

# Medicines from the sea (healing waters)

*Alzheimer's, AIDS, malaria ... Through new technologies, Scripps researchers are discovering potential treatments and cures from an unlikely source – our oceans.*



## Select giving opportunities

**Endowed Chair in Marine Biotechnology and Biomedicine**  
\$3.5 million

**Endowed Directorship Fund**  
\$500,000

**Endowed Career Development Award for Young Scientists**  
\$500,000

**Named Endowed Student Fellowship**  
\$250,000

**Career Development Award for Young Scientists**  
\$100,000  
*(\$20,000/year for five years)*

## Center for Marine Biotechnology and Biomedicine at Scripps

A “simple” infection refuses to heal. A “common” sore throat requires a second round of treatment. How is it that medical science has been losing ground since Alexander Fleming’s 1928 discovery of the antibiotic properties of *Penicillium notatum*? It is happening because bacteria, viruses, parasites, cancers and even our own immune systems are adapting to and outsmarting our treatments. We must attack these microscopic enemies on several fronts – physical, chemical and genetic – which is why the search for new pharmaceuticals has gone to sea.

The oceans cover about 70 percent of the planet and are home to the broadest ecological diversity on Earth. Since the 1960s,

Scripps Institution of Oceanography researchers have combed the oceans for prolific – yet elusive – compounds that can be used to sustain human health. From the coast to its depth, these waters are rich with mysterious microbes that are being studied and cultivated to provide medical treatments for disease, with an urgent focus on development of new antibiotics to combat drug-resistant infections.

Decades of painstaking data collection and analyses are producing results, and our pharmaceutical partners have begun clinical trials of drugs derived from marine bacteria. Much more testing and development is needed, but the seas are offering up microbes that are leading to new

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## Collaboration: a straighter line to success

Extracting medicines from the sea is a relatively new field of study, but it has infinite potential, according to Scripps researchers Bill Fenical and Bill Gerwick.

Fenical is one of the founders of the marine natural products field and is currently the director of the Center for Marine Biotechnology and Biomedicine. He is also on the UC San Diego Moores Cancer Center faculty, as much of his work involves collaborating with cancer physicians. Fenical's research focuses on the discovery and development of marine natural products as potential treatments mainly for cancer and infectious diseases.

Gerwick is a professor at Scripps' Center for Marine Biotechnology and Biomedicine and the Skaggs School of Pharmacy and Pharmaceutical Sciences. His research focuses on exploring marine algae and cyanobacteria, chemically prolific organisms that are sources of highly unusual metabolites. Gerwick's lab has been involved in the discovery and evaluation of the organisms in the areas of cancer, inflammation, infectious diseases such as malaria, and neurochemical pathways, as well as in agricultural uses.



antibiotics, anti-virals and other cures. And, given sufficient resources, Scripps researchers will find more of them.

As an important player in one of the top biotechnology regions in the world and as part of a top-ranked research university, Scripps stands apart from other oceanography institutions for its promise for the fields of biomedicines and biotechnologies.

## Scripps leadership

Marine biomedicine is being supported by visionaries who believe that if life began in our oceans, those oceans hold the key to sustaining life. This is why Scripps Oceanography established the Center for Marine Biotechnology and Biomedicine in 1998.

The purpose of this center is to create new biotechnologies from marine biochemistry by creating strong ties across different scientific disciplines. The center bridges a number of stellar groups across the university, linking oceanographers with the UC San Diego School of Medicine, the Skaggs School of Pharmacy and Pharmaceutical Sciences, the Division of Biological Sciences, the Center for Molecular Genetics and the Jacobs School of Engineering. Experts work together to identify efficiencies to support their research while avoiding redundancy.

## Treatment studies

Treatment for a tumor, infection or allergy begins with understanding our bodies' mechanisms at the cellular, molecular and genetic levels. Researchers at Scripps' Center for Marine Biotechnology and Biomedicine are conducting the following studies:

- studying the functional mechanisms by which human DNA mutations lead to disease



- deconstructing the role of fibrinogen in blood clotting
- probing deeper into cardiovascular and respiratory physiology

As they learn more about the human body, researchers are trying to find solutions from marine science through the following projects:

- sequencing marine genomes
- understanding the diverse ways in which bacteria sense and respond to their environment
- observing how plants and animals create their apparent immunities

## Can you help stem the tide?

For more information, contact Stuart Krantz 858-822-1405 or [skrantz@ucsd.edu](mailto:skrantz@ucsd.edu).  
[supportscripps.ucsd.edu](http://supportscripps.ucsd.edu)