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Unlocking the membrane proteome: New opportunities for diagnostics and therapeutics


Integral membrane proteins provide the interface between cells and their environment. As doors and windows of the cell, some inside the cell also, they control essential processes with abject precision. Therefore they offer many drug targets for control of disease. In humans, the serotonin transporter, the glucose transporter, and many drug resistance drug exporters are prime examples. In pathogenic organism's essential transporters and membrane viral restriction factors play essential roles that if blocked or otherwise modulated provide new avenues to therapeutics. Using several examples, I outline the new horizons available with integral membrane proteins as new technologies have opened the way. Targeting by organic compounds as drug leads and by antibody therapeutics are possible. Ways of presenting purified membrane proteins for antibody selection and maturation are presented. As new technologies are developed the molecular structures of membrane proteins can

be obtained by X-ray and cryo electron microscopy methods. I will present inroads into these processes.

Speaker Biography

Robert M Stroud is Professor of Biochemistry and Biophysics, University of California in San Francisco. He focuses on the molecular basis for function of transmembrane transporters and channels, and on structure-assisted drug discovery. He has contributed to fundamental mechanisms of receptor proteins, lipid-protein interactions, enzymes and protein-RNA recognition. He has obtained his BA and MA in Natural Sciences from the University of Cambridge (UK), his PhD is from University of London (JD Bernal). From a Postdoctoral and Professorship in Biological Chemistry at the California Institute of Technology, he came to UCSF. His research involves structural determination engineering and function of molecules and cells using X-ray crystallography, electron-cryo microscopy, computational simulations, spectroscopy, super-resolution optical microscopy. He is a Member of the National Academy of Sciences, a Fellow of the American Academy of Arts and Sciences, a Fellow of the Royal Society of Medicine (UK), Fellow and Former President of the US Biophysical Society.

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