC)

Abstract

PURPOSE COVID-19 vaccine hesitancy is disproportionately higher among Black Americans compared to White Americans. Strategic communication is necessary to increase confidence among individuals who are vaccine hesitant. We aim to: 1) explore determinants of vaccine hesitancy; and 2) describe the development of a theory-based, culturally appropriate message library targeting concerns around COVID-19 vaccines among Black Americans. METHODS After forming a community-academic partnership, a four-phased, formative research process was used to explore COVID-19 vaccine hesitancy and iteratively develop theory-based, culturally-appropriate messages: (1) Literature review; (2) Review by clinical and research experts for content validation (n=5); (3) Ongoing input and review by a Community Advisory Panel; and (4) Semi-structured interviews (n=30) with Black American Community Members. An iterative-deductive approach was used to analyze focus group data. RESULTS / EXPECTED RESULTS Themes from semi-structured interviews were: 1) Motivators to getting COVID-19 vaccination; 2) Barriers to getting COVID-19 vaccination; 3) Community views on COVID-19 messages; and 4) Preferred channels to distribute messages. Feedback from community members and scientific experts was iteratively used to update message content to ensure cultural-appropriateness. The final message library included 18 message subsets for adults and there were 17 message subsets for parents. These subsets were placed into three categories: 1) Vaccine development; 2) Vaccine safety; and 3) Vaccine effectiveness. DISCUSSION / CONCLUSION We describe motivating factors and barriers to COVID-19 vaccination and a systematic community-engaged process for message library development. Future work should determine the impact of these messages on COVID-19 vaccination rates among Black Americans in an intervention.

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 is supported by National Institute on Minority Health and Health Disparities (#3U54MD007586-34S7).

HOME BASED FOOD AND NUTRITION ACTIVITY KITS FOR PEDIATRIC PRODUCE PRESCRIPTION PARTICIPATION IN HAWAII.

Dr. Monica K Esquivel - University of Hawaii at Manoa
MK ESQUIVEL; C Shelton; R Kaeo; A Higa; M Okihiro
University of Hawaii at Manoa (MKE, CS, MO), Waianae Coast Comprehensive Health Center (RK, AH, MO)

Abstract

PURPOSE Hypothesis Home food and activity kit provision will be positively associated with Keiki (Child) Produce Prescription Program (KPRx) participation. Objectives The research objective is to quantify the impact of the home activity kits on KPRx participation. Goal The goal is to identify strategies to increase participation in KPRx among children from households with food insecurity. Purpose KPRx aims to improve access to healthy foods such as fruits and vegetables and reduce health disparities. The KPRx provides Waianae Coast Comprehensive Health Center (WCCHC) pediatric patients from households with food insecurity with vouchers to purchase fresh fruits and vegetables ($50 per month for 6 months, $300 total). The KPRx feasibility study found the program to be popular but

voucher redemption was low (15%). Community feedback was solicited and encouraged the KPRx team to develop interactive food and nutrition activity kits for program participants to aid in improving program participation. METHODS KPRx study participants were allocated to either the intervention (received food and activity bags "FAB kits" each month) or control group (fruit and vegetable alphabet card set). KPRx participation and voucher redemption was tracked monthly. Independent t-tests were utilized to detect differences in participation between the two groups. RESULTS There was no statistical difference in participation between the two groups. Mean participation for the intervention group (n=36) was $223.52 and 4.88 months, compared to $195.85 and 4.39 months for the group (n=41). DISCUSSION/CONCLUSION Provision of FAB kits did not have positive relationship with KPRx program participation. Subsequent research should explore additional factors contributing to these research findings.

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

Grant Support: Funded by the National Institute on Minority Health and Health Disparities, National Institutes of Health, grant #2U54MD007601-31

EXPLORING THE LEVEL OF TRUST AMONG AFRICAN AMERICANS PARTICIPATING IN BIOMEDICAL RESEARCH IN CENTRAL MS

Dr. Traci Hayes - Other
TT HAYES; M Fortenberry; C Addison, PB Tchounwou; D Antoine-LaVigne
Jackson State University (MF, CA, PBT, DAL); University of Southern Mississippi (TTH)

Abstract

Purpose: Equitable health systems providing patient-centered care are grounded in research which adequately engages diverse populations. Removing barriers to involve the community in biomedical research improves diagnosis and treatment of diseases and illnesses as well as uptake among these populations. Since the onslaught of COVID-19, misinformation and conflicting agendas have created new challenges for communities historically distrusting of research and slow to engage. The purpose of this study was to assess the attitudes and trust levels towards biomedical research, the willingness for study participation, and COVID-19's effect on willingness to participate. METHODS: The cross-sectional study relied on a modified version of the Jackson Heart Study Community Trust Survey to include COVID-19-related questions. Data were collected from November 2021 – March 2022 from residents in three counties of Central Mississippi, served by the RCMI Center for Health Disparities. The data were analyzed using descriptive statistics. RESULTS: A total of 125 survey (78% female; 32% male) responses were used in the analysis. Sixty-seven percent were between the ages of 35-64 years old. Nearly 40% had never participated in any type of research activities. The respondents had favorable attitudes toward research participation. Increased trust was associated with the researcher's attitude, race, and potential benefit for the community. Compensation and incentives were important for research participation as well as having support from community leaders. More than 80% trusted the COVID-19 health information and were willing to participate in COVID research. DISCUSSION: The results support the importance of trust to research participation. The level of trust was influenced by the researchers' race and understanding and attitude towards the community in which the studies were conducted. The findings present factors that will drive community participation in biomedical research.

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

Grant Support: The Research Center for Health Disparities Research at Jackson State University is supported by RCMI grant U54 MD015929 from the National Institutes of Health (NIH) National Institute on Minority Health and Health Disparities (NIMHD).

NATIVE SPIRIT: DEVELOPMENT, IMPLEMENTATION, AND EVALUATION OF A CULTURALLY-GROUNDED AFTER-SCHOOL PROGRAM.

Dr. Amanda M. Hunter - Northern Arizona University
AM Hunter; M Carlos; F Muniz; A Holiday
Northern Arizona University (AMH), Salt River Pima-Maricopa Indian Community (MC), Arizona State University (FM), University of Arizona (AH)

Abstract

American Indian and Alaska Native (AIAN) youth have the highest rates of lifetime major depressive episodes and, in 2017, AIANs (ages 15-19) had twice as many suicides compared to White adolescents. Major depression and suicide are often co-occurring with substance use disorder (SUD) and AIANs experience disproportionately high rates of lifetime SUD with peak prevalence rates at 16 years of age. These data demonstrate the need for early intervention to promote health among AIAN adolescents. AIAN adolescents who are culturally engaged experience positive health outcomes when compared to those who are not culturally engaged. Culturally-grounded after-school programs (ASPs) are a proven strategy to promote wellbeing for AIAN youth. This study proposes to partner with ASPs serving AIAN youth to assess the impact of a 10-session intervention designed to enhance protective factors associated with adolescent behavioral health including decreasing substance use. The goals of the proposed study are to: 1) strengthen self-esteem, resilience, and cultural identity, and 2) attenuate substance use among urban AIAN youth (grades 7-12) through participation in a culturally-grounded ASP, named Native Spirit (NS). This study will use a mixed-methods design to evaluate the impact of participation in the NS program. The study will measure changes to participant self-esteem, cultural identity, self-esteem, and substance use using a pre- and posttest self-report survey and participant interviews. This study provides an innovative connection between cultural engagement and health outcomes for AIAN youth and also highlights unique opportunities for health promotion with collaborations with ASPs that serve AIAN communities.

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

COMMUNITY TRAINING INSTITUTE FOR HEALTH DISPARITIES: INCREASING COMMUNITY CAPACITY BUILDING IN HEALTH DISPARITIES RESEARCH AND HEALTH EDUCATION

Dr. Julio Jiménez-Chávez - Ponce Health Sciences University
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Ponce Health Sciences University, Ponce Research Institute

Abstract

Health inequities perpetuate and contribute to the growing number of chronic medical conditions which include cardiovascular diseases, obesity, among others. Hispanic/Latino populations have a disproportional impact on chronic conditions. Community engagement is a proven strategy aimed at reducing health disparities integrating community members (CM) as research collaborators, including in education and dissemination efforts. The purpose of this study is to share the results of the implementation of the Community Training Institute for Health Disparities (CTIHD) as a sustainable mechanism to provide CM research and health education knowledge and skills. Using Community-Based Participatory Research (CBPR) approach, the CTIHD was developed integrating academic researchers and community partners. The CTIHD has three components: a) training of community members to participate in research activities together with academic researchers and develop outreach health education plans, b) conduct community health needs assessments, and c) health education dissemination to reduce risk factors associated with chronic medical conditions. A total of 19 community trainees completed the didactic courses with an overall retention rate of 80% and 99% satisfaction. A statistically significant difference ($p<0.05$) was detected in knowledge acquired. A mixed sequential exploratory study was conducted to identify community priorities, increase understanding of health-related risk behaviors, and determinants of chronic medical conditions. Additionally, community outreach educational activities, health educational social media posts, social media followers, newsletters, and infographics were developed to disseminate community health education. Providing opportunities for community capacity building is critical in aligning actions to address health community needs reducing health inequities. CBPR approach is a critical framework that must be included in populations to reduce 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: This study was supported by: NIH/NIMHD Grant 5U54MD007579-37.

BASELINE PARTICIPANT CHARACTERISTICS OF A COLORECTAL CANCER SCREENING STUDY

Dr. John S Luque - Florida A & M University
D JACKSON; GE Kiros; M Vargas; OO Matthew; T Austin; R Tawk; A Ali; CM Harris; K Wallace; CK Gwede; JS Luque
Florida A&M University (DJ, GEK, MV, OOM, TA, RT, AA, CMH, JSL); Medical University of South Carolina (KW); Moffitt Cancer Center (CKG)

Abstract

PURPOSE: African Americans experience colorectal cancer (CRC) health disparities as compared to whites, which are partly attributed to lower screening rates. Interventions using community health advisors (CHA) to increase access to CRC stool-based tests are considered a potentially effective strategy for African American patients who are not up to date. Test Up Now Education Program (TUNE-UP) is a behavioral clinical trial, and baseline characteristics of study participants – ages 45-64 years – from two community health centers (CHC) are reported. METHODS: The TUNE-UP study is designed as a two-group pretest/posttest randomized controlled trial. The two study arms are: 1) intervention group which receives adapted NCI Screen to Save (S2S) educational materials, a tailored CRC brochure, and CHA education supplemented by text messages; and 2) control group which receives the brochure only. All participants received the stool-based screening from their CHC. The baseline survey collects patient information on demographics, insurance status, communication with health professionals, as well as CRC-related measures on knowledge and behavioral constructs using validated measures. RESULTS: From April 2021 to February 2022, 65 participants (45% male and 55% female) were recruited to the trial using CHC messaging. Only 34% of participants reported they currently had health insurance. When asked if a doctor had discussed different CRC screening tests, 48% responded “no” or “never.” In addition, 77% had never had a colonoscopy. More than 67% had never done a stool-based screening at home, and 31% did not know how to do it. In response to knowledge questions, 66% answered correctly that the stool-based screening tests for blood. DISCUSSION: Given reported gaps in knowledge, lack of provider discussion of screening tests, and low rates of previous CRC screening, the 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.

COMMUNITY RESILIENCE THROUGH THE LENS OF RELIGIOUS LEADERS

Dr. Lisa Michelle Paulin - North Carolina Central University
LM PAULIN, T Zhang, U Hoffler, D Kumar
North Carolina Central University

Abstract

PURPOSE: Church plays an important role for many Black communities and pastors can be trusted and resourceful agents in the community for health information, especially in light of lingering health disparities and high rates of certain conditions. This study sought to explore the impact of COVID in black communities by speaking with pastors of predominantly Black churches. METHODS: In September 2021, I conducted a focus group with 12 Black pastors in Durham County, North Carolina to get their perceptions of how COVID was impacting their congregants as well as

themselves. They were from a mix of urban, suburban, and rural churches. The audio file was transcribed and analyzed using grounded theory to discover prevalent themes. Unlike a survey with prescribed answers to choose from, interviews and focus groups allow participants to provide more depth to explain, illustrate, and generate their own responses about a topic. RESULTS: Among the prevalent themes were anxiety and stress for congregants and pastors that manifested themselves in different ways, issues of technology and the elderly, and dealing with overall health conditions. This presentation will share details and examples of the themes. For example, one pastor said that he told the kitchen staff that "Everything doesn't have to be baptized in Crisco." DISCUSSION: Because faith-based organizations are frequently used in community-based health research and outreach, this study provides a deep dive into the complexities that church officials deal with individually and when communicating with the people who trust them. Additionally, it demonstrates how qualitative research can inform survey research. If surveys aren't asking the right questions, how reliable is the data we gather?

