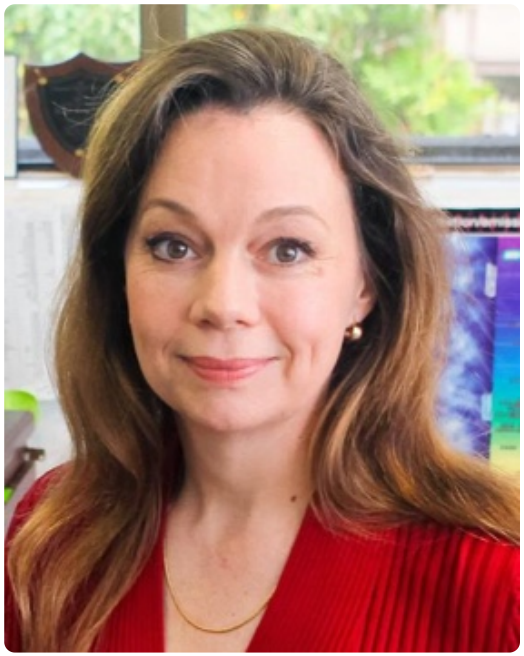


RTRN Small Grants Program, 2016–2017
“Clinical Trial of Box Jellyfish Sting Treatment”

Angel A. Yanagihara, PhD

Associate Professor

University of Hawai’i at Manoa

RESEARCH AREAS

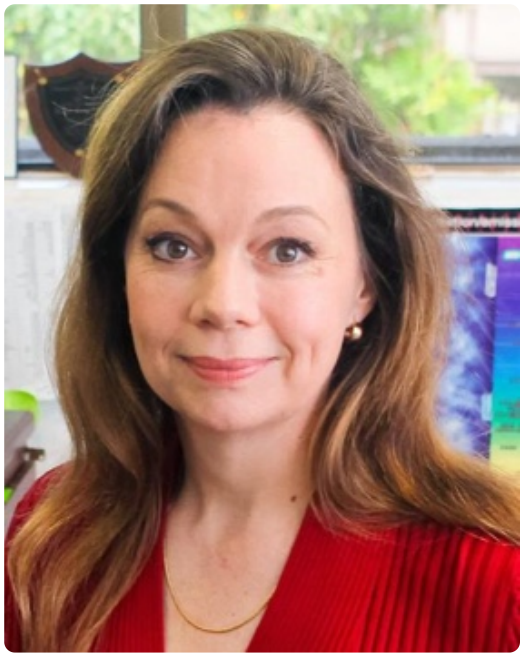
- Oceans and human health
- Systematic biochemical characterization of novel toxins
- Pharmacology for the discovery of bioactive compounds from venomous marine invertebrates

SCIENTIFIC ACHIEVEMENTS

- Translation of groundbreaking basic science discoveries into the development of highly effective first-aid products for potentially lethal jellyfish stings.
- Discovered a box jellyfish venom containing a pore forming protein far more potent than the anthrax anthrolysin O toxin.
- Demonstrated that metal gluconates of zinc and copper are powerful porin-specific inhibitors using in vivo murine and porcine models.
- Developed FDA- and FTC-compliant over-the-counter topical formulations (StingNoMore®) containing copper gluconate for first-aid management of jellyfish envenomation. Patent 10,172,883

FUNDING

RCMI Funding:



Angel A. Yanagihara, PhD

Associate Professor

University of Hawai'i at Manoa

SCIENTIFIC ADVANCE

Elucidation of Medusozoan (Jellyfish) Venom Constituent Activities Using Constellation Pharmacology

Published in Toxins, Volume 16, 2024 PMCID: PMC11510950.

Researchers have made a groundbreaking discovery that could revolutionize pain medicine by uncovering a treasure trove of bioactive compounds in jellyfish venom. This reveals that jellyfish contain numerous small proteins and peptides that can precisely control nerve cell activity. Using an advanced laboratory technique called "constellation pharmacology," the research team tested purified jellyfish venom components on mouse nerve cells that process pain signals, monitoring their responses through sophisticated calcium imaging technology. The results showed that these venom compounds produced three distinct, dose-dependent effects on different types of nerve cells, and importantly, these effects were completely reversible. The compounds appear to work by targeting specific molecular gates on nerve cells that control electrical signaling, suggesting they could be developed into a new class of painkillers. This discovery not only opens up jellyfish as an entirely new source for pharmaceutical development but also demonstrates the untapped potential of marine organisms in creating safer, more effective medications for treating pain and neurological conditions.

NIH/NIMHD #U54MD008419, #G12RR00306