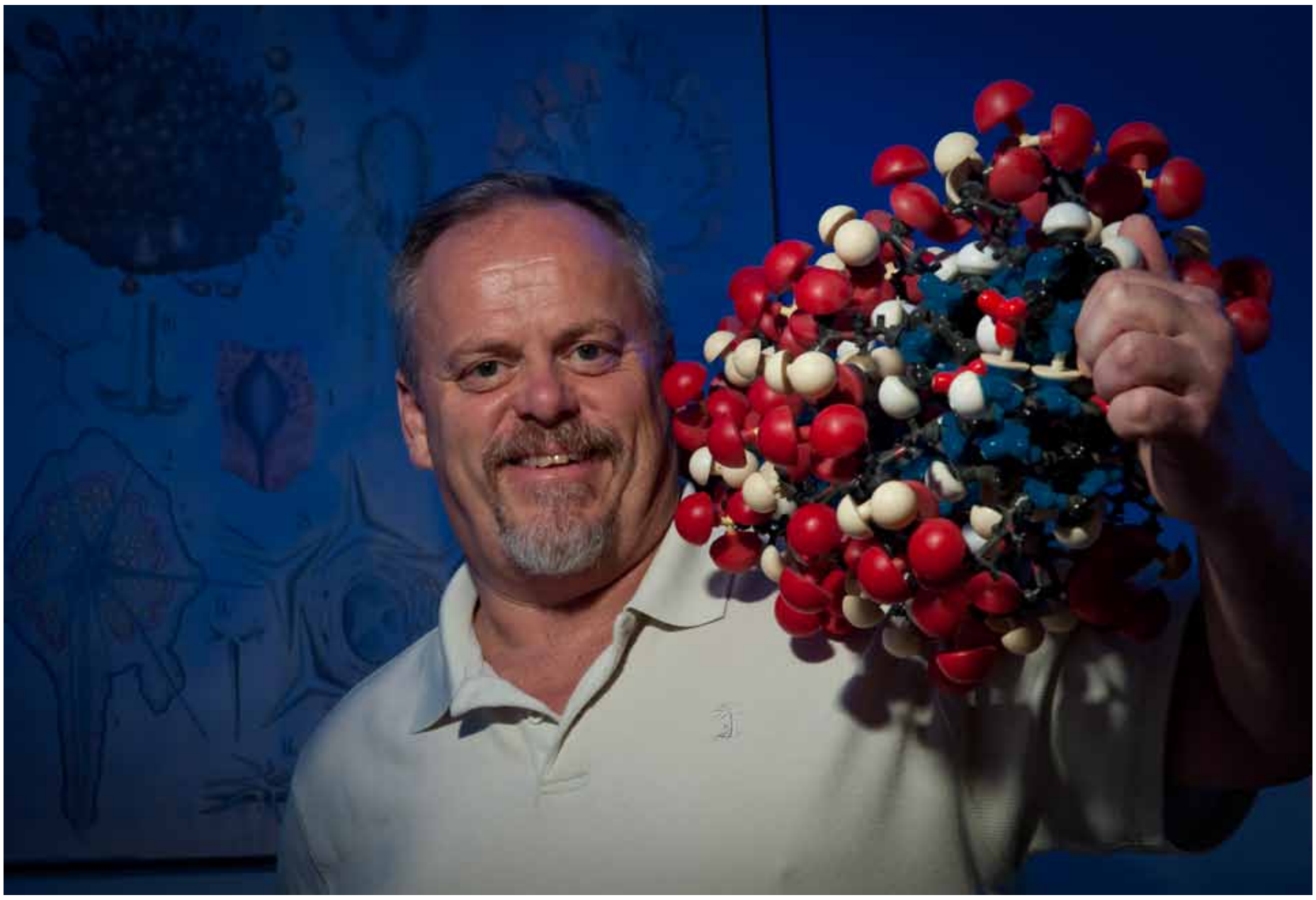
2011 FACULTY EXCELLENCE AWARDS



MIKE ROSS PHOTO

Excellence in Research Award

W. Kelley Thomas

Professor of Molecular, Cellular, and Biomedical Sciences

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Why do some members of a species develop cancerous cells while other members of the same species don't? Why do some aquatic organisms languish when their environments grow toxic with pollution while others not only survive but also seem to thrive on it? What might the adaptive qualities of microscopic organisms found in nature teach us about human health concerns?

To answer some of these big picture questions, Kelley Thomas and his colleagues at UNH, and worldwide, study the genetic makeup and evolution of one of nature's humbler creatures, nematodes (roundworms).

"Tiny, microscopic, wiggly things," Thomas calls them, adding that they comprise three-quarters of animal life on Earth.

Thomas' work with nematodes has put UNH on the leading edge of the emerging field of global environmental genomics. "Environmental genomics focuses on understanding how organisms adapt to environmental change at the molecular level," explains Thomas. "Which genes 'code' for successful and unsuccessful adaptation?"

To get at this kind of data, Thomas has worked collaboratively not only with other geneticists, but also with colleagues in zoology, natural resources, animal nutrition, and computer science to name only a few disciplines. Thomas has authored, or co-authored, dozens of publications that have garnered a whopping 6,000 citations en route to redefining his field. In February of 2011, for example, the journal *Science* published a study, which Thomas co-authored, describing the entire genome of *Daphnia pulex*, a crustacean better known as the common water flea. "For the first time, we understand how *Daphnia* interacts with the environment, not simply what the change looks like," says Thomas. "*Daphnia* is present in ponds and lakes worldwide, and arguably has the best understood ecology of any animal, so now with knowledge of the genome we can extend that ecological knowledge to the gene level."

Understanding how this crafty crustacean survives is also important to human health concerns, as evinced by the National Institutes of Health official designation of *Daphnia* as a "model organism" for understanding how people react to environmental change. Says Thomas: "I'm more hopeful than ever for the contributions of my field to the quality of human life. That's very satisfying in itself."

—Dave Moore