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

Grant Support: CARES Act

A COLLABORATIVE FOOD DELIVERY RESPONSE TO ADDRESS FOOD INSECURITY IN UNDERSERVED SOUTH FLORIDA'S HOUSEHOLDS DURING THE COVID-19 PANDEMIC

Dr. Lea Sacca - Florida International University
Nana Aisha Garba1, Lea Sacca1, Rachel D. Clarke1, Prasad Bhoite1, John Buschman2, Virama Oller1, Nancy Napolitano1, Samuel Hyppolite1, Sophia LaCroix1, Al Archibald3, Ocean Hamilton4 Tobi Ash5, and David R. Brown1
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Abstract

Introduction: Food insecurity, a social determinant of health (SDOH) linked to malnutrition and lack of sufficient access to food for an active and healthy life, was significantly exacerbated by the COVID-19 pandemic across the U.S. and globally. NeighborhoodHELP, an innovative service-learning, community outreach program, geared towards addressing SDOHs in Miami Dade County's underserved communities, utilized a short-term community-based collaborative approach to address food insecurity among its members during the pandemic. Approach: Immediately after the social distancing mandate was passed, NeighborhoodHELP outreach workers, student teams, and program faculty started to conduct weekly needs assessments via phone calls to every enrolled household. These efforts led to the identification of several pandemic-related urgent needs, chief among which was food insecurity. Consequently, the program collaborated with Florida International University's Chaplin School of hospitality, community partners, and a benefactor who provided financial support, to develop a food donation and delivery project. Results: The NeighborhoodHELP food donation and delivery project lasted for 14 months during which,1,543 culturally appropriate food boxes were delivered biweekly to 289 households comprising 898 household members. The project wrapped up systematically over a 4 month period, after the social distancing mandate was lifted, resulting in an increase the availability of food distribution sites within communities. Discussion: This project underscores the importance of leveraging community assets to address their needs during a crisis, and the value of a sustained community engagement to researchers and service providers who work in underserved communities.

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

Grant Support: N/A

SOCIETAL BARRIERS TO COVID-19 TESTING AND VACCINE UPAKE

Dr. Maureen Sanderson - Meharry Medical College
M Sanderson, V Mallett, M Cook, W Im, D Wilus, R Kimbrough, M Blasingame, G Ikwuezunma, E Orok, B Reed
Meharry Medical College (MS, VM, MC, WI, DW, RK, GI, EO, BR); Vanderbilt University (MB)

Abstract

PURPOSE: To design a community-engaged research project on societal barriers to COVID-19 testing and vaccine uptake in minority women who received services from the YWCAs in Atlanta, El Paso, Nashville and Tucson. METHODS: A Community Advisory Board (CAB) composed of members of our Meharry Community Engagement Core CAB and a staff and affiliated member of each YWCA guided the study design. From May through December 2021, we conducted focus groups (n=56) and surveys (n=663 women) to examine the impact of the COVID-19 outbreak on women and their families. RESULTS: There was no difference in receiving a COVID-19 test by race/ethnicity. Of the 565 women who indicated they received or were planning to receive the COVID-19 vaccine, Black women were significantly less likely than Hispanic women to indicate their positive decision was based on protecting my family, protecting my community, life won't go back to normal until most people are vaccinated, and the belief that the vaccine is safe. Black women were more likely than Hispanic women to indicate their positive decision was based on the recommendation of religious leaders. Of the 79 women who indicated they had not received or were not planning to receive the COVID-19 vaccine, Black women were significantly more likely than Hispanic women to indicate their negative decision was based on not being concerned about getting seriously ill from COVID-19, and being concerned about getting infected with COVID-19 from the vaccine. These differences persisted after adjustment for date of survey completion and educational level. CONCLUSION: The differing reasons given by Black and Hispanic women for receiving or not receiving the COVID-19 vaccine should be useful for tailoring vaccine uptake interventions specific to these women and their families. Future research will examine the impact of racial/ethnic discrimination on receipt of COVID-19 testing and vaccine uptake.

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

Grant Support: This study was funded by the National Institute on Minority Health and Health Disparities (U54MD007586-35S6).

A COLLABORATIVE PILOT STUDY TO DESIGN AND OPTIMIZE THE CEASE DIGITAL PEER-MOTIVATION SMOKING CESSATION INTERVENTION FOR UNDERSERVED POPULATIONS

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Morgan State University (PS, SF, RAB, AA, ES, FA, AO, TL, AF, JA

Abstract

PURPOSE: To collaboratively design, pilot test, and optimize a digitized version of the CEASE smoking cessation intervention to enhance the outreach and effectiveness of smoking cessation METHODS: The Communities Engaged and Advocating for a Smoke-free Environment (CEASE) is a long-standing research partnership that has developed, implemented, and continuously improved a peer-motivation community-based smoking cessation program for underserved communities. Through CEASE, 1,807 participants have received smoking cessation services with quitting outcomes ranging from 9.4% to 30.1%. In each phase, the intervention has been improved using lessons learned from previous phases. Recently, CEASE partners have co-designed and pilot tested a digital version of the program (i.e., a website, the study protocol, the facilitation guide, and research tools), surveyed 227 local residents, and recruited 18 participants into two pilot in-person and virtual classes. Twelve participants were followed after three months and participated in two focus group discussions. RESULTS: From survey participants (n=227), 63.9% (n=145) reported regularly using tobacco from which 90.0% (n=130) expressed willingness to quit and participate in CEASE classes. Twelve and six individuals were recruited into seven weekly in-person or virtual classes, respectively. At the three-months follow-up, three participants from the in-person group (n=8) and two from the

virtual group (n=4) were no longer smoking. Focus group participants (n=12) revealed high-level satisfaction with the classes; were comfortable with virtual engagement and technology; and appreciated the significance of their learning. Participants provided important recommendations for improving the quality of CEASE training and facilitation process. CONCLUSIONS: Digitizing CEASE smoking cessation interventions has the potential to increase its outreach and usability with promising benefits for 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: This work was supported by the National Institute on Minority Health and Health Disparities RCMI@Morgan #5U54MD013376-8281.

A COMMUNITY PARTNERSHIP TO DECREASE VACCINE HESITANCY

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Florida A&M University (SGS, TCL, SGB, GEK, KFS), Gadsen Community Health Council (EJD, FAB)

Abstract

PURPOSE: The overall goal of this community partnership is to expose social determinants, as well as behavioral and social factors that influence COVID-19 vaccination. Over the course of the vaccination rollout, Black people have been less likely than their White counterparts to receive a vaccine, but these disparities have narrowed over time. It is hypothesized that hesitancy to COVID-19 vaccination in the Black population may be influenced by perceptions about COVID-19 vaccination safety as well as inequities in the availability of vaccines to rural and underrepresented populations. METHODS: An 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. Data was collected via the Qualtrics survey platform. Basic descriptive analyses including frequencies, percentages, and means were performed to assess the distribution of responses. RESULTS: Ninety-four percent of survey respondents identified as Black. Although 44% of individuals indicated a belief that Black people are more likely to suffer more severe outcomes than Whites, the majority (69%) believe that people with chronic health conditions play a role in determining who will have worse outcomes. Respondents indicated that being encouraged by friends and family (47%) and free vaccines (44%) influenced the decision to vaccinate. CONCLUSION: Preliminary data suggest that reinforcing factors (social support) and enabling factors (free vaccines) contributed to increasing vaccine rates among this population. Intention to vaccinate may also be influenced by the community's understanding that predisposing factors such as pre-existing conditions, rather than race/ethnicity alone, play a role in determining COVID-19 outcomes. These results suggest that strategies that strengthen social networks and ensure access to vaccination resources may be pivotal to building vaccine confidence and participation.

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

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

MITIGATING COVID-19 RISK AND VACCINE HESITANCY AMONG UNDERSERVED AFRICAN AMERICAN AND LATINX INDIVIDUALS WITH MENTAL ILLNESS THROUGH MENTAL HEALTH THERAPIST FACILITATED DISCUSSIONS

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AL Venegas-Murillo, S Grace, S Cobb, and M Bazargan,
Charles R. Drew University of Medicine and Science (ALVM, SC, MB); Tessie Cleveland Community Service Corporation (SG)

Abstract

Background: Underserved ethnic minorities with psychiatric disorders are at an increased risk of COVID-19. This study aims to examine the effectiveness of one-to-one counseling on COVID-19 risk factors and prevention guidelines among underserved African American and Latinx individuals with mental illnesses. Methods. Through an academic-community partnered collaboration, a multidisciplinary and culturally sensitive training on COVID-19 was co-developed and delivered to 68 therapists from January-March 2021. Mental health clients and their caregivers were recruited to participate in pre- and post-intervention surveys to evaluate the impact of the intervention on their perceptions of COVID-19 public health guidelines, testing, and vaccination. Mental health therapists delivered four lessons of the COVID-19 educational intervention with 254 clients from March-June 2021, when vaccine availability was widely available. Of those clients, we collected 180 baseline and 115 follow-up surveys. The main outcome was the uptake in COVID-19 vaccine. Results. There was a positive shift in participant vaccine acceptance and receptivity. Pre-intervention survey shows that only 56% of adult clients and 49% of caregivers had indicated a likelihood of getting the vaccine at baseline. Post-intervention documented that more than 57% of each group had been vaccinated, with another 10-15% of the unvaccinated individuals reporting that they were somewhat or very likely to get the vaccine. Conclusion. This study demonstrated that multidisciplinary academic-community and theoretical-based educational intervention delivered by mental therapists is an effective strategy in increasing COVID-19 vaccine acceptance and reducing the negative impact and disruption that COVID-19 caused in the daily life of mental health patients and caregivers.

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

Grant Support: This study was supported by the UCLA David Geffen School of Medicine COVID-19 Research Award # UCLA COVID 19 OCRC HE 20-54 to Charles R. Drew University of Medicine and Science (PI: M. Bazargan). Additionally, Drs. Cobb and Venegas were supported by the National Institutes of Health (NIMHD) under awards R25 MD007610 (PI: M. Bazargan).

ADDRESSING DISPARITIES IN UNMET SERVICE NEED AMONG CHILDREN WITH ADHD

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Abstract

Despite having higher Attention-deficit/hyperactivity disorder (ADHD) prevalence, children from low-socio-economic status (SES) and ethnic/racial minority (ERM) families are less likely to receive intervention services than children from higher-SES and White families. The present study aims to extend the reach of evidence-based services for ADHD to children from low SES and ERM backgrounds attending schools with limited resources using mobile health (mHealth) technology. This ongoing qualitative pilot project aims to solicit critical input using a series of three focus groups and individual key informant interviews with panels of key stakeholders: eight school mental health providers/administrators, nine teachers, eight 2nd-5th grade students with ADHD, and eight parents of 2nd-5th grade students with ADHD. The first will evaluate existing school resources and capacities for services and techology use. The second will examine perceptions of existing technology-supported interventions for children with ADHD. The third will solicit feedback on a mHealth-supported intervention protype developed based on stakeholder feedback. Upon completion, focus groups are being transcribed and coded for themes using a rapid assessment procedure for qualitative analysis. Themes from first round focus groups with teachers revealed perceptions of ineffectiveness, uncertainty about accessibility, and inconsistent implementation of services, and unmet child mental health needs. Interviews with school mental health providers/administrators are ongoing and have revealed similar perceptions of inconsistency in service implementaiton and a lack of capacity (e.g., staff) to support services. Themes from second round focus groups with teachers revealed teachers' preferences for mHealth tools that are easy to use, facilitate

communciation among school staff and parents, and minimize intervention burden on teachers. Findings will inform the development of a mHealth supported intervention.

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

Grant Support: This project was funded by a pilot award from the SDSU HealthLINK Center for Transdisciplinary Health Disparities Research (U54 MD012397; MPIs: Ayala/Wells) from the National Institute for Minority Health and Health Disparities.

RADX-UP: DEVELOPING STRATEGIES AND BEST PRACTICES FOR COVID-19 INTERVENTIONS FOR BLACKS/AFRICAN AMERICANS IN THE WASHINGTON D.C. METROPOLITAN AREA

Dr. Carla D Williams - Howard University
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Howard University (CDW, KP, MR-P, JO, KL, CC, PC-N) Be Health Empowered (MC, DH) African Women's Cancer Awareness Association (IN) Grapevine Health (LF)

Abstract

National data demonstrate that Black and Brown communities experienced disproportionate morbidity and mortality from the health crisis brought about by the pandemic spread of SARS-CoV-2 (COVID-19) infections. Washington, DC is among the localities where these inequities are most pronounced. About 46% of DC residents identify as Black or African American. As of February 2022, about 48% of COVID-19 infections occurred among Black residents. However, over 77% of lives lost to COVID-19 were Black DC residents. Potential explanatory factors for this disproportionate morbidity/mortality burden may include inequitable access to quality health care, distrust of government systems, and the many economic and social injustices rooted in systemic racism. In addition, the combination of historical and current events could lead to significant reluctance and/or inability to participate in SARS-CoV-2 testing, clinical research, and vaccination. The overall goal of this study is to assess trust in sources of COVID-19 information, learn strategies to increase participation in COVID-19 interventions, and identify best practices for addressing community concerns and priorities surrounding the pandemic. However, it is essential to conduct research in close partnership with trusted community stakeholders to understand optimal ways of rebuilding community trust in research and healthcare. This presentation will identify barriers and facilitators of building community-academic research partnerships. Effective strategies for community-engaged recruitment of study participants who represent multiple forms of social and ethnic diversity will also be examined.

