

Molecular Basis of Disease



as Charcot-Marie-Tooth Disease Renal Fibrosis Alzheimer's

Charles Sanders

Professor, Biochemistry Lyle and Lange Chair of Cardiovascular Research, Biochemistry

CURRENT RESEARCH

Unraveling defects in membrane proteins that cause disease

Whether a protein folds correctly and can fulfill its job in the human body can determine whether an individual will be healthy or will suffer from disease. Therefore, it is necessary to understand the difference between healthy proteins and those that are defective due to mutations or other disease-promoting factors. Dr. Charles Sanders of Vanderbilt University focuses on discovering how defects in a major class of proteins--membrane proteins--result in diseases, specifically Alzheimer's disease, Charcot-Marie-Tooth disease, kidney fibrosis, and heart rhythm disorders. His lab uses chemical and physical methods to compare and contrast membrane proteins under both healthy and disease conditions. By understanding how defects in specific membrane proteins result in various diseases, knowledge-based strategies to treat these diseases can be developed.

Disease-related human membrane proteins are among the most difficult to study of the 22,000 different human proteins. Dr. Sanders has dedicated over 20 years of research to these proteins. This experience enables him and his team to tackle membrane protein-disease relationships. Their work provides a bridge between fundamental biochemical and biophysical studies of isolated proteins and studies of proteins in their native cellular environment. Perhaps as important as his research, Dr. Sanders remarks that educating tomorrow's scientists is essential as he is "training lab members how to conduct themselves as scientists and how to choose problems that matter." Placing an emphasis on diversity, curiosity, and collaboration, Dr. Sanders' laboratory produces not only rigorous medically-translatable research but also scientists who will participate in making...

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AFFILIATION

Vanderbilt University

EDUCATION

- NIH Postdoctoral Fellow, 1991
- Yale University
- Ph.D. in Chemistry, 1988
- The Ohio State University
- B.S. in Chemistry and Mathematics, 1983
- Milligan College

AWARDS

- Established Investigator, American Heart Association, 1994-1999
- Fellow of the American Association for the Advancement of Science, 2009
- Chancellor's Award, Vanderbilt University, 2010
- Anatrache Membrane Protein Award, Biophysical Society, 2012
- Hans Neurath Award, The Protein Society, 2013

RESEARCH AREAS

Life Science, Cardiovascular, Metabolic / Diabetes, Neurological / Cognitive

FUNDING REQUEST

Your contributions will support the continued research of Dr. Charles Sanders of Vanderbilt University as his lab examines how defects in disease-linked membrane proteins result in disorders such as Alzheimer's disease. In choosing to support his research, you will play roles in deciphering the underlying causes of disease, rationally formulating therapeutic strategies, and training the next generation of biomedical researchers.