

# ASRC - City College of New York

## Seminar in Biochemistry, Biophysics & Biodesign

### SEMINAR LOCATION:

**ASRC Main Auditorium**  
**85 St. Nicholas Terrace**

For non-CUNY attendees, advance registration is required; please contact Hyacinth Camillieri at

[hcamillieri@gc.cuny.edu](mailto:hcamillieri@gc.cuny.edu)

THE SEMINAR WILL ALSO BE AVAILABLE VIA ZOOM:

[Click here for Zoom link](#)

Meeting ID: 916 3796 4386

Passcode: asrc+ccny

### HOST:

Daniel Keedy

[dkeedy@gc.cuny.edu](mailto:dkeedy@gc.cuny.edu)

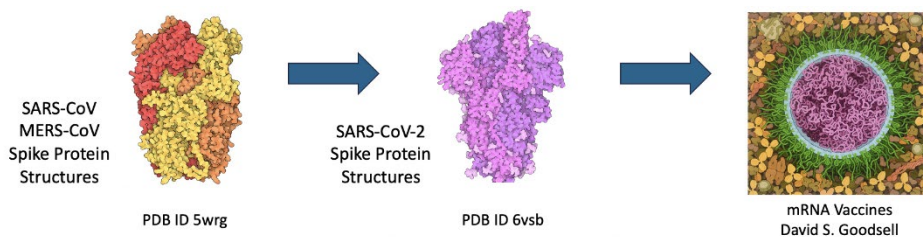
### FOR MORE INFORMATION, CONTACT:

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**Wednesday, March 6, 2024**

Coffee & tea 11:30 AM

**Seminar 12:00-1:00 PM**

## Stephen K. Burley

University Professor and Henry Rutgers Chair

Director, RCSB Protein Data Bank

Founding Director, Rutgers Institute for Quantitative Biomedicine

## Protein Data Bank: From Two Epidemics to the Global Pandemic to mRNA Vaccines and Paxlovid

**ABSTRACT** Structural biologists around the world and the Protein Data Bank (PDB) played decisive roles in combating the COVID-19 pandemic. This talk will explain how global three-dimensional (3D) biostructure data was turned into global knowledge, allowing scientists and engineers around the world to understand the inner workings of coronaviruses and develop effective countermeasures against SARS-CoV-2.

State-of-the-art mRNA vaccines, initially designed with guidance from single-particle cryoelectron microscopy structures of the SARS-CoV and MERS-CoV Spike Proteins, benefited more than five billion individuals around the world by preventing viral infections entirely or significantly reducing morbidity and mortality. Structure-guided drug discovery efforts at Pfizer, first initiated in the 2000s in response to the SARS-CoV epidemic and reactivated in 2020 early in the global pandemic, yielded nirmatrelvir—a potent, orally-bioavailable, covalently-acting, peptidomimetic inhibitor of the SARS-CoV-2 Main Protease. This targeted antiviral drug received Emergency Use Authorization from the United States Food and Drug Administration in December 2021, less than two years following public release of the viral genome sequence. It is used clinically for the treatment of acute SARS-CoV-2 infections in a fixed dose combination with ritonavir and sold under the brand name Paxlovid.

Bolstered by open access to research data generated with public and private monies, particularly 3D structures of coronavirus proteins archived in the PDB, basic and applied researchers made a difference when the world desperately needed them to succeed. To underscore the importance of these contributions, I quote Dr. Anthony Fauci, former head of the National Institute of Allergy and Infectious Disease, “Show me a person who’s vaccinated, got infected, took Paxlovid and died. I can’t find anybody.”

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