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

Grant Support: 2U54MD007597-33S1 (Sub-Project 9128)

6.0 - DATA SCIENCE / BIG DATA

MODELING THE MENINGOCOCCAL SIADW MECHANISM OF FUNCTION

Mr. John-Paul Akinbami - Morgan State University
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Morgan State University

Abstract

PURPOSE N. meningitidis is a gram-negative diplococcus human pathogen that has several reported serogroups including A, B, C, W, X, and Y. Serogroups B, C, and Y are mainly responsible for causing this disease in the U.S. It is associated with morbidity and mortality in young children and adolescents, especially in under-resourced communities. This study aims to delineate the mechanisms of function of SiaDW, the N. meningitidis serogroup W capsular polymerase, which is implicated in pathogenesis. METHODS SiaDW structure was modeled with Robetta. Structure validation was conducted with MolProbity. HMMER helped identify sequence homologs of SiaDW while alignment was conducted with Clustal Omega. Schrödinger packages were used for the following: conformational analysis and energy minimization (MacroModel); binding pocket identification (SiteMap); ligand docking (Glide). RESULTS While deviations in Ramachandran scores, bond lengths and angles were identified, the model was reasonable based on an overall MolProbity score of 1.58. Potential binding pockets were identified in both the galactosyl- and sialyl-transferase domains. Substrate docking in the galactosyl transferase (GT) domain with Glide and structural information gleaned from a GT domain homolog revealed a putative substrate orientation consistent with reported biochemical studies. The different N. meningitidis serogroups differ in the capsular hexosyl-residues that can be assembled as homo or heteropolymers of modified and unmodified hexoses. The conserved residues map to sites predicted to be proximal to the active site based on modeling and docking studies. DISCUSSION / CONCLUSION The results presented here have identified the putative active site for UDP-galactose utilization and they are consistent with biochemical literature reports. They confirm and extend our previous studies that focused on the GT domain. Further, based on conformational analysis, they provide insight into substrate binding orientations.

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

Grant Support: This research was funded by the National Science Foundation's Division of Materials Science Biomaterials Program (DMR-BMAT) under grant number 2100978. The authors also acknowledge the support of the National Institute on Minority Health and Health Disparities through grant number 5U54MD013376 and National Institute of General Medical Sciences through grant number 5UL1GM118973. Structural biology applications used in this project were compiled and configured by SBGrid

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PSEUDOBASE++ 2.0: AN UPDATED DATABASE OF CONFIRMED AND PREDICTED PSEUDOKNOTS

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Abstract

PURPOSE Ribonucleic Acid (RNA) secondary structures consist of pattern features that can be classified into two basic categories such as stem-loops and pseudoknots, which are implicated in important biological processes including gene expression and regulation. The original PseudoBase++ (https://rnavlab.utep.edu/database), first published in 2009, offered a searchable database of then confirmed pseudoknots in PseudoBase and presented a user-friendly interface for researchers to search, visualize, and analyze the data. Now we are implementing a new version of this searchable database, PseudoBase++ 2.0, which incorporates new pseudoknots discovered and confirmed in more recent years. METHODS The pseudoknot details are stored in a relational database using MySQL language. The original PseudoBase++ covered the general information on any confirmed pseudoknot including a classification system based on their hairpin and bulge loops. The webserver included visual features of a pseudoknot using the tool PseudoViewer for examining the complex structure of these molecules. In this latest version, we incorporated additional information about the sequences and added more fields for making the search easier. Also, newly predicted pseudoknots using several prediction tools are added from SARS-Cov2 into the database. Then apache server is used to make a connection between the database and the webserver using python scripts. RESULTS PseudoBase++ 2.0 now contains 398 confirmed and two predicted pseudoknots. The front-end of the website allows users to search by any given criteria (e.g. organism, RNA types, length, etc.) and also download the results in a tabular format.

Additionally, it generates the sequences in fasta and dot-bracket forms as well as the connect table (CT) file for the available pseudoknot sequences. CONCLUSION Pseudobase++2.0 will help researchers analyze confirmed and predicted pseudoknot structures using different sequence features and structural information

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

Grant Support: NIMHD-5U54MD007592 to the Border Biomedical Research Center at UTEP.

CHARACTERIZING SAME-LIGAND BINDING TO GPCRS OF DIFFERENT CLASSES

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Abstract

PURPOSE G protein-coupled receptors (GPCRs) are the largest class of membrane receptor proteins which play important role in signal transduction and are often targets for therapeutic purposes. The growing amounts of publicly available data on GPCR-ligand interactions and three dimensional (3D) structures of GPCRs have made GPCR ligand binding prediction a more viable option to high throughput screening and experimental approaches at the initial stages of drug discovery. These predictions are cost-effective and are important aides for planning wet lab experiments to assist in explaining signaling pathways and accelerate drug discovery. However, existing computational tools for GPCR ligand binding prediction have not focused on features that characterize the binding of the same-ligand to GPCRs of different classes. This study aims at uncovering and understanding the binding of the same ligand to multiple GPCRs of different classes. METHODS We conducted a motif search, 3D structural comparison, binding pocket prediction and comparison, ligand docking and alignment, and GPCR ligand atomic interactions of the GPCRs that bind the same ligand to uncover the underlying characteristics. RESULTS The following findings were observed: 1) only a few GPCRs share conserved sequence motif, which is expected, as the GPCRs are classified base on their sequence; 2) GPCRs of different classes share local 3D structural and sequence similarities; 3) GPCRs that bind to the same ligand share similar binding pockets; 4) the ligands may bind with the same conformation but different poses; 5) finally, the ligands bind to similar pockets with similar electrostatic and solvation properties and share similar residues. CONCLUSION These findings reveal similarities among GPCRs in ligand recognition and can be taken advantage of to further improve protein function inference, drug repurposing and drug toxicity prediction, and speed up the development of new drugs.

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

Grant Support: NIMHD-5U54MD007592 to the Border Biomedical Research Center at UTEP

ASSESSING NUTRITIONAL BENEFITS OF FERMENTED GRAINS THROUGH METAGENOMICS

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Abstract

PURPOSE Fermented foods are an essential component of human diet in under-resourced environments where the cold preservation of food is not widespread. While malnutrition and undernutrition are commonly associated with low- and middle-income countries, they also affect under-resourced communities in high-income countries. The purpose of this study was to investigate potential nutrition-enhancing properties in microorganisms associated with traditional cereal fermentation practices. METHODS Using the NCBI SRA sequence database, 16S ribosomal RNA

(rRNA) gene sequencing projects on fermented foods were identified, and the data retrieved for further analysis. Quality analysis was performed with FASTQC, and Operational taxonomic units (OTUs) generated using QIIME2 and DADA2 with Greengenes as the reference database. Metagenomics and pathways analysis were performed with PICRUSt2. Statistical analysis and visualization were accomplished with STAMP. RESULTS/EXPECTED RESULTS The analysis was based on BioProject PRJNA482055, which was a metagenomics study on fermented beverages from Ogun State, Nigeria. The approach differed from the original study in the use of DADA2 pipeline and the Greengenes 16S rRNA database as opposed to SILVA database. Whereas Firmicutes were the dominant phylum in all six samples analyzed, there were significant differences at the family level with three samples having an abundance of Lactobacillaceae, one being dominated by Leuconostocaceae, and one by Clostridiaceae. Pathways for the synthesis of various vitamins were present in the metagenome. DISCUSSION/CONCLUSION The results suggest the need for standardization of fermentation approaches as well as optimization to enrich for nutritionally desired characteristics. Strains of Lactobacillus with B-vitamin producing characteristics have been identified using their genome sequences. The bacteria have the potential to be developed as “vitamin supplier to the host”.

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

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IDENTIFY ACE1 ACTIVE SITE’S CONSERVED WATER FOR DRUG DESIGN

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Jackson State University (HCH, IVO, PBT); University of Texas at Arlington (GMW); University of Mississippi (RJD)

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 / EXPECTED RESULTS: Among the water cluster sites selected (with 4 Å cutoff on cluster diameter) after cluster analysis, some clusters had many water molecules passing and staying only short period of time as analyzed and seen in the MD trajectory frames (not a conserved site). Some clusters had only few water molecules visiting and staying much longer of the time there (for a conserved hydration site). DISCUSSION / CONCLUSION: Much higher affinity inhibitor (or potent drug) for ACE1 can be obtained by incorporating an oxygen (O) atom (in the conserved hydration site) to a weak inhibitor in the ACE1 active site; the new compound with the extra O attached would be more potent to bind to ACE1 due to added O in a conserved position to stick tightly to the active site. 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, Drug Design

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

Grant Support: This research was supported by a Pilot Project grant awarded to Dr. HC HUANG by the National

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MOLECULAR EVOLUTION AND EPIDEMIOLOGICAL CHARACTERISTICS OF SARS COV-2 IN DOMINICAN REPUBLIC

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Abstract

BACKGROUND: The SARS-CoV-2 is an RNA virus that evolves over time leading to new variants. Genomic surveillance of SARS-CoV-2 in the Dominican Republic allows identifying fast-spreading lineages before becoming a public health concern. METHODS: A total of 1,149 SARS-CoV-2 complete genome nucleotide sequences from the Dominican Republic were obtained from the Global Initiative on Sharing All Influenza Database (GISAID) initiative database. Phylogenetic relationships and evolution rates were analyzed using the Maximum likelihood method and the Bayesian Markov chain Monte Carlo (MCMC) approach. The genotyping details (lineages) were obtained using the Pangolin web application. In addition, the web tools Coronapp, and Genome Detective Viral Tools, among others, were used to monitor epidemiological characteristics. RESULTS / EXPECTED RESULTS: The most frequent non-synonymous mutations over the study period was D614G. Of the 1,149 samples, 870 (75.74%) were classified into eight relevant variants according to Pangolin/Scorpio. The first Variants Being Monitored (VBM) was collected in December-2020. Nevertheless, during 2021 the Variants of Concern (VOC) Delta and Omicron were identified. The mean mutation rates were estimated as 1.5523E-3 (95% HPD: 1.2358E-3, 1.8635E-03) nucleotide substitutions per site. DISCUSSION / CONCLUSION: It is evident that each new emerging VOC is more infectious than the preceding one. A better understanding of viral evolution is driven by genetic and ecological factors to adapt to the environment or human intervention, among others, helps us establish strategies to better control viral evolution.

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

Grant Support: National Institutes of Minority Health and Health Disparities (U54MD007579)

COMPUTATIONAL ANALYSIS OF THE EFFECTS OF ACE2 MUTATIONS.

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Abstract

PURPOSE:The Angiotensin-Converting Enzyme-2 (ACE2) is the primary target of the SARS-CoV-1 /SARS-CoV-2 spike (S) glycoprotein enabling entry into the human body. Certain ACE2 genetic variants have gained attention because of their rapid rise within certain populations and evidence of transmission. Genetic variations closely associated with the rise in mortality rates among American Americans need further investigation. We identified multiple ACE2 genetic variations affecting protein stability and binding affinity in these populations which may contribute to infectivity and transmission. The knowledge gained from our research by identifying future targets will promote progress in therapeutics to improve health outcomes of American Americans. METHODS:We applied the structure-based computational saturation mutagenesis approaches to determine free energy calculations caused by genetic variations on ACE2 regions of ACE2 - SARS-CoV-1 S / ACE2 - SARS-CoV-2 S complexes. We also applied structural-based and sequenced-based alignment methods on both complexes to reveal similarities. RESULTS:We observed ACE2 mutations G561, G486, G268, G399 and G405 causing the most destabilizing effects on protein stability. In terms of the mutations affecting binding affinity between ACE2 - SARS - CoV - 1 /ACE2 - SARS - CoV - 2 complexes, ACE2 mutations in residues D355 and D38, decreased the binding affinity between both complexes.

Residue Y41 displayed mixed results by showing an increase of binding affinity in ACE2 - SARS - CoV - 2, while a decrease in ACE2 - SARS - CoV -1 was observed. DISCUSSION / CONCLUSION:In our analysis of ACE2 - SARS - CoV -2, two genetic variations show a decrease binding affinity in African American populations, and increase for ACE2 - SARS - CoV -1. Mixed results are seen with this genetic variation. These are important findings especially during this pandemic as it has significant relevance for at-risk areas for future respiratory infectious disease pandemics.

Category: 6.0 - Data Science / Big Data - 4.01 - Clinical and Translational Science Research - RESEARCH ABSTRACT

Grant Support: This research was supported by the Howard University startup funds and National Science Foundation. This project was supported (in part) by the National Institute on Minority Health and Health Disparities of the National Institutes of Health. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

AUTOMATING THE PROCESSING OF SARS-COV-2 SEQUENCE PROCESSING

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Abstract

PURPOSE: As various SARS-CoV-2 lineages remain a concern for the world, rapid detection of variants of concern is necessary. Next-generation sequencing (NGS) allows for hundreds of samples to be sequenced at a time but generates gigabytes of data and can be slow to process. A reliable and efficient method to process the sequence data is necessary to report the lineages and sub-lineages quickly. METHODS: A published pipeline for identification of SNPs was modified to process the raw Illumina sequences. In short, a python script utilized common NGS tools to first join paired-end reads that are then quality trimmed. Next the reads are mapped to the Wuhan SARS-CoV-2 reference sequence with the human genome as a decoy. Alleles were then called and then filtered to contain only SARS-Cov-2 sequence data. Sequences were then constructed and SARS-CoV-2 variants were then identified using Pangolin. This process was then compared to the SWIFT pipeline developed for the primer sets used in NGS. RESULTS: When comparing with the slower SWIFT pipeline on a smaller group of samples, there was 96% congruence in the sub-lineage assignments and 100% at the lineage level. For samples with greater than 40% genome coverage, the two pipelines had complete agreement. The pipeline was able to determine the lineage of over 200 samples in under 48 hours of receiving the sequence data. DISCUSSION/CONCLUSION: The developed pipeline allowed for an automated processing of the steps to determine the lineage and sub-lineages of samples from the border city of El Paso, TX. Being able to process the raw reads quickly has allowed for identification of the various variants of concern. This pipeline could also be easily modified to use for other viral pathogens, such as influenza, for surveillance purposes.

