Biomedical Sciences Seminar
Cosponsored by Neuroscience

presents

“Parasite exploitation of host cell signaling: between rewiring and malignant transformation in Toxoplasma and Theileria"

Guest Speaker: Dr. Philipp Olias, DECVP

Thursday September 12th

WHEN: 12:00pm-1:00pm
WHERE: Vet Med Room 2226
HOST: Dr. Beck

PIZZA SERVED IN FISH TANK LOBBY

Seminar Details

As a way of enhancing intracellular survival, apicomplexan parasites hijack host cell proteins and signaling pathways. The extent to which these pathogens are capable of modulating host pathways ranges from short-term rewiring, as in acute toxoplasmosis, to permanent transformation, as in malignant bovine theileriosis. For Toxoplasma, a wealth of studies over the past years has identified and characterized rhoptry or dense granule proteins such as TgIST that are secreted into the host cell and are responsible for monitored gene expression changes. Tick-transmitted pathogenic Theileria parasites impose a substantial economic burden worldwide and have recently been reported to spread in cattle in the United States. It is surprising how many parallels can be drawn between the cellular manipulations of these different apicomplexan taxa and how they must have independently found ways to manipulate central host pathways such as NFκB signaling. Theileria as a multinucleated, syncytial body in the cytoplasm of the host cell during schizogony is perfectly positioned to interfere with cell signaling pathways by means of secreted proteins and parasite proteins located directly on the schizont membrane. Despite the huge quantity of details reported on altered host signaling that is proposed to mediate the phenotypic changes in Theileria-infected cells, the parasite effectors and network of host proteins involved in this transformation are not well understood. One reason that so few Theileria effector proteins have been fully characterized is the lack of effective tools to genetically modify the parasite. To fully understand the biology of host cell transformation resulting in host pathology, we are using bovine genome-wide CRISPR/Cas9 forward genetic screening technology among other techniques to investigate the composition and roles of putative effector and essential host proteins. In this talk, the mechanisms by which Theileria parasites manipulate their hosts will be explored, with a particular emphasis on the unique host-parasite relationship that has evolved in Theileria transformed leukocytes.

Next Week’s Speaker: Balaji Manicassamy, PhD

Topic: Viral and Host Determinants of Avian H5N1 Influenza Virus Pathogenesis