UT SOUTHWESTERN MEDICAL CENTER NEWS

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Welch Foundation honors UT Southwestern's Orth as 'rising star' in chemistry

DALLAS – Feb. 3, 2010 – Dr. Kim Orth, associate professor of molecular biology at UT Southwestern Medical Center, was honored today with the 2010 Norman Hackerman Award in Chemical Research for pioneering work focusing on the mechanisms bacteria use to cause disease.

The Houston-based Welch Foundation, one of the nation's oldest and largest sources of private funding for basic research in chemistry, presents the award annually to honor up-and-coming scientists at Texas institutions. Recipients are recognized for expanding the frontiers of chemistry through their innovative research.

First bestowed in 2002, the award pays tribute to the late Norman Hackerman, a noted scientist and longtime chairman of the foundation's scientific advisory board. At a luncheon on the UT Southwestern campus, Dr. Orth received the $100,000 award and a crystal sculpture.

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 other immune-system cells that are needed to fight off disease. Dr. Orth's studies of these mechanisms have important implications in medicine, especially in understanding and potentially treating infectious diseases and immune-related diseases.

"Kim Orth is an original and creative biochemist and a tribute to our institution," said Dr. Daniel K. Podolsky, UT Southwestern president. "Her discovery of novel chemical modifications of proteins by bacteria that enter and kill cells is an important achievement. The groundbreaking advances made by her laboratory provide the foundation for a better understanding of many significant infectious diseases."

With the addition of Dr. Orth, four of the nine Hackerman Award recipients have been UT Southwestern faculty members. Other winners from the medical center are Dr. Xiaodong Wang, professor of biochemistry, in 2003; Dr. Zhijian "James" Chen, professor of molecular biology, in 2005; and Dr. Patrick Harran, former professor of biochemistry, in 2007.

"Kim Orth has already made important contributions to our understanding of how bacteria cause disease and what proteins control signaling in the cell," said Ernest H. Cockrell, chairman of The Welch Foundation. "Her creative, innovative and collaborative research tackles critical questions

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affecting humankind and lays a solid foundation for building new knowledge. We are pleased to salute her contributions as a young researcher and look forward to further advances from her lab."

Dr. Orth's studies also have uncovered previously unknown mechanisms human cells use to carry out normal functions. For example, she found 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.

"There is so much more to learn about the most fundamental mechanisms of life. Investing in basic research now pays dividends decades into the future," Dr. Orth said. "I am incredibly honored to be selected for this award, and I want The Welch Foundation to know how much I appreciate its support for basic science."

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 Ph.D. 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.

Since its inception in 1954, the Welch Foundation has supported basic chemical research in Texas through grants to researchers and chemistry departments at colleges and universities; funding of endowed chairs; an annual chemical research conference; and a summer program for high-school students, among other initiatives.

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