Intracellular parasites represent a significant portion of human disease burden throughout the world. The Apicomplexan parasite Toxoplasma gondii is one of the more successful where it is estimated up to a third of the human population has been infected. This high infection rate results in approximately 1.5 million new infections in the U.S. per year. Fortunately, most infections do not result in debilitating symptoms as carriers with healthy immune systems are able to control the growth of the parasite, but control of parasite growth is not always achieved. Toxoplasmosis has been an indicator disease for patients suffering from complications of AIDS since the advent of the HIV viral epidemic. Unborn babies can become infected in 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 via either the ingestion of undercooked infected meat, likely the most common route, or the accidental ingestion of oocysts shed into the environment, for example, by 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.