ASRC - City College of New York

Seminar in Biochemistry, Biophysics & Biodesign

THIS SEMINAR WILL BE GIVEN VIA ZOOM:
Click here for Zoom link
Meeting ID: 916 3796 4386
Passcode: asrc+ccny

THE ZOOM BROADCAST MAY ALSO BE VIEWED IN THE
ASRC Main Auditorium
85 St. Nicholas Terrace
For non-CUNY attendees, advance registration is required; please contact Hyacinth Camillieri at hcamillieri@gc.cuny.edu

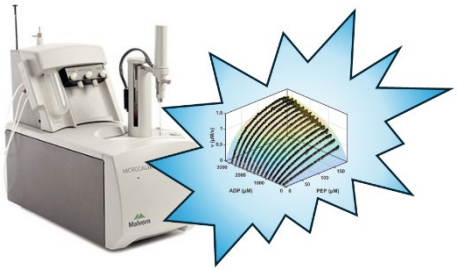
HOST:
Denize Favaro
dfavaro@gc.cuny.edu

FOR MORE INFORMATION, CONTACT:
Lauren Gohara
lgohara@ccny.cuny.edu
(212) 650-8803

The Biochemistry Seminar series is supported in part by The Office of the President; The Foundation for City College; the CUNY Institute for Macromolecular Assemblies; and the Advanced Science Research Center at the Graduate Center of the City University of New York.

ADVANCED SCIENCE RESEARCH CENTER
THE GRADUATE CENTER
CITY UNIVERSITY OF NEW YORK

Wed., March 20, 2024
Coffee & tea 11:30 AM
Seminar 12:00-1:00 PM



Anthony Mittermaier

Professor, Department of Chemistry
McGill University, Montreal, Quebec, Canada

Feeling the Enzymatic Heat: Isothermal Titration Calorimetry as Universal Enzyme Assay

ABSTRACT Isothermal titration calorimetry (ITC) was originally designed for studying host/guest binding interactions but is gaining popularity as general enzyme assay. To characterize enzyme activity, ITC measures the heat released or absorbed by catalysis in real time, following the rapid mixing of enzyme and substrate solutions. Since most chemical reactions are either exothermic or endothermic, ITC can be applied to virtually any enzyme/substrate pair, without the need to design customized reporter molecules, to couple the reaction to additional enzymes, or to perform any post-reaction separation. ITC experiments can be performed under dilute, physiological solution conditions, even with opaque samples and require far less enzyme than traditional ITC binding experiments. Our lab has developed an approach for quantitatively modelling ITC peak shapes in order to apply this technique to rapid reactions that take place on the seconds or tens of seconds timescales. Building on this advance, we have developed a suite of new ITC-based methods that rapidly yield the affinity and the mode of inhibitor binding, product inhibition, and the full kinetic profiles of Bi-substrate enzymes. Recently, we have turned our attention to covalent inhibitors, which form chemical bonds with their targets. They represent a highly promising new frontier of drug development but are challenging to characterize since they generally follow multi-step inhibition mechanisms. We have developed an ITC experiment that quantifies covalent inhibitor activity with greater detail than existing methods, further highlighting the versatility of the calorimetric approach.