

Media Relations

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UNH, UC Davis Launch Network to Study Environmental Microbes

DURHAM, N.H. – A grant to the University of New Hampshire and the University of California, Davis, will help biologists identify an abundant yet largely unknown category of organisms, leading to better understanding of the vital environmental functions they play.

The [National Science Foundation](#) awarded the two universities \$500,000 to develop a Research Coordination Network on eukaryotic biodiversity. The work will apply new genome sequencing technology to study and classify microscopic eukaryote species like nematodes, fungi, and single-celled animals.

These small yet complex organisms are invisible to the eye but abundant in marine and terrestrial environments – from sandy beaches to garden plots. “If you’re making a sandcastle, there are thousands and thousands of these creatures in a handful of sand. They provide key ecosystem services,” says co-principal investigator [W. Kelley Thomas](#), Hubbard Professor in Genomics and director of UNH’s [Hubbard Center for Genome Studies](#). They process waste, cycle nutrients, and even “eat” spilled oil, he says.

“I call them the ‘dark matter’ of biology,” says [Holly Bik](#), a postdoctoral researcher at [UC Davis](#) and co-principal investigator on the project. “They are in every single environment, but no one looks at them.” Bik worked with Thomas as a postdoctoral researcher at UNH.

The traditional taxonomic approach to biodiversity involves looking at an organism and describing the features – legs, wings, teeth, leaves – that make it similar to or distinct from other organisms. Because taxonomy is far easier and more efficient to apply to cats and cows and pine trees than to microscopic organisms like nematodes, knowledge of the Earth’s biodiversity shows a distinct bias toward larger species.

Now, [new high-throughput DNA sequencing](#) technology makes it possible to identify and classify these organisms much more quickly and comprehensively, describing each species with a short “barcode” of several hundred nucleotides.

The goal of this new network is to bring together researchers from different fields: taxonomists expert in identifying organisms; ecologists who study these ecosystems; genome scientists and computational biologists who can figure out how to analyze sequence data from these relatively complex animals.

The team aims to organize an annual "catalysis" meeting to bring researchers together, and they will also sponsor symposia at other scientific meetings. The program will bring scientists from around the world to UNH to collaborate toward better understand global patterns of biodiversity and ecosystem function. In addition, it will support an expanded relationship with two biodiversity experts (Eyuaem Abebe at Elizabeth City State University and Jyotsna Sharma-Srinivasan at The University of Texas, San Antonio). These partners serve significant populations of undergraduates from underrepresented groups and expand the potential diversity of scientists that will ultimately address long standing questions in biodiversity.

The network will also develop undergraduate training programs on taxonomy and genomics, based at UNH. Activities like “bioinformatics bootcamps” will enhance students’ research skills through interdisciplinary training.

“If we want the field to move forward we need to train the next generation of scientists,” Bik says.

The [University of New Hampshire](#), founded in 1866, is a world-class public research university with the feel of a New England liberal arts college. A land, sea, and space-grant university, UNH is the state's flagship public institution, enrolling 12,300 undergraduate and 2,200 graduate students.

Photographs available to download: <http://unh.edu/news/releases/2012/sept/kelleythomas.jpg>

Caption: W. Kelley Thomas, Hubbard Professor in Genomics and director of UNH's Hubbard Center for Genome Studies.

Credit: Mike Ross, UNH Photographic Services

<http://www.unh.edu/news/releases/2013/11/images/eukaryote-8347.jpg>

Caption: A marine nematode.

Credit: James Baldwin and Manuel Mundo, UCR

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