WAYNE STATE UNIVERSITY
SCHOOL OF MEDICINE

1868

Department of Biochemistry
and Molecular Biology

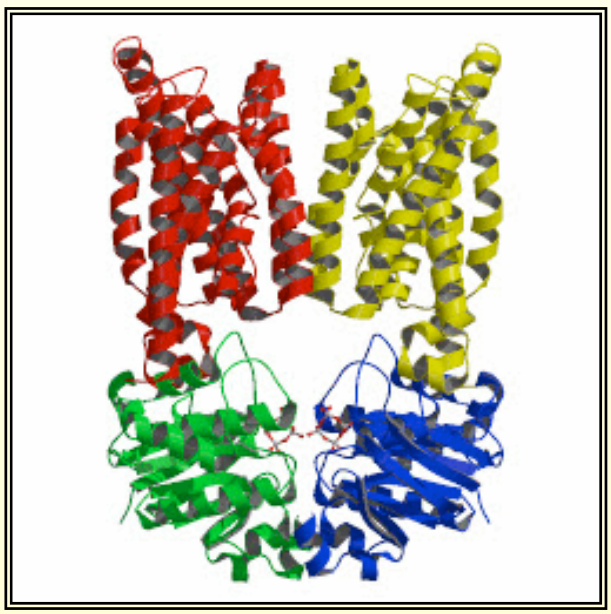
The 13th Aline U. and James M. Orten Memorial Lecture

Douglas C. Rees, Ph.D.

Howard Hughes Medical Institute
and
The Broad Center for the Biological Sciences
Division of Chemistry and Chemical Engineering
California Institute of Technology

Structural Studies of ABC Transporters

ABC transporters are ubiquitous membrane proteins that couple ATP hydrolysis to the translocation of diverse substrates across cell membranes. Clinically relevant examples are associated with cystic fibrosis and with multidrug resistance in pathogenic bacteria and cancer cells. The structure of BtuCD (right), an *E. coli* protein that mediates vitamin B12 uptake, reveals key features common to all ABC transporters.



Tuesday, October 17, 2006
Noon
Room 2268 Scott Hall

About Professor Rees:

Douglas C. Rees, a native of New Haven, Connecticut, received his B.S. (*summa cum laude)* and Ph.D. in Biophysics from Yale University, following which he was a postdoctal fellow with William Lipscomb at Harvard University. He was an assistant and associate professor at the University of California, Los Angeles and is presently Roscoe Gilkey Dickinson Professor of Chemistry at California Institute of Technology. His many honors and awards include Westinghouse Science Scholarship, NSF Presidential Young Investigators Award, Searle Foundation Scholar, Alfred P. Sloan Research Fellow, Wilson Prize Lecture, Harvard Chemistry Department, Fellow, American Academy of Arts and Sciences. Dr. Rees is a member of the National Academy of Science and a Howard Hughes Medical Institute Investigator. He has published over 200 original articles in the world's major scientific journals. His research emphasizes the general area of structural bioenergetics, which seeks to describe the molecular basis of energy transduction processes. Crystallographic analyses provide the foundation for determining the relationships between enzyme structure and function, particularly for electron-transfer based energy transduction pathways involving both water-soluble and membrane proteins. Structural studies have also addressed the fundamental energetic interactions that determine and stabilize macromolecular structures, especially for membrane proteins and hyperthermostable proteins. The Rees group has established the structures of complex metalloproteins with molybdenum and tungsten containing cofactors, and of integral membrane proteins. The metalloprotein work defined the unusual structures of the nitrogenase FeMo-cofactor and the more widespread Mo-cofactor that participates in basic reactions of the biological nitrogen and sulfur cycles. His structure of the BtuCD ABC transporter is a model for these ubiquitous membrane proteins, which include clinically relevant proteins such as those associated with cystic fibrosis and multidrug resistance of pathogenic bacteria and cancer cells.

The Orten Lectureship:

Dr. James M. Orten was a respected faculty member in the Department of Biochemistry from 1937 until his retirement in 1975, when he continued as Professor Emeritus of Biochemistry until his death on March 2, 1991. He was an excellent teacher and was popular among students. He was well known for his text books in biochemistry and for his research in the areas of porphyrin-heme biosynthesis, nutrition and intermediary metabolism. For his contributions, Dr. Orten was elected a Fellow of the American Institute of Nutrition. Dr. Aline U. Orten received her Ph.D. in biochemistry from Yale University in 1937 and came to the Wayne State University School of Medicine later that year as an instructor of physiological chemistry. Over the next half-century, the Ortens served as dedicated members of the Wayne State community.

The James M. Orten Memorial Fund was established through the generous donations of Dr. Aline U. Orten, as well as friends of the Ortens. The fund was created to benefit graduate and postdoctoral students in the Department of Biochemistry and Molecular Biology. It allows the graduate students and postdoctoral associates to invite a renowned researcher in the field of biochemistry and molecular biology to present the James M. Orten Lecture. In addition it gives them an opportunity to meet with and interact personally with an internationally renown scientist. Upon her death on February 16, 2000, the fund was renamed the Aline U. and James M. Orten Memorial Lecture to honor both Drs. Orten.