

SOUTHWESTERN NEWS

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Two UT Southwestern researchers named Howard Hughes Medical Institute investigators

DALLAS – March 21, 2005 – Two UT Southwestern Medical Center scientists, Dr. Zhijian “James” Chen and Dr. Michael Rosen, whose research programs span the forefront of chemistry and biology, were named Howard Hughes Medical Institute investigators today.

They are the only investigators from Texas out of 43 nationwide named this year by the Howard Hughes Medical Institute (HHMI), a philanthropic organization that promotes biomedical research. With Drs. Chen and Rosen, UT Southwestern has 12 current faculty members who are HHMI investigators.

“We are honored to add Dr. Chen and Dr. Rosen to our team of HHMI investigators,” said Dr. Kern Wildenthal, president of UT Southwestern. “These researchers are among the most promising in the world, and the selection process is highly competitive. Their contributions to science and medicine will undoubtedly make a huge impact on our lives in the future.”

Dr. Chen, a member of UT Southwestern’s molecular biology department, is the 2005 recipient of the Norman Hackerman Award in Chemical Research. He studies a small protein called ubiquitin, so named because it is ubiquitously found in nature. Ubiquitin was originally described as a molecular flag planted on proteins that were destined to be destroyed. The flag allows a cell’s disposal system to distinguish between proteins still in use and those that are primed for destruction.

Dr. Chen’s most dramatic discovery came from studying proteins involved in cell communication or “signaling,” where he observed a second, extremely different role for ubiquitin. Dr. Chen found that certain proteins in the cell, when tagged with ubiquitin, were actually turned on instead of destroyed.

Once activated by this chemical tag, proteins send signals inside the cell. Responses to these signals determine cell growth and division, survival or death. Dr. Chen studies how these signals affect cells of the immune system.

The ultimate goal of his research, said Dr. Chen, is to better understand the role of ubiquitin-based signaling in the immune system, as well as other systems in the body.

Dr. Chen received his Ph.D. in 1991 from the former State University of New York at Buffalo and completed a postdoctoral fellowship at the Salk Institute for Biological Studies. For five years, Dr. Chen worked in industry and in 1997 he joined the UT Southwestern faculty.

"I am thrilled to be honored in this way by the Howard Hughes Medical Institute," Dr. Chen said. "It's a tremendous honor and a huge responsibility. UT Southwestern offers a collegial and supportive atmosphere where excellence in science is a top priority."

Dr. Michael Rosen, who works in the biochemistry and pharmacology departments, is interested in the smallest of skeletons, which are found inside every cell. The cytoskeleton is responsible for helping cells move, change shape and respond to various environmental cues.

The rearrangement of the cytoskeleton is very important in neurons and immune cells. The elongation of growing nerves in the right direction is dependent on adjustments in the cytoskeleton.

The cytoskeleton of the immune cell can change rapidly, allowing it to squeeze through very narrow openings in blood vessel walls to travel to the site of infection. Their exit strategy from the blood vessel also involves changing the shape of the cell to squeeze through small openings.

Dr. Rosen studies the basic building block of the cytoskeleton, a protein called actin. Single actin molecules assemble in chains to form long crisscrossed threads inside the cell.

Understanding both the biology and the physical control of the actin cytoskeleton and its relationship to signaling proteins in the cell are fundamental questions Dr. Rosen is trying to answer. These questions are addressed using techniques such as nuclear magnetic resonance (NMR) spectroscopy, which takes advantage of the way magnetic fields affect atomic nuclei to determine the structure of complex molecules such as proteins.

Dr. Rosen received a Ph.D. in chemistry from Harvard University in 1993. After a postdoctoral fellowship at the Samuel Lunenfeld Research Institute of Mount Sinai Hospital in Toronto, he joined the faculty of the Memorial Sloan Kettering Cancer Center before coming to UT Southwestern in 2001.

"It's a tremendous honor to be recognized by the Howard Hughes Medical Institute," Dr. Rosen said. "Being an HHMI investigator gives me the opportunity to do daring research with the

highest potential impact, and UT Southwestern's collaborative environment is the perfect place to conduct that research."

In this year's national competition, the 43 new investigators were selected from 31 institutions. More than 200 institutions nominated more than 300 scientists, a spokesman for HHMI said.

Other HHMI researchers at UT Southwestern are Dr. Johann Deisenhofer, professor of biochemistry; Dr. David L. Garbers, professor of pharmacology and biochemistry; Dr. Nick V. Grishin, assistant professor of biochemistry; Dr. David J. Mangelsdorf, professor of pharmacology; Dr. Rama Ranganathan, associate professor of pharmacology; Dr. Stephen R. Sprang, professor of biochemistry; Dr. Thomas C. Südhof, director of the Center for Basic Neuroscience and professor of molecular genetics; Dr. Xiaodong Wang, professor of biochemistry; Dr. Masashi Yanagisawa, professor of molecular genetics; and Dr. Helen Hobbs, director of the Eugene McDermott Center for Human Growth and Development and chief of clinical genetics.

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