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Pioneering research on bacteria earns Orth state's top honor for science

DALLAS – Jan. 6, 2011 – Dr. Kim Orth, associate professor of molecular biology and biochemistry at UT Southwestern Medical Center, was recognized today as one of the state's top rising stars in research by The Academy of Medicine, Engineering and Science of Texas (TAMEST).

Dr. Orth was named a recipient of one of four 2011 Edith and Peter O'Donnell Awards by the academy at its annual conference in Austin.

Each year, the O'Donnell Awards honor outstanding achievements by early-career investigators in science, medicine, engineering and technology innovation. Each award consists of a \$25,000 honorarium, a citation and an inscribed statue. Dr. Orth received the award for science.

Dr. Orth has discovered new mechanisms by which invading bacteria hijack and deregulate a cell's signaling systems, cutting off the cell's ability to communicate with immune-system cells that are needed to fight off disease. Her studies of these mechanisms have important implications in medicine, especially in understanding and potentially treating infectious diseases and immune-related diseases.

Other O'Donnell Award recipients this year are Dr. Margaret Goodell, professor and Vivian L. Smith Chair of Regenerative Medicine at Baylor College of Medicine in Houston, for medicine; Dr. Jung-Chih Chiao, professor of electrical engineering at UT Arlington and adjunct associate professor of internal medicine at UT Southwestern, for engineering; and Duncan Hudson III and David Fuller III of National Instruments in Austin, for technology innovation.

"Kim Orth has made pioneering discoveries about the fundamental biochemical mechanisms underlying many bacterial infections," said Dr. Daniel K. Podolsky, president of UT Southwestern. "She has taken a multidisciplinary approach to these important questions, enabled by close collaboration with colleagues in multiple departments. It is this type of collaborative and interactive spirit that infuses UT Southwestern's research community and leads to scientific breakthroughs."

The awards, first given in 2006, were named to honor two of the Lone Star State's most generous and far-sighted supporters of medical, engineering, and scientific research and education. Previous UT Southwestern recipients of the award are Dr. Michael Rosen, professor of biochemistry and pharmacology, who received the inaugural award for science in 2006; Dr. Zhijian "James" Chen, professor of molecular biology, the 2007 recipient for science; Dr. David Mangelsdorf, chairman of

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pharmacology, the 2007 recipient for medicine; Dr. Beth Levine, chief of infectious diseases, the 2008 winner for medicine; and Dr. Rama Ranganathan, professor of pharmacology, the 2009 winner for science.

Dr. Orth's studies also have uncovered previously unknown mechanisms human cells use to carry out normal functions. For example, she discovered that an infectious ocean-dwelling bacterium found in oysters and other shellfish kills its host's cells by causing them to burst, providing the invader with a nutrient-rich meal that can then be used to fuel proliferation. The invading pathogen overtakes the host's autophagy, or "self-eating," machinery, a process that is usually tightly controlled.

Understanding how this bacterium commandeers that process led to the discovery of an entirely new way that ATP – a molecule that helps provide energy to our cells – can alter other molecules. The modification process, which the bacterium exploits in its cell-smashing rampage, is so novel that Dr. Orth's research team created a new name for it: AMPylation.

"Hopefully others will take what we learn in our laboratory about these basic biological processes and develop new strategies and treatments to combat disease," Dr. Orth said.

Dr. Orth studied psychology at Texas A&M University, but discovered a love for laboratory science after completing a molecular genetics course proctored by Dr. James Wild. She graduated with a degree in biochemistry and then earned a master's degree from the University of California, Los Angeles.

Dr. Orth received her doctorate in biochemistry and molecular biology from UT Southwestern. She joined the UT Southwestern faculty in 2001 as a W.W. Caruth Jr. Scholar in Biomedical Research. In 2003 she was named a Beckman Young Investigator by the Arnold and Mabel Beckman Foundation, and in 2006 she was named a Burroughs Wellcome Investigator in Pathogenesis of Infectious Disease. In 2010 she received the Norman Hackerman Award in Chemical Research from The Welch Foundation.

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