



**Dr. Jon Patrick Boyle**

Associate Professor

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Dr. Boyle got his Ph.D. in 2003 with Dr. Timothy Yoshino at the University of Wisconsin-Madison, performed his Postdoctoral work with Dr. John Boothroyd at Stanford University, and joined the Department of Biological Sciences as an Assistant Professor in the Fall of 2008. He was promoted to Associate Professor with Tenure in the Fall of 2015. His work has always focused on understanding the complex biology of host-parasite interactions. As a PhD student he performed some of the first experiments using RNA interference in larval stages of the human blood fluke *Schistosoma mansoni*, and he also pharmacologically characterized serotonin transporters on the tegumental surface of this organism. As a postdoctoral fellow he continued working on the biology of host-parasite interactions, this time using the human AIDS-related pathogen *Toxoplasma gondii*. Along with another postdoctoral fellow in the lab, Jeroen Saeij, Dr. Boyle identified multiple *T. gondii* genes, including ROP18 and ROP5, that determined *T. gondii* virulence in the mouse. Since starting his own research group at the University of Pittsburgh, Dr. Boyle has continued work aimed at understanding the molecular determinants for *T. gondii* virulence and host range. His recent work has focused on two main areas. One is on characterizing tandemly-expanded *T. gondii* loci encoding polymorphic secreted effectors that modulate the host cell. Through this work the Boyle lab has identified the genes that are required for parasite-mediated host mitochondrial association (in collaboration with John Boothroyd's Lab at the Stanford School of Medicine), as well as other loci that alter the host cell landscape. The second main area is using comparative approaches to define the evolutionary steps necessary for *T. gondii* to emerge as a globally dominant pathogen. For this work his focus is on two comparator species: *Neospora caninum* and *Hammondia hammondi*. Using comparative genomics, molecular evolution, and cross-species complementation studies, the Boyle lab has identified new roles for previously characterized effector molecules and uncovered new phenotypic differences between *T. gondii* and its near relatives that may drive, on a molecular level, its vast host range and heightened virulence in any number of infection scenarios. Work in the Boyle lab includes both a computational and wet lab component, including tissue culture and the use of small animal models of infection.

**Awards:** Since starting his own lab in 2008 Dr. Boyle received a Pew Scholarship in the Biomedical Sciences (2009), New Investigator grants from the Samuel and Emma Winters Foundation and Oak Ridge Associated Universities, and multiple grants from the National Institutes of Health.