Doherty professor studies marine organisms

http://www.firstlight.cn 2007-03-12

[作者] massachusetts institute of technology
[单位] massachusetts institute of technology
[摘要] March 7, 2007. In work that will improve our understanding of the marine microorganisms that are essential to healthy oceans, an MIT professor is using microfluidics to study these organisms in the lab under conditions close to what they experience in the wild.
[关键词] marine microorganisms;Civil and Environmental Engineering

March 7, 2007.

In work that will improve our understanding of the marine microorganisms that are essential to healthy oceans, an MIT professor is using microfluidics to study these organisms in the lab under conditions close to what they experience in the wild.

For his work, Roman Stocker, assistant professor in the Department of Civil and Environmental Engineering, has been awarded the 2007 Doherty Professorship in Ocean Utilization from the MIT Sea Grant College Program. Every year, the program selects one or two new faculty members for a supplemental award of $25,000 per year for two years.

Endowed by the Henry L. and Grace Doherty Charitable Foundation, the Doherty Fellowship encourages promising, non-

tenured professors to undertake marine-

related research that will further innovative uses of the ocean's resources. The area of research may address any aspect of marine use and/or management, whether social, political, environmental or technological.

Stocker's research will focus on the marine microorganisms that are at the base of the oceans' food web and are essential to the oceans' healthy functioning. "We're interested in how swimming microorganisms actively respond to their environment," says Stocker, "as that strongly influences how nutrients are recycled in the ocean and ultimately made a

To date, quantifying these microscale interactions has been extremely difficult because they occur on too small a scale to be studied in the field, and recreating their environmental conditions in the lab has previously not been possible. To effectively study fluid mechanics at these small scales, Stocker uses custom

-

tailored microchannel devices. Tiny channels, with typical sizes of hundreds of microns, are sandwiched between a polymer on the top and a glass microscope slide fused to the bottom. Syringes and pumps generate flows of varying speeds in the channels, and nutrient and flow scenarios mimicking those in the ocean can be created.

"My work in microfluidics gives the biologists the ability to look at microorganisms in their environment in a manner that's impossible in the ocean, where the organisms are too small and the conditions too changeable. In the lab we can very carefully recreate typical conditions of a microbe's environment, and we can accurately track where the creatures

In his Doherty-

funded research, Stocker will look at whether bacteria can find patches of high nutrient concentrations and get to them before they dissipate by diffusion or flow. "If bacteria can rapidly find and consume nutrients, they will be recycling them and ultimately they will be returned to the food web. These processes can totally change our estimate of the car