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

Grant Support: NIH-NIMHD (5U54MD007592) to UTEP’s Border Biomedical Research Center

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EVALUATING OPIOID USE DISORDER CLINICAL TRIAL OUTCOMES

Prof. Gabriel J Odom - Florida International University
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Florida International University (GJO); Columbia University Irving Medical Center & New York State Psychiatric Institute (LB); The University of Miami (GJO, RB)

Abstract

P: In clinical trials testing the efficacy of medications for opioid use disorder (MOUD), there is no consensus on how to define treatment success. This project created a standardized, comprehensive, and codified library of commonly

used clinical trial outcomes for MOUD treatment. Additionally, these treatment outcome definitions were compared empirically based on their sensitivity to race/ethnicity of clinical trial participants. M: We developed a library of 51 treatment outcome definitions as an open-source software package in the R language. To perform empirical analysis, we applied each outcome to each participant in NIDA's benchmark CTN-0094 clinical trials data set for OUD treatment: 3560 participants randomly assigned to one of 3 MOUD options over 8 arms. Using this data set of participant baseline and treatment characteristics, we then measured the presence of statistical information pertaining to participant race/ethnicity contained in each outcome through the Akaike Information Criterion and likelihood ratio tests. R: The R package CTNote is a standardized and clinically relevant library of treatment outcome definitions for OUD clinical trials. Of the 51 outcomes we analyzed, 19 of them (FDR < 0.05) had statistically significant amounts of information related to the race/ethnicity of the trial participants. These results can be used to select treatment outcomes that may be more equitable across racial/ethnic sub-populations for future substance use disorder clinical trials. D: We believe that participant race/ethnicity should not have any effect on participant trial success after controlling for age, gender, socio-economic status, study arm assignment, and baseline polysubstance use. We then consider the following question: if a trial outcome has significant racial/ethnic information, is the outcome itself biased, or does our analysis highlight areas of clinical trial design which need modification to ensure greater equity for racial and ethnic minorities?

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

Grant Support: NIMHD FIU-RCMI Pilot AWD000000009108

PROTEOMICS ANALYSIS OF THE HUMAN BREAST CANCER UNFOLDOME

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Meharry Medical College, Bioinformatics and Proteomics Core (VP, AC, SP); University of South Florida, College of Medicine (VNU)

Abstract

PURPOSE Many proteins lack stable 3D structure due to specific features at the primary amino acid sequence level. These intrinsically disordered proteins (IDPs) and intrinsically disordered regions (IDRs) constitute a substantial portion of human proteome, a subset known as "unfoldome". As the IDPs are often associated with various diseases including cancer, we propose that unfoldome characterization studies would represent a valuable addition to the cancer discovery research. METHODS Our proteomics research utilized MudPIT (Multidimensional Protein Identification Technology) in order to find IDPs differentially expressed in breast cancer BT-549 cell line in comparison with normal human MCF-10A cell line. The method involved initial removal of fully folded proteins with 1.5% trichloroacetic acid followed by IDP precipitation. The IDP analysis consisted of a 10-step MudPIT using biphasic nano-chromatography and an Orbitrap mass spectrometer. RESULTS 2,271 protein groups were identified in the unfoldomic portions of normal and cancerous cell proteomes. Further, 148 IDPs were characterized as significantly differentially expressed proteins (DEPs) in cancer cells (>2 fold, FDR p-value <0.05). Our analysis pipeline annotated 140 DEPs using DAVID Bioinformatics Resources version 6.8, NIAID/NIH. Additional in silico characterization of the DEPs included PONDR-FIT and PONDR VL3 software to find the prevalence of IDRs. 65% (91 of 140) IDPs were related to various non-cancer diseases, and 20% (28 of 140) IDPs were related to cancer by using the GAD_DISEASE database. Most of the DEPs contained long IDRs (>30% of sequence). The IDPs identified in these experiments were classified using major Gene Ontology categories, and pathway analysis was performed using the DAVID interacting genes database. CONCLUSION These results confirmed and further characterized the role of unfoldome and IDPs in the molecular mechanisms of breast cancer.

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

Grant Support: NIH/NIMHD grants to the Meharry RCMI program U54 MD007586 and the Meharry Translational Research Center (MeTRC) U54 MD007593

COMPUTATIONAL MUTAGENESIS OF MERS-SPIKE PROTEIN

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Howard University

Abstract

The recent COVID-19 pandemic has demonstrated the danger that coronaviruses pose to public health. The mortality rates of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and SARS-CoV are ~2-4% and 15%, respectively. However, the lesser-known Middle Eastern respiratory syndrome coronavirus (MERS-CoV) virus has the highest mortality rate, approximately 37%. A key component in the virulence of MERS-CoV is the binding of the spike protein or S-protein to the host receptor, dipeptidyl peptidase 4 (DPP4), which facilitates viral entry. The MER-CoV S-protein binds with the host membrane receptor. We applied a computational saturation mutagenesis approach to investigate the effects of missense mutations in the MERS-CoV spike protein on protein stability and binding affinity with DPP4. We generated 3,876 mutations in the MERS-CoV spike glycoprotein and found that most of these mutations would decrease the stability of the overall S-protein. However, most of the mutations generated in the spike protein had a neutral effect on the binding affinity of the MERS-CoV-spike for its host receptor. We analyzed N-linked glycosylation sites located within the MERS-CoV spike receptor binding domain (RBD). We found that many mutations in these sites were predicted to decrease the overall protein stability of the S protein. Additionally, we generated mutations in the DPP4 and identified several residues that contribute to the binding affinity of the MERS-CoV-2 spike for the DPP4 receptor, including three human variants that have been associated with reduced host entry. These results will provide insight into the S-protein and may be useful in developing vaccines to prevent coronavirus infection.

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

PREDICTION OF MISSENSE MUTATIONS EFFECTS ON HUMAN MYELOPEROXIDASE PROTEIN STABILITY

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Abstract

Myeloperoxidase (MPO) is a heme peroxidase with microbicidal properties. MPO plays a role in the host's innate immunity by producing reactive oxygen species inside the cell against foreign organisms. However, there is little functional evidence linking missense mutations to human diseases. We utilized in silico saturation mutagenesis to generate and analyze the effects of 10811 potential missense mutations on MPO stability. Our results showed that ~71% of the potential missense mutations destabilize MPO, and ~8% stabilize the MPO protein. We showed that G402W, G402Y, G361W, G402F, and G655Y would have the highest destabilizing effect on MPO. Meanwhile, D264L, G501M, D264H, D264M, and G501L have the highest stabilization effect on the MPO protein. Our computational tool prediction showed an increase in the folding energy change in 13 out of 14 missense mutations that cause diseases in humans. We also analyzed putative post-translational modification (PTM) sites on the MPO protein and mapped the PTM sites to disease-associated missense mutations (SNP) for further analysis. Our analysis showed that R327H and R548W are near PTM sites and are associated with frontotemporal dementia (FTD) and generalized pustular psoriasis (GPP), respectively. Our results will aid further research into MPO as a biomarker for immune disorder in humans or as a candidate for drug target discovery.

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

SUBSETTING DATA REVEALS DIFFERENCES IN TUMOR MUTATION BURDEN

Ms. Sanjana Sundara Raj Sreenath - Other
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Texas Tech University Health Sciences Center – El Paso (SSS), University of Texas at El Paso (JEM)

Abstract

PURPOSE: Acute lymphoid leukemia (ALL) is a malignancy caused by uncontrolled proliferation of immature B or T lymphocyte precursors. Epidemiological studies have found increased ALL mortality in Hispanic Americans. The purpose of this study is to leverage open Application Programming Interfaces (API) data to explore differences in tumor mutation burden (TMB) in Acute Lymphoblastic Leukemia Hispanic and non-Hispanic patient subsets. METHODS: Clinical and demographic data was obtained for each patient by making API calls to the Genomics Data Common (GDC) endpoint by requesting fields of interest while applying filters specific for the TARGET-ALL-P2 study. Variant call formatted (VCF) files containing mutational data from GDC were downloaded and fed into the UTEP's OncoMiner pipeline. Mutations in coding regions of genes were considered for this study. For each patient, a list of genes along with their individual tumor mutation burden was constructed. Differences in TMB subsetted by clinical and demographic data were analyzed. Data processing and statistical analysis was done using an in-house Python script incorporating Pandas, Numpy and Scipy. RESULTS: 534 patients (20.2% Hispanic, 79.6% non-Hispanic) were included in the study. Mean TMB between Hispanic and non-Hispanic groups were significantly different with significant differences between male Hispanic vs male non-Hispanic TMB. Further, Hispanic vs non-Hispanic B cell specific TMB differences were significant. No significant differences between female TMB values or general B cell TMB values were observed. DISCUSSION/CONCLUSION: Comparisons revealed important differences in TMB values between the two groups. While overall mean TMB values were lower in the Hispanic subgroup compared to non-Hispanic, comparing B-cell TMB values across the two groups revealed a higher mean TMB in the Hispanic group. An in-depth understanding of these group differences could significantly impact ALL prognosis and treatment options.

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

Grant Support: NIH-MIMHD (5U54MD007592) to UTEP's Border Biomedical Research Center

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GENE VARIANTS IN PUERTO RICAN PATIENTS WITH ANXIETY AND DEPRESSION

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University of Puerto Rico at Medical Sciences Campus (BTH, JRT, JDS); University of Puerto Rico at Rio Piedras (FVU)

Abstract

PURPOSE: This study aims to determine the most frequent genetic variants occurring in patients with anxiety and depressive symptoms and their influence on the effectiveness of pharmacological treatments and psychotherapies in these patients. We hypothesized that patients who carrier multiple polymorphisms will have severe symptoms at the time of the diagnostic and will require longer treatments than those with fewer variants. METHODS: We are recruiting third-generation Puerto Rican patients diagnosed with anxiety and/or depression from the Medical Campus Psychiatric Clinics. After discussing and signing the written informed consent, samples were collected using buccal swabs, and then DNA was extracted using the QIAcube®. Genotyping was performed using the Infinium® Multi-Ethnic AMR/AFR Bead Chip. RESULTS: Up to now, we have twenty patients consented with the sample collected. Preliminary analysis (n=8) identified a total of 13,353 variants across the genome associated with anxiety and depression. A CORE analysis was conducted to identify variants associated with anxiety and depression and the pathways related to the variants mapped to genes. In this analysis, 643 pathways were identified. These genetic data will be evaluated, along with clinical data extracted from health records, to determine if there is an association between symptom severity, treatment response, and the presence of specific genetic variants. CONCLUSION: This research project will help us determine what genes and genetic variants are significantly associated with anxiety and

depressive symptoms in Puerto Ricans. Also, we will develop a polygenic risk score to predict the likelihood of severe symptoms of anxiety and depression or treatment failure. This score will consider the prevalence and effect size of unique genetic variants present in Puerto Ricans. The results will give us insight into what genes are more relevant to anxiety and depression in our population.

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

Grant Support: COBRE II: Center for Neuroplasticity at the University of Puerto Rico 5P20GM103642 and NIMHD-RCMI U54 MD007600 from the National Institute on Minority Health and Health Disparities

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PAN-CANCER ANALYSIS IDENTIFIES TOMM40 AS AN IMMUNOLOGICAL AND PROGNOSTIC BIOMARKER

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Abstract

Translocase of outer mitochondrial membrane 40 (TOMM40) is the channel-forming subunit of the translocase of the mitochondrial outer membrane (TOM) complex, which is indispensable for the import of protein precursors into mitochondria. TOMM40-related diseases include early-onset autosomal dominant Alzheimer's disease and mild cognitive impairment. Although more and more evidence supports that TOM40 plays a vital role in the occurrence of some cancers, there is no systematic pan-cancer analysis of TOM40. Therefore, our goal is to explore the prognostic value and potential immunological function of TOMM40 in 33 cancer types. we used a series of bioinformatics methods to explore the potential carcinogenesis of TOMM40, including analyzing the relationship between TOMM40 and the prognosis of different tumors, tumor mutational burden (TMB), microsatellite instability (MSI), DNA methylation, and immune cell infiltration. We demonstrated that TOMM40 was highly expressed in most tumors (30 out of 33 tumors). In addition, TOMM40 is positively or negatively correlated with the prognosis of different cancers. Interestingly, the expression of TOMM40 was related to TMB and MSI in 8 kinds of cancers, while its expression was associated with DNA methylation in 19 kinds of cancers. We screened out six tumors, including breast invasive carcinoma, cervical squamous cell carcinoma, endocervical adenocarcinoma, kidney renal clear cell carcinoma, lung squamous cell carcinoma, skin cutaneous melanoma, and stomach adenocarcinoma, and found that the gene expression of TOMM40 was negatively correlated with the infiltration levels of most immune cells, and positively correlated with the infiltration levels of Neutrophil and Monocyte. Furthermore, the correlation with TOMM40 expression varies with T cell subtypes. Together, our research shows that TOMM40 can be used as a prognostic marker for various malignant tumors owing to its role in tumorigenesis and tumor immunity.

