

# Mining Marine Microbes for New Drugs

THE SEA HOLDS POTENTIAL TO COMBAT RESISTANCE TO ANTIBIOTICS *by Lonny Lippsett*



## The Problem

A staggering 20 percent of all human deaths around the world are caused by bacterial infections. Hospital-acquired infections are the sixth leading cause of death in the United States.

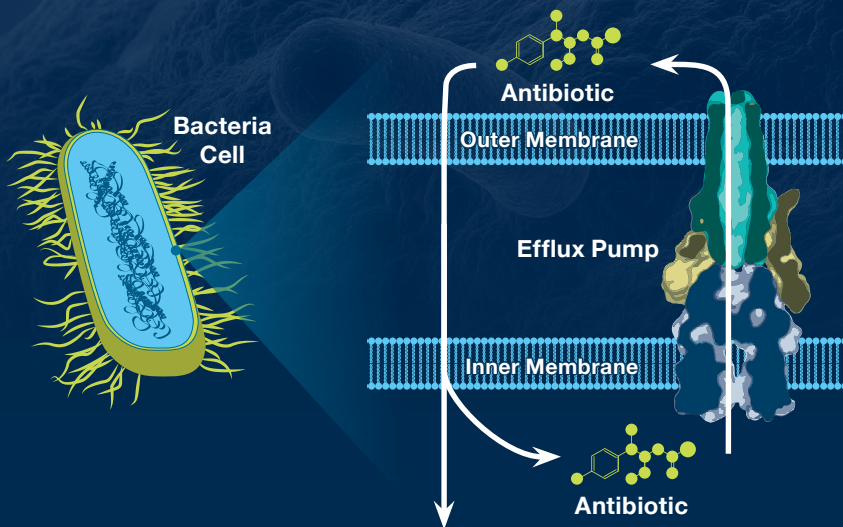
Current antibiotics are becoming less effective as bacteria increasingly become resistant to them. The pipeline to develop new antibiotics to combat drug-resistant "superbugs" has been drying up.



## The Potential





Many of our most potent antibiotics are derived from chemical compounds produced by bacteria to defend themselves against competing microbes. To date, most antibiotics have been isolated from bacteria in soil. But the ocean remains a vastly unexplored frontier of unknown microbes, say WHOI scientists Tracy Mincer and Kristen Whalen.

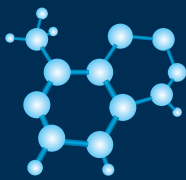
The ocean is a war zone where microbes are constantly making compounds to protect themselves against competitors. By understanding the chemical warfare and ecology of the marine microbial world, the scientists say they can be more strategic about discovering novel compounds that could be effective drugs to combat human pathogens.



## The Strategy

Inhibit efflux pumps' ability to flush out antibiotics by finding novel compounds that can:

-  Knock out the cellular machinery that builds efflux pumps
-  Shut down the cellular energy source needed to expel antibiotics
-  Plug the pump channel that transports antibiotics
-  Block sites where pumps "grab" antibiotics to export them



## The Progress

Whalen and Mincer have extracted bioactive compounds from more than 450 strains of marine microbes. Twenty of these have shown signs that they can inhibit efflux pumps, which could help restore the effectiveness of current antibiotics.

