



BiophysTO Lunchtime Seminar Series

Date

Thursday, March 10, 2022
12:00 – 1:00 pm

Location

Virtual via zoom

Dr. Alan R. Davidson

Department of Molecular Genetics
Department of Biochemistry
University of Toronto

Anti-CRISPRs do Amazing Things

CRISPR-Cas systems provide adaptive immunity against invasion by foreign DNA in bacteria and archaea. To counteract CRISPR-Cas systems, mobile genetic elements, such as phages, often encode anti-CRISPRs, which are proteins that inhibit CRISPR-Cas systems. First discovered in 2013, there are now more than 90 families of anti-CRISPRs known that block 11 different types of CRISPR-Cas systems. Detailed structural and biochemical studies have revealed a diverse assortment of inhibitory mechanisms for anti-CRISPRs. However, almost all of these mechanisms involve a strong binding interaction between the anti-CRISPR and one or more Cas proteins. This binding usually directly blocks a functional interface of the CRISPR-Cas system or prevents a critical conformational change. In this talk, I will briefly describe how anti-CRISPRs were discovered and the progress that we have made in their characterization. I will also describe the characterization of AcrIF25, a recently discovered anti-CRISPR that inhibits the type I-F CRISPR-Cas system using an entirely novel mechanism. I will show that AcrIF25 rips apart a CRISPR-Cas complex in a manner that is unprecedented for anti-CRISPRs or for any other non-enzymatic protein inhibitor of a large macromolecular complex.

Zoom Link

<https://utoronto.zoom.us/j/83980919272>

Host: Dr. Walid A. Houry



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