

Biosketch

Chuck was born in Columbus, Ohio and did his undergraduate work at Milligan College, TN, followed by his Ph.D at The Ohio State University and an NIH postdoctoral fellowship at Yale University. He joined the faculty at Vanderbilt in 2002 following a decade on the faculty at **Case Western Reserve University.** Among other honors he is the recipient of the 2013 Hans Neurath Award of the Protein Society and the 2012 Anatrace Membrane **Protein Award of the Biophysical** Society. He served 13 years as an Associate Editor and then Acting **Editor-in-Chief of the ACS journal Biochemistry.**

Key Publications

"Mechanisms of KCNQ1 Channel Dysfunction in Long QT Syndrome Involving Voltage Sensor Domain Mutations," *Science Advances*, 4, eaar2631, 2018

"The Amyloid Precursor Protein has a Flexible Transmembrane Domain and Binds Cholesterol," *Science*, 336, 1168-1171, 2012

"Implications of the differing roles of the β 1 and β 3 transmembrane and cytoplasmic domains for mammalian integrin function," *eLife*, e18633, 2016



Basic Sciences

Charles (Chuck) R. Sanders, PhD

Professor of Biochemistry Associate Dean for Research Aileen M Lange and Annie Mary Lyle Chair in Cardiovascular Research Professor of Medicine

chuck.sanders@vanderbilt.edu 615-936-3756 http://structbio.vanderbilt.edu/sanders

"How do human membrane proteins contribute to various diseases?"

The Sanders lab uses the tools of **Biochemistry, Structural Biology**, and **Chemical Biology** to explore the roles of membrane proteins in human diseases. Specific questions being addressed include:

- How does the binding of cholesterol to the **amyloid precursor protein** promote **Alzheimer's disease**?
- How does a healthy TREM2 receptor help suppress neuroinflammation that otherwise might accelerate Alzheimer's, Parkinson's, and other neurodegenerative diseases.
- Can folding defect in human **peripheral myelin protein 22** be suppressed with pharmacological chaperones as a route to treating the common peripheral neuropathy, **Charcot-Marie-Tooth disease**?
- How do the more than 600 known mutations in the KCNQ1 potassium channel act to alter the function of this channel, resulting in the long-QT syndrome (LQTS) cardiac arrhythmia and associated sudden death? Can this information be leveraged to help predict patient predisposition to LQTS for preventive personalized/precision medicine?
- What roles do cell surface integrin receptors play in promoting fibrosis in chronic kidney disease, the most common killer of patients with type II diabetes?



How Defects in the KCNQ1 Potassium Channel Cause Long QT Syndrome Cardiac Arrhythmia



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How Cholesterol Promotes Alzheimer's Disease



How Mutations in Peripheral Myelin Protein 22 Cause Charcot-Marie Tooth Disease



How Integrin Receptors Link Cells To Surrounding Tissue in Health and Kidney Disease