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

Grant Support: 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.

POLYGENIC BASIS OF RACIAL DISPARITY IN PROSTATE CANCER

Dr. Kun Zhang - Xavier University of Louisiana
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Xavier University of Louisiana

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 ($p<3\times10-9$); 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 ($p < 7\times10-5$); 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 - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: 5U54MD007595

7.0 - HEALTH AND HEALTHCARE POLICY RESEARCH

HARMONIZED POLICIES CALL FOR HUMANITY AND ECOSYSTEMS HEALTH

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EL NEGRON
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Abstract

PURPOSE: The global burden of disease attributable to Non-Communicable Diseases (NCDs) and emerging infectious diseases like the COVID-19 pandemic has carried substantial costs to the healthcare system and averted the attainment of optimal people's health and well-being. Summed to this setting are the war conflicts in recent decades that have caused severe ecological disturbances and people's loss of human rights. The purpose of this study was to be comprehensive of the intersections and influences between the social, environmental, and economic systems on public health. METHODS: A systematic literature review aimed to show how in most of the world, those systems have been transformed significantly due in part to ongoing globalization (in terms of health, ethics, equities, sustenance) and the economic crises in many countries. RESULTS: The economic sustainability crisis reveals that a strong per capita gross domestic product (GDP) indicator does not necessarily signify that an economy is 'healthy' or that the quality of life for individuals is improving. Even though growth in GDP per capita is a key driver of average household disposable income, assessment of economic performance should no longer be limited to the lens of GDP alone. Additionally, warfare effects have brought vast environmental disturbances that will remain uncertain for many years, probably long-term, unless natural or human-mediated remedial processes can restore the ecosystems. DISCUSSION / CONCLUSION: The sustenance of humanity is determined mainly by the Earth's ecological and biophysical systems. On the other hand, pollution of those ecosystems subtracts healthy years from the lives of adults and children. These findings call to advance the United Nations 2030 Sustainable Development Goals (SDGs) globally. The SDGs address the social, environmental, and economic factors that influence health and inequalities in health. In turn, it advises how those factors benefit from a healthy population.

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

8.0 - HEALTH RELATED TECHNOLOGY APPLICATION

NANOPROBE MEDIATED NON-INVASIVE IMAGING OF CARDIOTOXICITY

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Abstract

Chemotherapy-induced cardiac toxicity is an unwanted yet very common effect, that can increase the risk of death and reduce the quality of life of individuals undergoing chemotherapy. However, no feasible methods and techniques are available to be able to monitor and detect the degree of cardiotoxicity at an early stage. Therefore, in this project, we aim to develop a fluorescent nanoprobe to image the toxicity within cardiac tissue induced by anticancer drug. We have observed that Vascular Cell Adhesion Molecule 1 (Vcam1) protein alone with collagen were overly expressed within the heart when an animal is treated with doxorubicin (DOX), because of inflammation within the epithelial cells. We hypothesize that developing a Vcam1 targeted peptide based (VHPKQHRGGSKGC) fluorescent nanoprobe can detect and visualize the affected heart. In this regard, we prepared a poly (lactic-co-glycolic acid) (PLGA) nanoparticle linked with Vcam1 peptide and rhodamine B (PLGA-VCAM1-RhB). Selective binding and higher accumulation of the PLGA-VCAM1-RhB nanoprobes were detected in DOX treated Human Cardiomyocyte Cells (HCM) compared to the untreated cells. For in vivo studies, DOX (5 mg/kg) was injected via the tail vein once a week for 3 weeks. PLGA-VCAM1-RhB and PLGA-RhB were injected via the tail vein after one week of the last dose of DOX, and images were taken 4 hr of post-administration. We have observed a higher fluorescent signal of PLGA-RhB-VCAM-1 (48.62%±12.79%) in DOX-treated animals compared to the control PLGA-RhB (10.61%±4.90) within the heart, indicating specificity and targeting ability of the PLGA-VCAM1-RhB to the inflamed tissues. The quantified fluorescence intensity of homogenized cardiac tissue of PLGA-RhB-VCAM1 showed 156% higher intensity than the healthy control group. We conclude that PLGA-VCAM1-RhB has the potential to bind inflamed cardiac cells, thereby detecting DOX-induced cardiotoxicity and damage heart at an early stage.

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

Grant Support: Lizanell Colbert Coldwell Foundation

PREDOMINANTLY IGG4 ANTI-THSD7A AUTOANTIBODIES WEAKLY ACTIVATE COMPLEMENT VIA THE ALTERNATIVE PATHWAY IN MEMBRANOUS NEPHROPATHY

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Abstract

Membranous nephropathy (MN) is an immune kidney disease characterized by glomerular subepithelial immune complexes containing antigen, IgG, and products of complement activation. Whereas proteinuria is thought to result from complement-mediated podocyte injury, the pathways of complement activation remain controversial due to the predominance of IgG4 in immune complexes, the IgG subclass least able to activate complement. THSD7A, a transmembrane protein expressed in podocytes, is the target autoantigen in about 3% of cases of primary MN. In this study, we analyzed sera from 16 patients with THSD7A-associated MN with regard to the subclasses of anti-THSD7A autoantibodies and their ability to fix complement in vitro. As a relative proportion of all IgG anti-THSD7A, IgG4 was by far the most abundant subclass (median 79%), followed by IgG1 (median 11%), IgG2 (median 3%) and IgG3 (median 2%). IgG4 was the dominant subclass of anti-THSD7A antibodies in 14 sera, while IgG1 was dominant or co-dominant in two sera. Five MN sera additionally contained anti-THSD7A IgA, mainly of IgA1 subclass, albeit at

low levels than IgG autoantibodies. Immune complexes formed by anti-THSD7A autoantibodies with immobilized THSD7A were poor activators of complement in vitro. Only three sera with the highest titer of anti-THSD7A autoantibodies, which were IgG4-dominant, exhibited significant ability to fix complement. Complement fixation by anti-THSD7A autoantibodies was abolished in factor B-depleted sera, but not in C1q-depleted sera. These results imply that immune complexes formed by THSD7A with excess IgG4 autoantibodies can fix complement via the alternative pathway. Additional factors yet to be defined may also contribute to pathogenic complement activation in THSD7A-associated MN.

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

Grant Support: Meharry Research Centers in Minorities Institutions (RCMI) grant U54MD007586, U54MD007593 from the NIMHD, Award W81XWH-20-1-0698 (grant number LR190150) from the Lupus Research Program of the Department of Defense, Institutional funding for the Glomerular Disease Center, Boston Medical Center

9.0 - RESEARCH IN SPECIAL POPULATION SUB-GROUPS

PLASMA ET-1 LEVELS IS A NON-PREDICTOR OF ALZHEIMER'S DISEASE

Prof. Donald James Alcendor - Meharry Medical College
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Abstract

PURPOSE: Alzheimer's disease (AD) and related dementias (ADRD) disproportionately impact racial and ethnic minorities. Contributing biological factors to explain this disparity has been elusive. Even more, non-invasive biomarkers for early detection of AD are needed. Endothelin-1 (ET-1), a vasoconstrictive factor linked to cerebral vascular disease pathology and neuronal injury, could provide information to better understand racial disparities in AD. As a potent vasoconstrictive peptide that regulates smooth muscle, endothelial cell, and pericytes contractions, ET-1 may result in cerebral vascular constriction leading to cerebral hypoperfusion; over time, this may result in neuronal injury contributing to the pathology of AD. The role of the ET-1 system as a driver of ethnic disparities in AD requires further investigations. In the United States (U.S.), ET-1 dysregulation in Hispanic/Latinx (H/L) populations largely has been unexplored. In this study, we examine the role of ET-1 protein presence in human plasma as a potential biomarker with predictive value correlating with development of AD by age, race, and sex. METHODS: We examined ET-1 protein levels by quantitative mass spectrometry in AA and NHW patients with AD, along with controls. RESULTS/EXPECTED RESULTS: Partial correlation of age at draw and ET-1 stratified by race and sex, while controlling for AD status, was significant for female AAs ($r = 0.385$, $p = 0.016$). When the data was not stratified but controlled for AD status, partial correlation between age at draw and ET-1 was not significant ($r = 0.108$, $p = 0.259$). DISCUSSION/CONCLUSION: Based on the small number of plasma specimens and no plasma specimens from H/L individuals with AD, we conclude that ET-1 clearly was not a significant factor in predicting AD in this study and will require a larger scale study for validation.

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

Grant Support: GRANT SUPPORT: D.J.A. was supported by the Research Centers in Minority Institutions (RCMI) program grant (U54MD007586-01 and 3U54MD007586-34S1). M.T. and D.W. were supported by RCMI grant (U54MD007586).

LIFETIME TRAJECTORIES OF INDIGENOUS PEOPLE WHO INJECT DRUGS

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Abstract

PURPOSE There is a syndemic of Hepatitis C Virus (HCV) and opioid use disorder (OUD) among Indigenous people in the United States. Indigenous people who use injection drugs (IPWIDs) experience elevated risks for HCV, OUD, and their harmful consequences. This pilot study aims to assess the use of life history calendars (LHCs) to measure sequences of substance use among 40 Assiniboine and Sioux IPWIDs, and to elucidate affinity typologies in substance use sequences. METHODS IPWID perspectives regarding biospecimen collection will be characterized, the validity of lifetime recall of substances used via LHCs will be explored, and the process of LHC administration with IPWID participants and LHC interviewers will be examined. Social sequence analysis will be used to examine IPWID substance use sequences over the life course. EXPECTED RESULTS It is expected that IPWIDs will report low knowledge and high hesitancy regarding biospecimen collection, and that more lifetime substances reported via the Addiction Severity Index will be associated with more lifetime substances reported via the LHC. It is also expected that opioid use will increase the probability of transitioning to injection drug use during the life course. DISCUSSION Findings will contribute an understanding of patterns in IPWID substance use sequences over the life course. This includes identifying factors associated with the probability of transitioning to injection drug use and understanding multiple substance use patterns among IPWIDs. GRANT SUPPORT This research is supported by the National Institute On Minority Health and Health Disparities of the National Institutes of Health Under Award Number NIMHD (U54MD012393), Florida International University Research Center in Minority Institutions.

Category: 9.0 - Research in Special Population Sub-Groups - 9.07 - Indigenous Populations - RESEARCH ABSTRACT

Grant Support: This research is supported by the National Institute On Minority Health and Health Disparities of the National Institutes of Health Under Award Number NIMHD (U54MD012393), Florida International University Research Center in Minority Institutions.

DEVELOPING THE AINA CONNECTEDNESS SCALE FOR HEALTH RESEARCH

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University of Hawaiʻi at Mānoa (MCA), Ke Ola O Ka ʻĀina Research Team and Thought Partners (KOOKA)

Abstract

PURPOSE From a Native Hawaiian worldview, optimal health is achieved by being pono (righteous) and maintaining lōkahi (balance) among the physical, mental, social, and spiritual ways of being. Health extends to include one's relationship with kānaka (humankind), ʻāina (land from mountains to sea, that which feeds) and akua (spiritual realm). The purpose of this study is to explore the role of ʻāina connectedness in Native Hawaiian health and resilience to inform the development of the ʻĀina Connectedness Scale for Health Research. METHODS Key informant interviews and focus groups were conducted with 40 Native Hawaiian community members and leaders throughout Hawaiʻi. Findings from the interviews, supplemented with a scoping review of land, environmental, nature, and cultural connectedness measures led to the development of the ʻĀina Connectedness Scale. RESULTS Three themes emerged: 1) ʻĀina is everything, and therefore, we as people are ʻāina, 2) Connection to ʻāina is important to health and stems from genealogy, respect, and kuleana (deep responsibility), and 3) Intergenerational health and resilience of communities is reflected through intergenerational knowledge about ʻāina. These themes informed the development of the novel ʻĀina Connectedness Scale, which examined the degree to which people feel connected to ʻāina; barriers and facilitators of connecting with ʻāina; and ways of knowing, beliefs, practices, and traditions related to ʻāina. Cognitive interviews provided validity evidence for the ʻĀina Connectedness Scale. DISCUSSION The link between ʻāina connectedness and health may address concerns related to health disparities that stem from historical trauma and environmental changes by bettering our understanding of Native Hawaiian health and fostering stronger ties to land.

Resilience and ʻāina-based approaches to health have been endorsed by Native Hawaiian communities and are detrimental to interventions that aim to improve Native Hawaiian health.

