Introduction to Natural Products

The environment is an adept producer of pharmaceuticals. Natural products are complex compounds designed to interact effectively with their targets.¹

**Salinosporamide -A** is a potential anticancer agent from the bacteria *Salinispora tropica* and *Salinispora arenicola*.

The purpose of this research is to find and extract biologically active molecules from microbiomes of marine organisms.

**O. praegustator** is a parasitic isopod found in the mouths and gills of menhaden fish in the Cape Fear River. It can be identified by hemorrhaging and damage in the faces and gills of menhaden.

Parasite Microbiomes

Bacteria, parasitic hosts, and superhosts share tripartite interactions.

These interactions can lead to the production of natural products.

- **Antibiotic, antifungal, antiviral production** Protect both the parasite and menhaden fish
- **Cytotoxic and anticoagulant properties** Prevent the menhaden’s wound from sealing

Compounds from these bacteria could be utilized to treat pathogenic diseases or cancer.

**Bacteria Chemical Extract Library in the DISCOvery group**

**Harvesting**

Environmental samples of the bacteria and purified cultures were grown by graduate students in the group and then scaled-up to liquid cultures:

- Environmental culture, isolates DSA 031 and DSA 025

Organic compounds were removed from the liquid cultures with XAD-16 resin and the extracts and resins were filtered onto filter paper. The cells and resins were then extracted with 80% methanol and dried.

**Purification**

Salt and polar media components are removed from the extract using an Oasis® PRIME HLB column.

Nonpolar substances can give false positives in bioassays and their removal from the extract is vital.

**Bioassay Testing**

Extracts resuspended and delivered to collaborators for bioassay screening.

- **Throat, thyroid, and neck cancer drug lead screening** at Wayne State University Medical School
- **Drug resistant pathogen antibiotic screening** at George Mason University

The testing of crude extracts against the increase of esophageal cancer cells.

**Antibiotic Testing**

These pathogens are a group of multidrug resistant bacteria that are responsible for many serious infections.

**References**


**Acknowledgments**

UNCW Drug DISCOvery team