UC DAVIS HEALTH | SCHOOL OF MEDICINE

Medical Microbiology and Immunology
MMI 291 Seminar Series
Emerging Challenges in Microbiology and Immunology

MMI 291 Seminar Series

Current Theme: Interdisciplinary Research
Fall Quarter 2024 – CRN 39234

Friday Seminar at 12:10-1 p.m.
GBSF Auditorium, Room 1005

"Poxviruses Reveal the "FEAR" in You!"

Research Bio

Don Gammon received his B.S. degree in Biological Sciences at the University of Windsor (Windsor, Canada) and went on to obtain his Ph.D. in Virology at the University of Alberta (Edmonton, Canada) in the laboratory of Professor David Evans. While at the University of Alberta, Gammon's research helped to elucidate the genetic and biochemical nature of poxvirus resistance to clinically-important acyclic nucleoside phosphonate drugs. In addition, he identified an unusual role for poxvirus DNA polymerase proofreading activity in catalyzing genetic recombination in virus-infected cells. His work also showed that poxviruses usurp host nucleotide biosynthetic machinery by forming novel "chimeric" ribonucleotide reductase enzymes that contain both viral and host proteins. This discovery led to Gammon and Evans obtaining a U.S. patent for the use of ribonucleotide reductase-deficient poxviruses in oncolytic virotherapy. Upon completion of his graduate research, Gammon pursued post-doctoral training in the laboratory of Nobel Laureate, Professor Craig Mello, at the University of Massachusetts Medical School. In the Mello laboratory, he developed novel RNA virus-Lepidopteran (moth and butterfly) host systems to uncover both the immunity mechanisms used by eukaryotic organisms to restrict virus replication as well as the strategies viruses employ to counter such restrictions. These model systems arose from the observation that certain arboviruses undergo an abortive infection in Lepidopteran cells yet can replicate in these cells when host immunity is compromised during co-infection with other viruses, such as poxviruses. Using these model systems, his work has uncovered multiple conserved eukaryotic host factors that restrict arbovirus replication. These studies also identified a new family of highly conserved, microtubule-stabilizing virulence factors encoded by poxviruses that promote virus replication in Lepidopteran and vertebrate hosts. The Gammon laboratory uses a wide variety of cell culture-, virology-, molecular/cell biology, immunology, and biochemistry-related techniques to explore virus-host interplay. Using this multifaceted approach, along with newly-developed virus-host systems, Gammon's team seeks to define the viral and host factors that ultimately determine virus host range and disease outcomes.

Publications

Seo D, Brito Oliveira S, Rex EA, Ye X, Rice LM, da Fonseca FG, **Gammon DB**. "Poxvirus A51R proteins regulate microtubule stability and antagonize a cell-intrinsic antiviral response". *Cell Rep*. 2024 Mar 26;43(3):113882. doi: 10.1016/j.celrep.2024.113882. Epub 2024 Mar 7. PMID: 38457341; PMCID: PMC11023057.

Rex EA, Seo D, Chappidi S, Pinkham C, Brito Oliveira S, Embry A, Heisler D, Liu Y, Munir M, Luger K, Alto NM, da Fonseca FG, Orchard R, Hancks DC, **Gammon DB**. "FEAR antiviral response pathway is independent of interferons and countered by poxvirus proteins". *Nat Microbiol*. 2024 Apr;9(4):988-1006. doi: 10.1038/s41564-024-01646-5. Epub 2024 Mar 27. PMID: 38538832.

September 27

Don Gammon, Ph.D.
Assistant Professor
W.W. Caruth Jr. Scholar in Biomedical Research
Department of Microbiology
UT Southwestern Medical Center

Sep. 27, 2024
12:10 – 1 p.m.
GBSF Auditorium
Room 1005
In-person presentation

Medical Microbiology and Immunology
School of Medicine

Seminar Contact:
Autumn Vega
advega@ucdavis.edu
We hope to see you there!