THE MATERIALS SCIENCE AND ENGINEERING DEPARTMENT
WINTER COLLOQUIUM SERIES PRESENTS:

Goll Lecture: Gerard C.L. Wong

Professor of Bioengineering and Chemistry

University of California, Los Angeles

Understanding the origins of COVID lethality: Molecular biomimicry of host immune machinery by the SARS-CoV-2 virus and consequences for severe inflammation, coagulation, and antiviral responses

The three most salient features of COVID-19 are its lethality for a significant human subpopulation, its high infectivity, and its heterogeneity of outcomes, ranging from essentially no symptoms to death. Its lethal pathologies include 1) amplified forms of inflammation (Acute Respiratory Distress Syndrome (ARDS), cytokine storms, septic shock) and 2) dysregulated forms of coagulation (severe blood clots that lead to cardiac events, multi system inflammatory syndrome in children (MIS-C)). At present, it is not clear how these consequences are induced, or how they relate to in milder pathologies observed in the clinic, such 'COVID fingers' or arthritis-like syndromes. By combining machine learning, synchrotron structural studies, computer simulations, in vitro cell based experiments, in vivo mouse experiments, and analysis of human COVID patient samples, we show how immune processing of SARS-CoV-2 can potentially precipitate these outcomes, via a novel form of biomimicry that results in grossly distorted immune responses, coagulation pathologies, and suppression of type I interferon-based antiviral defenses, whereas that of other non-pandemic coronaviruses cannot.

Gerard C.L. Wong is a Professor in the Department of Bioengineering and Department of Chemistry at UCLA. He received his BS and PhD in physics at Caltech and Berkeley. He joined the Materials Science Department and Physics Department at the University of Illinois at Urbana-Champaign in 2000 and was recruited to UCLA in 2009. His research recognition includes a Beckman Young Investigator Award and an Alfred P Sloan Fellowship. He is a Fellow of the American Physical Society, a Fellow of the American Academy of Microbiology, and a Fellow of the American Institute for Medical and Biological Engineering.

Tuesday, March 8 • 4 pm CT • Tech L211

Also viewable via Zoom! • Meeting ID: 924 7129 0707

Questions? Contact elena.lindstrom@northwestern.edu.

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