Category: 9.0 - Research in Special Population Sub-Groups - 9.07 - Indigenous Populations - RESEARCH ABSTRACT

Grant Support: The study described was supported by award number U54MD007601 by the National Institute on Minority Health and Health Disparities of the National Institutes of Health.

RACISM-RELATED DIMINISHED RETURNS AND BRAIN DEVELOPMENT DISPARITIES IN THE UNITED STATES: ANALYSIS OF THE ABCD DATA

Dr. Shervin Assari - Charles R. Drew University of Medicine and Science
Shervin Assari and Vickie Mays
Charles R Drew and UCLA

Abstract

Most of the existing literature on the link between racism and brain development has traditionally focused on the effects of individual- or family-level indicators such as socioeconomic status (SES), stress, and discrimination as primary drivers of racial and ethnic disparities in brain development. For this study, we used data from Adolescents' Brain and Cognitive Development (ABCD) to study how structural racism contributes to racial/ethnic disparities in children's brain development in the United States, above and beyond the individual- and family- level SES. Participants included 11870+ children ages 9/10 who were followed for up to three years. ABCD recruited and followed children from 21 cities that were located across 15 US states. Outcomes were functional and structural MRI data of the brain conducted every two years. Our results documented racism-related diminished effects of SES indicators on brain development of Latino, Asian, and Black American children compared to non-Latino White children. For example, the effects of age and SES indicators on the size and function of the amygdala, thalamus, hippocampus, and cerebral cortex function and structure tended to be weaker for the majority of racial/ethnic participants. One of the ways in which structural racism operates is by reducing the protective effects of SES on children's brain development. Interventions must go beyond individual and family level racism to social policies that eliminate contributes to structural racism in order to allow racial/ethnic minorities to thrive and achieve their highest potential. Research on the ways in which capacity of brain plasticity is impacted by the stressful experiences of structural racism are nascent and starting to emerge.

Category: 9.0 - Research in Special Population Sub-Groups - 9.02 - Child and Adolescent Health - RESEARCH ABSTRACT

BARRIERS AND FACILITATORS TO ATTENDING AND BEING PHYSICALLY ACTIVE DURING RECREATION TIME AMONG WOMEN INCARCERATED

Dr. Ricky Camplain - Northern Arizona University
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Northern Arizona University (RC, HJW, TAP, SS, BR)

Abstract

Purpose: The purpose of this study was to determine barriers and facilitators to attending and being physically active during recreation time (rec-time), a time dedicated to being physically active, outside, among women incarcerated in jail. Methods: We recruited and distributed a cross-sectional questionnaire to 100 women incarcerated at the Coconino County Detention Facility (CCDF) in Flagstaff, Arizona from March to July 2020. Women were asked about their experience with rec-time at CCDF, including if they had ever attended, how often they attended, if they exercised at rec-time, activities they participated in, and motivators, barriers, and benefits to attend rec-time. Results: Among 99 women who completed the questionnaire, 89% had ever attended rec-time. Most women identified environmental- and health-related motivators to attending rec-time including enjoying natural light (74%), getting fresh air (83%), a change in environment (62%), and to move around and exercise (72%). Many women indicated environmental-,

equipment-, clothing, and motivation-related barriers to attending rec-time. Specifically, women believed there was a lack of equipment (56%) and limited access to proper footwear (49%). Discussion/Conclusion: As health and environment are important motivators and barriers to being physically active among women I jail; it is important to identify appropriate environmental and policy interventions to increase the use of rec-time and physical activity. If a correctional facility does not offer rec-time or a similar alternative, one should be established and accessible. Creating an environment that is welcoming and conducive to being physically active in is imperative. To improve self-efficacy and safety, sneakers should be proved at no cost. Finally, women not knowing what to do during rec-time indicates that women may benefit from more structured physical activity programs or guidance on physical activities in their space.

Category: 9.0 - Research in Special Population Sub-Groups - 9.06 - Incarcerated Populations - RESEARCH ABSTRACT

Grant Support: U54MD012388

DOUBLE JEOPARDY AND SEXUAL RISK BEHAVIOR AMONG LGB-POC

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CC CARMACK; TM Coleman
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Abstract

PURPOSE: “Double jeopardy” is the plausibility that members of multiple minority groups experience compounded psychological distress beyond that of members who belong to a single minority group. We tested the double jeopardy hypothesis applied to sexual risk behavior among young adult persons of color (POC) who identify as gay, lesbian, or bi-sexual (LGB), attending a minority-serving institution of higher education. Specifically, we hypothesized that LGB-POC would show a greater likelihood of sexual risk behavior, compared to POC who did not identify as LGB, or LGB who were not POC. METHODS: Young adults who identified as LGB and/or POC (N=333), ages 18-26 (M=21, s=1.6), participated in an online survey about sexual health and sexual behavior on the college campus. Participants completed a 63-item measure that included three sexual risk-related behaviors: consistent condom use, sex under the influence of drugs or alcohol, and multiple concurrent sexual partners. Approximately 21% (N=70) identified as both LGB and POC; 61% (N=202) identified as POC (African American, Hispanic (any race), Asian, Other); and 18% (N=61) reported LGB only. RESULTS: A logistic regression was conducted to determine each group’s odds of engaging in each risk behavior. Controlling for age, gender, and classification, POC were 1.5 times more likely to have sex under the influence of drugs or alcohol than LGB only; and LGB-POC were 1.8 times more likely to have sex under the influence of drugs or alcohol. Likewise, POC were 1.2 times more likely to engage with multiple concurrent sexual partners and LGB-POC were 2.9 times more likely to engage with multiple concurrent sexual partners. There was no significance concerning consistent condom. CONCLUSION: Results imply that more research is needed to understand the compounded impact that sexual orientation and race/ethnicity identification may have on sexual risk behavior.

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

RACE AND SEX-BASED DISPARITIES AFTER LOWER LIMB AMPUTATION

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Florida International University (SMC, ZB, MDR), Northwestern University (KNK), University of Nevada, Las Vegas (SPL)

Abstract

PURPOSE There are well-known disparities in amputation rates, with people of color experiencing more lower limb amputations, likely due to the prevalence of dysvascular disease in these populations. However, no study has examined if race/ethnic differences exist in functioning after LLA. Furthermore, little research has focused on functional outcomes of females versus males with lower limb amputation. The purpose of this study was targeted recruitment of a diverse study sample to investigate racial/ethnic and sex-based disparities in prosthetic outcomes. METHODS Cross-sectional study of English and Spanish speaking people with dysvascular lower limb amputation recruited at multiple sites in Florida and Nevada. Participants were administered surveys to assess mobility, self-efficacy, and socioenvironmental aspects. Additionally, participants underwent performance-based outcomes of prosthetic mobility. RESULTS Forty-nine participants (n=19 females, n=22 persons of color) completed all study outcomes. There were no differences in age between groups. Despite the lack of statistical significance of some findings, results trended poorer for females and people of color in all outcomes with associated moderate to very large effect sizes. Women of color (n=8) consistently performed the worst. DISCUSSION This is the first study to examine prosthetic outcomes focused on collecting in-person, performance-based data in a diverse sample of people with lower limb amputation. Despite the small, heterogenous sample of this pilot study, differences in prosthetic functioning based on sex and race/ethnicity were exposed. The results of this study fill gaps in the prosthetic literature regarding recovery after amputation in women and people of color. These results provide the foundation for future research in a larger sample to further investigate factors that influence prosthetic outcome disparities.

Category: 9.0 - Research in Special Population Sub-Groups - 9.10 - People with Disabilities - RESEARCH ABSTRACT

Grant Support: National Institute On Minority Health and Health Disparities of the National Institutes of Health Under Award Number NIMHD (U54MD012393), Florida International University Research Center in Minority Institutions

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COVID-19 VACCINE OUTREACH IN SOUTH LOS ANGELES AND SKID ROW

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Abstract

PURPOSE COVID-19 is currently having a devastating impact among racial/ethnic minority populations in the United States. The goals of the research study were to provide COVID-19 screening and educational outreach targeting homeless populations residing in Service Planning Area 6 (SPA 6) and Skid Row in Los Angeles County. There are three aims to the study: 1. Provision of COVID-19 screening, 2. Development of culturally appropriate educational materials, and 3. Identifying “Best Practices” for reaching homeless populations. METHODS After obtaining IRB approval, two sites in SPA 6 and Skid Row were identified to recruit and administer three (3) questionnaires targeting homeless individuals, aged 18 to 80; 150 African Americans and 150 Latinx. The surveys consisted of a COVID-19 community needs assessment, a COVID-19 Knowledge, Attitudes, Beliefs and Behavior survey and the PHQ 9 Mental Health survey. RESULTS To date, a total of 115 homeless individuals have been recruited into the study. Some of the “Best Practices” included 1. Partnering with a local Community-Based Organization (CBO) which had a history working with homeless populations, 2. Establishing a Community Advisory Board (CAB) with representatives from the target population, 3. Incentivizing study participation, 4. Integrating the research study into existing programming the partnering CBO was engaged in, 5. Using Social Media and “word-of-mouth” to promote the research study, and 6. Involving respected and trusted researchers to direct the study. DISCUSSION Homeless racial/ethnic minorities living in SPA 6 and Skid Row readily sought out participation in the COVID-19 research study. In addition to incentivizing their participation, the participants were very familiar with the CBO engaged in the study as well as had received services from the researchers engaged in the study in the past several years.

Category: 9.0 - Research in Special Population Sub-Groups - 9.04 - Homeless Populations - RESEARCH ABSTRACT

Grant Support: This research study is being supported by grant number 3U54MD007598-12S5 of the NIMHD and the AXIS Pilot Demonstration Study.

BARRIERS TO COVID-19 CONTACT TRACING IN POOR NEIGHBORHOODS, NC

Dr. Irene A Doherty - North Carolina Central University
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Julius L. Chambers Biomedical Biotechnology Research Institute (IAD, WP, LB, VB, DK); Department of Mass Communications (LP, TZ); Department of Nursing (BB); Department of Pharmaceutical Sciences (TL, DK); Department of Public Health Education (SR)

Abstract

PURPOSE: When the COVID-19 pandemic first emerged, large scale contact tracing (CT) was put forth as a viable means to stymie transmission. Health departments nationwide built up a large work force to perform CT. The success of CT (excluding apps) rests in part on individuals reporting their contacts. Ingrained and historically validated distrust of the government and medical establishment among Blacks in the southeastern US creates barriers for many health disparities and may include performing CT. This analysis assessed COVID-19 CT in historically marginalized populations in North Carolina. METHODS: Between September 2020 – December 15 2020, we distributed self-administered surveys at COVID-19 testing events held in venues in low income neighborhoods in predominately rural, NC counties. After describing contact tracers' job, the survey asked if respondents would speak to one, and whether they would reveal all, some, or none of the names of their close contacts. RESULTS: The 385 respondents comprised Blacks(61%), Whites(26%) and Latinx(13%), female (66%), and rural county residence(85%). 55% reported they would speak to a contact tracer. 11% and 17% would reveal none and some of their contacts, respectively; 46% would reveal the names of all contacts; 27% skipped it. Whites and Blacks (49%) were equally likely to report all contacts in contrast to Latinx (22%). Lower likelihood of reporting all contacts included ≤high school/GED (38%), <$20000 income(36%), 18-24 years(35%), uninsured(38%), rural county(52%). Those who trusted health care providers(61%), health department(72%) and community services(70%) were more likely to report all contacts. Vaccine hesitancy/distrust was not correlated. CONCLUSION: While CT is not used for COVID-19 currently, this analysis shows that CT success in poor rural communities in the south is compromised unless trusted community resources can communicate its importance and mobilize for future public health emergencies.

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

Grant Support: Funding is from the North Carolina Coronavirus Relief Fund established and appropriated by the North Carolina General Assembly. Grant U54MD012392 from the National Institutes of Health funded D.K.

ANALYSIS OF CANCER KNOWLEDGE, ATTITUDES, AND PRACTICES (KAP) IN ADOLESCENTS AND YOUNG ADULTS IN TWO TEXAS RURAL COMMUNITIES.

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Abstract

Background. The Youth and Young Adults Cancer Knowledge (C-KAP) exploratory study documented knowledge, attitudes and practices of cancer from the perspective of youth and young adults in two rural underserved communities in a border community. The adolescent, youth, and young adult population (AYAs) face a greater burden than any other age group with around one million new cancer diagnoses worldwide annually. C-KAP is an interdisciplinary research pilot project led by university scholars in partnership with community partners. Methods. The study was intended to take place face-to-face in the spring of 2020, however, due to the COVID-19 pandemic, the investigation transitioned to an online modality. The exploratory cross-sectional mix-method study recruited 141 youth and young adults (ages 18-39). A bilingual online questionnaire was field-tested, and data was collected via QuestionPro Software. Quantitative analysis was conducted using SPSS version 26. Descriptive statistics and frequency analysis were used for demographics and basic statistics. Chi squares tests and Fisher's exact tests between variables were ran to find statistically significant associations. For the qualitative data, independent coders conducted the recurrent

content analysis. Results. Salient themes include knowledge about cancer types, access to health care, prevention, and the perceived impact of the COVID-19 pandemic. Conclusion. Findings highlight a lack of knowledge and orientation on cancer in youth and young adults suggesting the need for community tailored education and screening interventions to advance the prevention and early detection.

