Oklahoma COBRE in Structural Biology

The OCSB and Dept. of Chemistry and Biochemistry are pleased to announce a seminar presented by

Dr. Erica Ollmann Saphire

Professor, President and CEO
La Jolla Institute for Immunology

Friday, April 21st 2023
4:15 pm
National Weather Center, Auditorium, Room 1313
120 David L. Boren Blvd, Norman, OK

"Antibody Defense Against Emerging Infectious Disease"

Open to the public, refreshments at 4:00 pm

Antibodies provide a critical line of defense against infectious diseases and are the primary goal of protective vaccines. Antibodies themselves can also serve as therapeutics or as design templates to develop or improve needed vaccines. Understanding the structure, reactivity, breadth, and protective activities of antibodies is key to both therapeutic and vaccine design. We have galvanized global consortia to understand which antibodies are most effective against viruses like Ebola, Lassa, and SARS-CoV-2. These consortia analyzed which antibodies demonstrate potent neutralization, which inspire Fc-mediated effector functions, which exhibit breadth across strains, and which yield durable neutralization despite emergence of highly mutated variants, and why. Results from the Bill and Melinda Gates Foundation-, GHR- and NIAID-funded Coronavirus Immunotherapeutics Consortium (CoVIC) that studied 400 candidate therapeutic antibodies against SARS-CoV-2 afforded fine epitope mapping on the spike protein; these distinctions forecast antibody activities. Structures of CoVIC IgGs in complex with the spike explain why some antibodies retain potency even though the footprint they target is highly mutated, like in the Omicron Variants. The geometry of their IgG recognition allows bivalent binding that confers avidity to preserve neutralization activity. Results of another project, the Viral Immunotherapeutic Consortium (VIC), mapped first-in-class antibody therapies for Ebola Virus Disease (Inmazeb) and Lassa Fever (Arevirumab), explained their mechanism of action and why a cocktail approach that combines complementary functions endows resistance to escape and opens multiple avenues of in vivo protection. For Lassa virus in particular, these studies help explain why neutralizing antibodies against this virus are so rare and provide specific design strategies to develop antigens to find and elicit more potently neutralizing antibodies.

https://www.lji.org/labs/saphire/