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

THE SEMINAR WILL ALSO BE AVAILABLE VIA ZOOM:

Click here for Zoom link
Meeting ID: 916 3796 4386
Passcode: asrc+ccny

HOST:
David Jeruzalmi
David.Jeruzalmi80@login.cuny.edu

FOR MORE INFORMATION, CONTACT:
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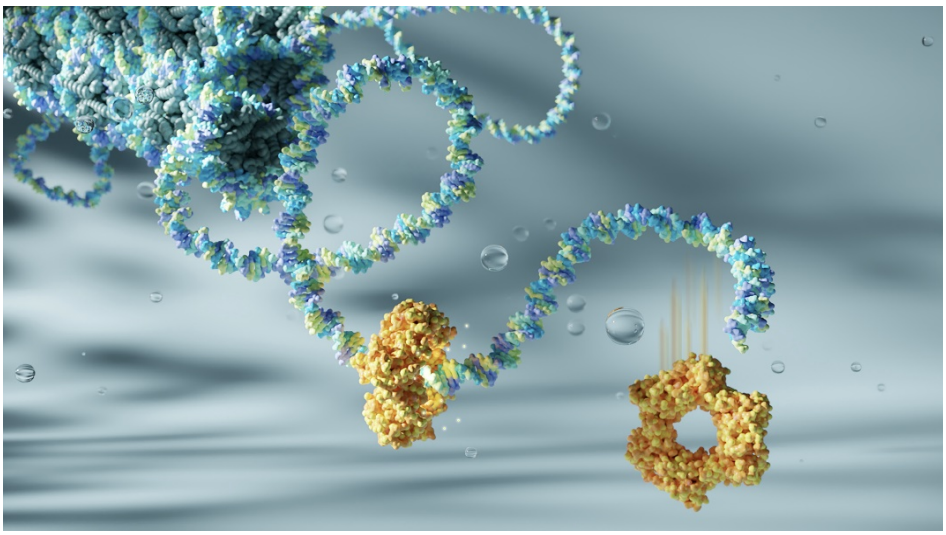

Wednesday, March 27, 2024
Coffee & tea 11:30 AM
Seminar 12:00-1:00 PM

Brian Kelch

Associate Professor, Dept. of Biochemistry & Molecular Biotechnology
University of Massachusetts Chan Medical School, Worcester, MA

Peering under the hood of Nature's macromolecular machines: motors, rings, springs and things

ABSTRACT The Kelch Lab studies how large macromolecular machines function, focusing on the machinery underlying DNA replication and virus assembly. The replication machinery copies DNA with both high-speed and high-fidelity due to a circular sliding clamp to physically tether the DNA polymerase to the DNA. This ring-shaped sliding clamp requires a complicated ATPase machine called a Clamp Loader so that it can be correctly installed onto DNA. The Kelch lab studies the detailed mechanisms of clamp loading using a combination of structural biology, biochemistry and genetics. The clamp loader functions as a pentameric ATPase switch that uses a multi-step mechanism to place the sliding clamp onto DNA.

The second part of my talk will focus on the machinery underlying virus function, which provides a fascinating example of self-assembly into a multi-partite molecular machine. Our studies of thermophilic viruses have revealed novel principles underlying virus stability and capacity. We also have revealed the mechanism of a molecular motor that is a pentameric ATPase similar to the clamp loader, but acts as a powerful and processive motor instead of a switch. I will discuss basic principles for ATPase function gleaned from our comparison of these two similar but distinct ATPase machines.