Category: 9.0 - Research in Special Population Sub-Groups - 9.02 - Child and Adolescent Health - RESEARCH ABSTRACT

Grant Support: This work was supported by Grant 2U54MD007592 from the National Institutes on Minority Health Disparities (NIMHD) a component of the National Institutes of Health (NIH).

PREPARING MINORITY YOUNG ADULTS TO BE CHANGE-AGENTS IN THE BATTLE AGAINST COVID-19

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Abstract

INTRODUCTION. In 2020, Mississippi's African American young adults were among those with the highest COVID-19 infection rates. Apart from the pathophysiologic effects of the virus, they experienced depression and anxiety and faced unique non-medical issues such as the closure of universities, shift to remote work and learning, and job loss. Affected greatly, many young adults expressed that they felt left out of the discussions surrounding COVID-19. PURPOSE. The purpose of the research was to evaluate the Young Adults Against COVID-19 (YAACOV) Young Ambassadors Training. The Young Ambassadors Training was designed to prepare young adults, ages 18 -29 years old, to identify, interpret, and disseminate accurate COVID-19 health information and to foster trust and drive engagement among their peers and the public via digital platforms and social media. METHODS. Young adults recruited from across Mississippi participated in a 45-minute online training session covering topics such as COVID pathology, sources for COVID information, using social media to engage peers, and working with health practitioners and experts. Young Ambassadors are equipped with study-approved content and messages for weekly posting to their social media platforms, required to submit bi-weekly evaluation forms for reporting the number of posts, likes, reposts, and comments, and recruit a minimum of 25 peers to attend the COVID Talk virtual webinars occurring during March – May 2022. EXPECTED RESULTS. The nine Young Ambassadors are expected to engage more than 200 young adults across the state, providing them with accurate COVID-19 information to support healthy behaviors. DISCUSSION. The Young Ambassadors' input can inform future public health interventions and outreach targeting this hard-to-reach population.

Category: 9.0 - Research in Special Population Sub-Groups - 9.02 - Child and Adolescent Health - RESEARCH ABSTRACT

Grant Support: This research was, in part, funded by the National Institutes of Health (NIH) Agreement OT2HL158287. The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the official policies, either expressed or implied, of the NIH.

WOMEN WHO ARE INCARCERATED: EXPLORING THE RELATIONSHIP BETWEEN INTIMATE PARTNER VIOLENCE AND HIV PREVENTION SELF-EFFCACY

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Abstract

Purpose: Victims of intimate partner violence (IPV) are at a higher risk for engaging in HIV risk behaviors. Women experiencing IPV may have limited capacity to control their sexual circumstances with their partner and therefore demonstrate lower HIV Prevention self- efficacy. Women who experience incarceration are also likely to report experiencing IPV. The current study examines the relationship between intimate partner violence (IPV) and HIV prevention self- efficacy among women experiencing incarceration. Methods: A secondary analysis was conducted using data from baseline surveys from the Women's Health Intervention Study (WHIS), an HIV prevention education intervention for women who were incarcerated. IPV was measured with two dichotomous questions examining participants' history of sexual coercion and physical abuse. Participants were asked ""Has any partner ever forced you to have sex when you did not want to?"" and by ""Has a partner that you were involved with ever hit you."" HIV prevention self-efficacy was measured using a 12-item scale, with responses ranging from 1 to 5 (1 being “not at all”, 5 being “completely sure I can”). Results: The sample consisted of 172 women, who were < 21 years old. Approximately 37% of participants reported experiencing sexual coercion and 51% reported experiencing physical abuse. The mean HIV prevention self-efficacy score was 40.4 (SD= 6.7), indicating somewhat high HIV prevention self-efficacy. There was a significant difference in HIV prevention self-efficacy (p=.000) between those who did and did not experience sexual coercion (M=37.7, SD= 1.1 vs M= 42.1, SD =.5, respectively). There were no significant differences in HIV prevention self-efficacy when examining physical abuse. Additional efforts can be made to address IPV, an identified risk factor that reduce women’s abilities to effectively prevent HIV, among women who experience incarceration.

Category: 9.0 - Research in Special Population Sub-Groups - 9.06 - Incarcerated Populations - RESEARCH ABSTRACT

Grant Support: Funding provided by the National Institute of Minority Health and Health Disparities Grant #1P20MD006881-02

PARENTS TAKING ACTION TO IMPROVE AUTISM SERVICES ACCESS FOR NAVAJO FAMILIES IN NORTHERN ARIZONA: PRELIMINARY QUALITATIVE FINDINGS

Dr. Olivia J Lindly - Northern Arizona University
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Northern Arizona University

Abstract

PURPOSE: Autism spectrum disorder (autism) is a chronic, complex neurodevelopmental condition that affects many children (~1 in 54). Timely services access can help to optimize health for autistic children. Yet many autistic children of color, including those who are Indigenous, experience persistent inequities in timely services access. In Northern Arizona, ~29% of individuals identify as Indigenous. The largest federated tribe in Northern Arizona and the U.S. is the Diné (Navajo) tribe. Little is known about Diné parent/guardian experiences raising autistic children, and this knowledge is needed to inform parent education and training programs for this population. This study, therefore, sought to provide greater understanding of Diné parent/guardian lived experiences raising autistic children. METHODS: Our study team conducted outreach to community-based organizations such as Navajo Head Start within the Western, Central, Fort Defiance, Eastern, and Northern Navajo Agency Councils during 2021. To date, we have recruited and interviewed 12 Diné parents/guardians of autistic children. Interviews were audio recorded, and directed content analysis was performed on the transcriptions. RESULTS: The following themes emerged: (1) greater understanding of autism is needed among Diné families; (2) pediatrician screening and referral facilitates early autism diagnosis for Diné families; and (3) schools often provide the most autism services to Diné children, but parent/guardian autism education and training is limited. CONCLUSION: Diné parents/guardians of children with autism commonly struggle to access services, and these challenges have been magnified during the pandemic. Although healthcare and education organizations provide autism services, these services do not necessarily educate and train Diné parents and guardians. Greater Diné family and community education and training about autism is needed going forward.

Category: 9.0 - Research in Special Population Sub-Groups - 9.07 - Indigenous Populations - RESEARCH ABSTRACT

Grant Support: NIH/NIMHD RCMI U54MD012388 & 2020-2022 Organization for Autism Research Applied Research Competition Grant

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BARRIERS TO PREP UPTAKE AMONG MSM IN PUERTO RICO

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University of Puerto Rico, Medical Sciences Campus (SMMR, EISR, IOC, RVM); The George Washington University (CERD)

Abstract

PURPOSE Puerto Rico is one of the jurisdictions prioritized in the US-Ending the HIV Epidemic (EHE) initiative. Men who have sex with men (MSM) are at increased risk for HIV infection. Pre-exposure prophylaxis (PrEP) is an effective biomedical tool to prevent HIV infection when used as recommended. Puerto Rico has one of the lowest PrEP uptake rates among MSM in the US. This analysis aims to identify the principal barriers to PrEP uptake among MSM in Puerto Rico. METHODS A web-based cross-sectional survey assessed frequency of PrEP use, PrEP interruption, and barriers to PrEP uptake. Ongoing data collection began in January 2022. Descriptive statistics were computed using the Statistical Package for the Social Sciences (SPSS). RESULTS Preliminary results from 76 participants (mean age 25.3) indicate that most held at least a bachelor's degree (85.5%), were employed full-time (73.7%), and 43.4% resided in the San Juan metropolitan region. Over half (53.9%) had a primary sex partner. From 80.3% reporting condomless sex during the latest encounter, 27.6% were unaware of their partner's HIV status. One-third (31.6%) perceived being at high risk for HIV, and 17.1% were diagnosed with an STI after initiating PrEP. Two-thirds (67.1%) have used PrEP for at least one year. Since starting PrEP, 26.3% have interrupted the regimen at least once. Barriers to initiating PrEP included: medical insurance coverage (26.3%), unawareness (21.1%), and HIV stigma (15.8%). While on PrEP, barriers for uptake include worries about long-term side effects (32.9%), not having the medication accessible (27.6%), and medical insurance difficulties (27.6%). CONCLUSIONS Medical insurance coverage is a persistent challenge for PrEP uptake during initiation and treatment. Support for coverage to avoid delays in medication accessibility is needed. Identifying structural and individual-level barriers for PrEP uptake is critical to promoting optimal prevention among individuals at high risk for HIV.

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

Grant Support: This study was supported by the Center for Collaborative Research in Health Disparities (CCRHD) Grant U54 MD007600 (National Institute on Minority Health and Health Disparities) from the National Institutes of Health.

BEYOND NATIONAL POLLS: VACCINE HESITANCY, MEDIA & TRUST

Dr. Lisa Michelle Paulin - North Carolina Central University
T ZHANG, LM Paulin, IA Doherty, L Brown, D Kumar
North Carolina Central University

Abstract

PURPOSE: National and state polls have monitored COVID-19 vaccine hesitancy. Participation in national surveys – just as health disparities – is not equal. Underserved groups are underrepresented in polls. We report findings from in-person surveys in mainly Black and Latina rural communities in North Carolina. We hypothesized that (1) White, Black and Hispanic participants in excluded communities would have larger gaps in vaccine hesitancy than the national polls conducted at that time. (2) Different racial groups attribute vaccine hesitance to different reasons. (3) Different racial groups have different trusted information sources regarding COVID vaccines. (4) Vaccine hesitancy among underserved communities is associated with media use and certain emotions. METHOD: From August to

December 2021, we held 52 COVID-19 testing events in predominantly Latino and Black communities. Participants voluntarily completed 1292 surveys at the events. RESULTS: H1 was supported, people who would NOT take the vaccine was double the national poll. For H2, reasons for not taking the vaccine, Latinos were significantly less likely than Blacks or Whites to select “vaccine safety” and Black respondents were 30% more likely than Whites or Latinos to report “do not trust the government” as the reason. For H3, Blacks and Latinos trusted public health websites less than Whites while Blacks were significantly more likely to trust a religious leader than Whites. But health care providers were the most trusted sources for all. For H4, we found a relationship between people feeling a little less annoyed, trusting information from community test providers and friends and using google distinguished people who would take the vaccine from those who would not with news consumption being marginally significant. CONCLUSION: Our study shows the importance of being present for local information gathering to reveal the nuances of decision making, trust, and access to information regarding health care.

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

Grant Support: CARES Act

THE FEASIBILITY AND ACCEPTABILITY OF SIBLINGS SUPPORTING LATINX GAY MEN’S PREP USE

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Charles R. Drew University of Medicine and Science (HDP, PD, NTH); St. John’s Well Child and Family Center (ER); Northwestern University (JDD); David Geffen School of Medicine at UCLA (NTH, HDP)

Abstract

PURPOSE We explored the feasibility and acceptability of engaging the siblings of Latinx gay men (LGM) in the promotion of PrEP to prevent HIV infection. Family ties affect Latinx people’s physical and mental health and can be leveraged in health interventions, but this resource has been overlooked for LGM. This study focused on sibling relationships. We answer the question: How far would the siblings of LGM go to support PrEP? METHODS We used a mixed methods design and we used the Information-Motivation-Behavioral Skills and Stages of Change models to create instruments. We conducted surveys and dyadic interviews with LMSM-sibling pairs (n=31) and three focus groups only with the siblings of LMSM (n=20) in Los Angeles. RESULTS We found: (1) LGM can be motivated by their siblings to take PrEP: 22 (71%) LGM reported that they would take PrEP if it would make their sibling worry less about them and eight (26%) started using PrEP after the interviews. (2) Siblings are willing to provide instrumental support: 90% agreed to go to the doctor with their LGM brother, 87% agreed to remind him to take a pill every day. Nineteen (95%) siblings in the focus groups reported that they would take PrEP if it would help their brother get started. CONCLUSION Siblings can be engaged in PrEP promotion. We recommend: (1) Create dissonance in siblings; (2) Empower siblings talk about PrEP; (3) Clarify misconceptions; and (4) Create 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

Grant Support: NIH/NIMHD under Grants R25MD007610, S21MD000103, U54MD007598, and K01MD015002; NIH/NIA under Grants P30-AG021684; NIH/NIMH under Grants P30MH058107, R36MH106357, and T32MH019139; NIH/NIDA under Grant R01DA039934; NIH/NCRR/NCATS under Grant UL1TR001881

RETENTION AND RE-ENGAGEMENT IN HIV CARE IN LATINO IMMIGRANTS

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Florida International University (DRO, MA, SA, PC, MJT, DMS); University of Central Florida (MSC)

Abstract

PURPOSE: This ongoing multi-method study is examining multilevel barriers to retention and re-engagement in HIV care among Latino immigrants who are disengaged from care in Miami-Dade County, Florida. The findings will inform the adaptation of the CDC evidence-based intervention, Antiretroviral Treatment and Access to Services (ARTAS), to facilitate re-engagement into care for sub-groups at high risk for disengagement. METHODS: We are using in-depth interviews and key informants (e.g., case managers) to identify barriers. In addition, through a group-based trajectory modeling of Florida statewide HIV surveillance data, we are examining longitudinal trajectories of engagement in HIV care among Latino immigrants newly diagnosed during 2015-2016 and followed for 3 years to identify sub-groups at higher risk of disengaging from care who may benefit the most from the adapted re-engagement intervention. RESULTS: Some barriers to retention and re-engagement stated in the interviews conducted thus far (n=6) include undocumented immigration status, unstable employment, conflicting work schedule, housing instability, moving from place to place, difficulties meeting program paperwork requirements, mental health issues, substance use, and fear of acquiring COVID-19 in HIV clinics. Moreover, phase 1 of the quantitative analysis revealed three distinct trajectory groups of HIV care engagement in our cohort of Latino immigrants (n=1,607): consistently high (78.0%), steadily decreasing (5.7%), and consistently low retention (16.3%). In phase 2, we will identify sociodemographic and clinical predictors associated with sub-optimal care engagement trajectories. DISCUSSION/CONCLUSION: Given the sub-optimal rates of retention in HIV care among Latinos and the complex care access needs of those who are immigrants, forthcoming results from this study will provide necessary data to adapt and evaluate the ARTAS intervention to facilitate re-engagement and retention among Latino immigrants.

