

SOUTHWESTERN NEWS

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HILGEMANN NAMED YOUNG INVESTIGATOR OF YEAR BY BIOPHYSICAL SOCIETY

DALLAS — March 4, 1997 — The international Biophysical Society has named UT Southwestern physiology professor Donald W. Hilgemann its 1997 Young Investigator of the Year in recognition of his study of systems that move molecules such as calcium and sodium across cell membranes.

Presentation of the annual honor, given for outstanding contributions in biophysics, will be awarded tonight at the international society's meeting in New Orleans. Hilgemann will give a speech titled, "Regulation of Ion Channels and Transporters by Inositol Containing Phospholipids."

One important breakthrough by Hilgemann in biophysical research is the giant patch clamp that allows researchers to measure the movement of ions — sodium, calcium and other nutrients — through the cell membrane. Hilgemann's clamp is a refinement and improvement of a previous device invented by biophysicist Dr. Bert Sakmann, who won the 1991 Nobel Prize in physiology or medicine for the clamp. Sakmann, of the Max Planck Institute for Biophysics in Göttingen, Germany, nominated Hilgemann as the society's Young Investigator of the Year.

The giant clamp allows scientists to measure the electrical movements and properties of the ionic transporters and channels 10 times faster and in more detail than was possible before. It measures the properties of these elements in a millionth of a second using 100 to 1,000 times more cellular membrane.

"We thought we were missing information needed to understand how these kinds of systems in the membrane function to transport ions," Hilgemann said. "We also were missing a lot of information about how these ions were regulated."

The patch clamp is a piece of membrane stuck to a glass pipette. "It lets us study a

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great variety of membrane transport systems that previously could not be studied at all including the cytoplasm — the inside of the cell," he said. "Now we can study this with extremely high time resolution in terms of how many molecules are being moved."

"It enables us to be able to probe much more carefully how the systems work and how they are regulated," Hilgemann said. "Before we were just guessing what was going on inside the cell."

"Now we can study how a protein grabs what it wants to move and how it moves it across the membrane," he said. "It's been a treat to have this much success with it."

Hilgemann said that he did not expect to receive the prestigious award but was gratified because it "shows that my work has been appreciated."

Hilgemann and his research team now are concentrating on regulation of ion transporters and channels, especially the sodium-coupled transporters including a sodium/calcium cardiac exchange system.

"In just the last two years we really broke new turf in understanding how important transporters in the membrane that control contraction of the heart and control secretion of enzymes such as insulin are regulated," he said. "Our job here is to understand how proteins work, and how they work together; how they do what they do."

Dr. James Stull, chairman of the UT Southwestern physiology department, said that Hilgemann's research has provided information that is valuable research worldwide. "His work is allowing scientists to do things that have never been done before. The giant clamp has had a profound impact on what we do."

A native of Iowa, Hilgemann received his bachelor's and master's degrees in biology at the University of Tübingen in Germany and his doctorate there in pharmacology and physiology. He came to UT Southwestern as an assistant professor in 1988 and became an associate professor in 1991 and a professor in September 1996.

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