



LBRN Summer Research Seminar Series



Cat scat fever: Biology of the prevalent human parasite *Toxoplasma gondii*.

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Intracellular parasites represent a significant portion of human disease burden throughout the world. The Apicomplexan parasite *Toxoplasma gondii* is one of the more widespread with estimates of up to a third of the human population having been exposed. Fortunately, most infections do not result in debilitating symptoms as carriers with healthy immune systems are able to control growth of the parasite, but this is not always the case. Toxoplasmosis has been an indicator disease for patients suffering from complications of AIDS since the advent of the HIV viral pandemic. A fetus can be infected from mothers who convert during pregnancy, resulting in 400-4,000 new congenital toxoplasma infections in the U.S. per year. Also, the parasite can thrive in immune privileged areas of the eye, resulting in approximately 5,000 symptomatic ocular toxoplasmosis cases in the U.S. every year. Major routes of human infection are either undercooked infected meat, likely the most common route, or the accidental ingestion of oocysts shed by cats into the environment, for example, from gardening or cleaning cat litter. Recent estimates by the CDC indicate toxoplasmosis is the fourth leading cause of hospitalization and the second leading cause of death by foodborne illness in the U.S today. The ability of *Toxoplasma* to infect such a large number of individuals, approximately 45-60 million in the U.S., results in meaningful disease burden in those individuals where the parasite circumvents normal modes of control. This seminar will cover the biology of *T. gondii* with an additional focus on recent work that has uncovered aspects of global population structure, identification of virulence genes that thwart immune responses, and new opportunities to use stem cell technologies to understand more about parasite development.