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

Grant Support: This research is being supported by the National Institute on Minority Health and Health Disparities (award: U54MD012393).

RECOMMENDATIONS FROM LATINX TRANS AND NON-BINARY INDIVIDUALS FOR AN INTERVENTION TO PROMOTE CANCER PREVENTION

Dr. Alixida Ramos-Pibernus - Ponce Health Sciences University
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Ponce Health Sciences University; Florida International University

Abstract

Latinx trans and non-binary individuals (individuals whose gender identity does not align with their sex assigned at birth; LTNB) face increased cancer-related health disparities. Studies evidence how barriers at the individual (e.g. low CC screening literacy), provider (e.g. “misgendering” or use of incorrect pronouns) and organizational levels (e.g. exclusion of transgender option in required documentations) are driving cancer disparities among LTNB individuals, particularly in Puerto Rico and Florida. These barriers increase emotional discomfort associated with testing and disengagement from cancer prevention efforts. Moreover, there are no guidelines or interventions that address cancer prevention specifically among LTNB individuals. There is a need to develop interventions informed by the LTNB communities to promote cancer prevention and screening. The purpose of this presentation is to describe the recommendations provided LTNB individuals to foster cancer screening and prevention among the community. We conducted two online focus groups with LTNB participants (N=15). Participants were recruited using non-probabilistic purposive sampling. We used rapid-qualitative analysis for data interpretation. Findings are gathered in three main themes: (1) recommendations for the content of an intervention promoting cancer prevention; (2) specific recommendations to promote cancer screening among LTBN individuals; and (3) recommendations on the format of the potential intervention. These results evidence the need and feasibility for developing community informed tailored interventions targeting cancer screening and prevention care to reduce cancer-related health disparities among LTNB population.

Category: 9.0 - Research in Special Population Sub-Groups - 1.01 - Cancer Health Disparities - RESEARCH ABSTRACT

Grant Support: Dr. Ramos-Pibernus is supported by the National Cancer Institute under award 5R21CA233449-02; Dr. Rivera-Segarra is supported by the National Institute on Minority Health and Health Disparities under award U54MD007579 and the National Institute of Mental Health under award R34MH120179.

COVID-19 AND PREVIOUS NATURAL DISASTERS EXPERIENCE'S IMPACT ON THE MENTAL HEALTH OF HEALTHCARE WORKERS IN PUERTO RICO

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UNIVERSITY OF ROCHESTER (RHT); UNIVERSITY OF PUERTO RICO, MEDICAL SCIENCES CAMPUS, PUERTO RICO (MM-L); NEOMED CENTER INC., PUERTO RICO (IT); PONCE HEALTH SCIENCES UNIVERSITY (ER-H; AR-P; AS; LO; ER-S); MAILMAN SCHOOL OF PUBLIC HEALTH, COLUMBIA UNIVERSITY (FM)

Abstract

This study aimed to assess the impact of COVID-19 pandemic worries (e.g., fear of contagion) and previous exposure to natural disasters (e.g., hurricanes) on Healthcare Workers (HCWs) mental health in Puerto Rico. This research is part of a larger international research project (the COVID-19 HEalth caRe wOrkErS [HEROES] study) aiming to describe and track mental health symptoms and disorders among health care workers at different phases of the pandemic in 26 countries across the world. Results correspond to the baseline data from Puerto Rico. Participants completed a self-administered online survey from June 2020 to October 2020. Survey included items on sociodemographic information (i.e., worries about the COVID-19 pandemic and past natural disasters) and depressive symptoms and resilience. Logistic regressions models were performed to explain the relationship between depressive symptomatology and COVID-19 experiences and worries. A total of 263 participants completed the survey. 40.9% of the sample was classified as having low to severe depressive symptomatology (PHQ-8 ≥5). Results reflected normal to high levels of psychological resilience (BRS; M=3.6, SD=0.7). Most participants responded that having experienced Hurricane María and the 2020 earthquakes made it "somewhat" (47.0%, n=94) to "much more" (15%, n=30) challenging to cope with emotions during the COVID-19 pandemic. A significant association was found between depressive symptomatology and psychological resilience (OR=0.44, 95% CI: 0.25-0.77). The odds of having depressive symptomatology were almost five times higher (OR=4.79, 95% CI: 1.71-13.44) among those reporting emotional coping difficulties during the pandemic after a natural disaster, compared to those who did not. Despite high psychological resilience levels, those who reported emotional coping difficulties due to previous disasters had almost five times the odds of developing depressive symptomatology.

Category: 9.0 - Research in Special Population Sub-Groups - 9.03 - Global Health - RESEARCH ABSTRACT

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NATIVE AMERICAN COVID-19 PERCEPTIONS AND TESTING HESITATION

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Abstract

PURPOSE: American Indians (AI) are at higher risk of contracting COVID-19 and being hospitalized than the general population. The Building Resiliency and Vital Equity (BRAVE) project aims to address the urgency of reaching and intervening in American Indian communities in North Carolina by providing educational materials and outreach intervention to improve testing and vaccination rates in rural American Indian communities. METHODS: Culturally-sensitive interview surveys were designed to assess the barriers and social implications of COVID-19 testing and vaccination among AI. A randomly selected group of Native Americans were interviewed. RESULTS: Results suggest that though a majority of interviewees knew about COVID-19, 8% were unaware. Only 58% received COVID-19 testing and 50% perceived COVID-19 testing as very important. Others' bad perceptions, political reasons, doubts about test result accuracy, reluctance to share results, limited access to testing, and complaints about testing cost influenced testing hesitancy. 27% needed social support; 27% needed more specific information from doctors; and 23% needed mental health support. Leading sources for COVID-19 information were media outlets (i.e., TV/online news) (85%), CDC, people they know, health providers, and social media/network service. 42% trusted COVID-19 information depending on the source; 35% expressed confusion about the information received. 23% were frustrated with misinformation. To efficiently communicate COVID-19 information among Native Americans providing information through tribal office (35%), disseminating by health departments (35%), and using community churches (31%) were suggested. 92% perceived the masking requirement good and will wear masks, 35% did not like to wear masks and 23% felt minor inconvenience. CONCLUSION: Findings suggest significant intervention and education efforts are essential in improving AI's perceptions of COVID-19 testing and minimizing testing hesitation.

Category: 9.0 - Research in Special Population Sub-Groups - 9.07 - Indigenous Populations - RESEARCH ABSTRACT

Grant Support: Funding is supported by the North Carolina Policy Collaboratory at the University of North Carolina at Chapel Hill with funding from the North Carolina Coronavirus Relief Fund established and appropriated by the North Carolina General Assembly, grant U54MD012392 from the National Institutes of Health, and R01-MD012767-04S1 from NIH Office of Minority Health and Health Disparities.

HUMAN MYOMETRIAL AND UTERINE FIBROID STEM CELL-DERIVED ORGANOIDS FOR INTERVENING THE PATHOPHYSIOLOGY OF UTERINE FIBROID

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Abstract

Uterine fibroids (UFs) (leiomyomas or myomas) are the most common clonal neoplasms of the uterus in women of reproductive age worldwide. UFs originate from myometrium consist of smooth muscle and fibroblast components, in addition to a substantial amount of fibrous extracellular matrix which all contribute to the pathogenetic process. Current treatments are primarily limited to surgical and interventional. Here we have established a novel and promising organoid model from both normal and patient myometrial stem cells (MMSCs). MMSCs embedded in Matrigel in stem cell media swiftly formed organoids which successfully proliferate and self-organized into complex structures developing a sustainable organoid culture which maintain their capacity to differentiate into the different cell types recapitulating their tissue of origin and shows responsiveness to the reproductive hormones (estrogen and progesterone). Gene expression analysis and structural features indicated the early onset of uterine fibrosis led to the accumulation of extracellular matrix suggesting the potential use of this model in better understanding of the pathophysiology associated with UFs and inventing novel therapeutics for the treatment of UFs.

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

Grant Support: National Institutes of Health Grants U54MD007602-34,

ENCOURAGING AND REINFORCING SAFE BREASTFEEDING PRACTICES DURING THE COVID-19 PANDEMIC

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Abstract

Background: Breastfeeding goals can be compromised by lack of support during the COVID-19 pandemic. Aim: To promote safe breastfeeding during the pandemic. Methods: Individualized counseling for participants was by a trained educator based on CDC COVID-19.breastfeeding guidelines. Data was obtained from 39 mothers attending Nashville General Hospital pediatric well-baby clinics (Group I: Dec. 2019 to May 2020), and 97 pregnant women attending prenatal clinics (Group II: June 2020 to date). Results: Participant ages ranged from 15 – 45 years, mean of 27.5±6.2. Women in both groups were similar by age, education, employment, and breastfeeding experience. They were equally unlikely to use facemask at home even while receiving guests or holding their baby. Although 113(83.1%) claimed facemask use while shopping, rate for never doing so was respectively 6(15.4), to 2(2.1), $p<0.006$, for Group I and II. Half limited outing (48.5%), hand sanitized (45.6%), restricted visitors (32.4%), limited baby outing (19.9%), and 8(8.2%) who received COVID-19 vaccination were in Group II. About half described fair-accurate COVID-19 safe breastfeeding knowledge, but 30(27.9%) claimed they received no information. Breastfeeding contraindication awareness for Group I and II were respectively: Cocaine: 53.8% vs 37.1%, $p<0.06$; HIV: 35.9% vs 12.4%, $p<0.002$; breast cancer: 17.9% vs 16.5%; COVID-19 with symptoms: 28.2% vs 5.2%, $p<0.001$. Information source was similar with family/friend/media accounting for 56.6%, while doctors/nurses/CLC was 15.4%. Exclusive breastfeeding one month postpartum for Groups I & II was 41.9% to 12.8%, $p<0.006$, respectively. Conclusion: Mothers were not more knowledgeable regarding safe COVID-19 breastfeeding one year into the pandemic. Conflicting lay information can create ambivalence that can be prevented by health professionals confidently advising mothers to wear facemask when breastfeeding, restrict visitors and outings, and accept COVID-19 vaccination.

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

Grant Support: 3U54MD007586-34S4 Adunyah (PI), Hildreth (PI) NIMHHD. RCMI Program in Health Disparities Research. Administrative Supplement

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AN ONGOING STUDY OF THE CELL-SPECIFICITY OF BREAST CANCER DRIVEN BY MUTANT P53

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Abstract

PURPOSE Breast cancer is one of the most commonly diagnosed cancers and the second leading cause of cancer death among women. In females, the epithelium forms into a branching structure consisting of an outer basal myoepithelial layer of cells and an inner luminal cell layer. These basal and luminal cells differentially express cytokeratins; cytokeratin 5 mark basal cells, whereas cytokeratin 8 mark luminal cells. It remains unclear whether and how these different cellular origins contribute to cancer development differentially. METHODS Genetic alterations in breast cancer most frequently occur in p53, with the majority of p53 mutations occurring somatically at arginine 248 (R248; R245 in mice). We propose to model mutant p53 driven-breast cancer using the previously generated conditional mouse p53wm-R245W allele that allows WT to mutant p53 conversion in response to Cre. EXPECTED RESULTS Mutant p53 will be induced in the myoepithelial or luminal cells in the mammary epithelium, by delivering the adenovirus expressing Cre controlled by K5 or K8 promoter into the mammary ducts of p53wm-R245W/+ mice, respectively. Previously mammary tumors have been successfully induced from the p53wm-

R245W/+ mice following intraductal injection of Ad-Cre. We expect to have similar tumorigenic effects. we expect that p53wmR245W/+ female mice subjected to intraductal injection of either AdK5-Cre or AdK8-Cre will both develop mammary tumors. DISCUSSION Upon successful induction of p53R245W driven mammary tumors initiated from the myoepithelial or luminal cells, we plan to investigate the cell-specificity of mammary tumors at the transcriptomic and genomic levels using RNA sequencing and whole-exome sequencing. We believe that this study will further improve our understanding of breast cancer, which may ultimately allow the tailoring of therapeutic strategies to the fundamental molecular lesions driving a particular tumor.

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

Grant Support: Texas Southern University RCMI Program