Lecture Title:

Critical Targets and Drug Design to Combat Covid-19

Abstract: The COVID-19 pandemic, caused by SARS-CoV-2, has created an unprecedented health crisis unlike anything that the world has experienced in over 100 years. To date, we do not have any approved drug treatment or vaccine to treat COVID-19. Thus, the development of effective antiviral drugs is critically important. The SARS-CoV-2 replication cycle provides a number of attractive biochemical targets for drug development. These include, cell surface receptors, proteolytic enzymes, and RNA dependent RNA polymerase among others.

This presentation will highlight drug discovery and medicinal chemistry efforts leading to important work that has set the stage for the development of effective therapy against COVID-19 and other pathogenic coronaviruses.

Biosketch: Professor Arun Ghosh was born and raised in Calcutta, India. He received his B. S. degree in Chemistry from the R. K. Mission Residential College under the University of Calcutta. He obtained a master's degree in chemistry from the Indian Institute of Technology at Kanpur. He then attended University of Pittsburgh for his graduate studies. He obtained his PhD degree in chemistry in 1985. He pursued postdoctoral research at Harvard University (1985-1988). He was a research fellow at Merck Research Laboratories, West Point, PA. In 1994, he joined the chemistry faculty at the University of Illinois, Chicago as an assistant Professor and became full Professor in 1998. In 2005, he moved to Purdue University where he is a Distinguished Professor at the Department of Chemistry and also Department of Medicinal Chemistry & Molecular Pharmacology. Professor Ghosh's broad research interests include: exploration of chemistry and biology of bioactive natural products, development of tools and strategies for protein structure-based molecular design, drug-discovery and development, and exploration of new reactions and their applications. He has a proven record of innovative drug design based upon protein targets. He is the inventor of frontline therapy, Darunavir for treatment of HIV/AIDS. His laboratory carried out seminal groundwork for BACE inhibitor design and synthesis for treatment of Alzheimers' Disease. Professor Ghosh and colleagues also laid the foundation for X-ray structure-based design and synthesis of potent drug-like cysteine protease inhibitors for SARS coronaviruses. This research provided the first proof-of-principle that SARS-3CLpro and SARS-PLpro are viable targets for drug development against pathogenic coronaviruses, may now be significant to fight COVID-19.