

UCSD researcher wins national fellowship competition

August 12, 1997

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UCSD RESEARCHER WINS NATIONAL FELLOWSHIP COMPETITION

Volkhard Helms, a post-doctoral researcher in the Department of Chemistry and Biochemistry at the University of California, San Diego, has been selected as a 1997 fellowship winner in the Burroughs Wellcome Program in Mathematics and Molecular Biology.

The \$30,000 award will support Helms' studies of protein functions through computational methods.

A native of Freiburg, Germany, since August 1996 Helms has been conducting research in the laboratory of J. Andrew McCammon, holder of the Joseph E. Mayer Chair of Theoretical Chemistry and professor of chemistry, biochemistry and pharmacology at UCSD.

Helms' latest studies analyze motion associated with the functioning of proteins. Such movement can be critical in mechanical functions for motor proteins and activating and deactivating enzymes.

Although Helms says such movements increasingly have been documented, he notes that the time required to execute them and their underlying energetic forces have largely remained a mystery.

"While we know the movement is often induced by the binding of a ligand (a small organic molecule), what is often not clear is how the ligand diffuses inside the protein, whether it binds to a completely open or partially open protein and how its binding modifies the dynamic and energetic properties of the protein," says Helms. "It's also unclear whether the protein conformational change is a very fast or a slow process."

Armed with a thorough understanding of the binding process, Helms says research could eventually lead to dissecting protein signaling pathways and possibly one day to the design of molecules that block cancer and cell death. "It's useful to be able to dissect these steps," Helms says.

Helms' computational research is aided by linking with resources at the San Diego Supercomputer Center.

The Program in Mathematics and Molecular Biology, or PMMB, is a multi- university national research and training consortium funded by the National Science Foundation and the Burroughs Wellcome Fund and headquartered at Florida State University. The 9-year-old program's goal is the expansion of mathematics applications, including statistics and computer science, to molecular biology. The focus is developing mathematical and computational tools for designing and analyzing experiments on key questions in molecular biology.

Helms joins six new PMMB national fellows and four second-year fellows. The PMMB award is Helms' third fellowship since 1992. He received a four-year pre- doctoral fellowship at the European Molecular Biology Laboratory in Heidelberg, Germany, and a post-doctoral fellowship in August 1996 from the North Atlantic Treaty Organization.

Helms, 31, received undergraduate and doctoral degrees in physics at the University of Munich. He lives in La Jolla with his wife Regina and daughter Isabella.

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