

IFSH Seminar Series

Thursday, March 26, 2015

11:00 AM – 12:00 PM

Bldg. 91, Room 216, Moffett Campus

Jean-François Pombert , Ph.D.

Assistant Professor
Department of Biology
Illinois Institute of Technology

“The *Ordospora colligata* genome; evolution of extreme reduction in microsporidia and host-to-parasite horizontal gene transfer”

Biosketch

Dr. Jean-François Pombert received his Ph.D. from Université Laval (Quebec, Canada). After performing a short-term one year postdoc at the same institution, he moved into a five years postdoc position in Dr. Patrick J. Keeling’s lab at the University of British Columbia (Vancouver, Canada) initiated with a Génome Québec/Louis-Berlinguet Postdoctoral Fellowship. In August 2013, he accepted a faculty position at IIT’s Biology department. Dr. Pombert is a genomics expert with over 15 years of experience in the field. His research revolves around comparative genomics, with an emphasis on finding the elements that distinguish obligate pathogens from their free-living relatives. His work encompasses various bacteria and protists including microsporidia.

Abstract

The smallest known eukaryotic genomes are found in the *Encephalitozoon*, a genus of microsporidian parasites. Their extreme compaction, however, is not characteristic of the group, whose genomes can vary by an order of magnitude. The processes and evolutionary forces that led the *Encephalitozoon* genomes to shed so much of their ancestral baggage are unclear. We sequenced the genome of *Ordospora colligata*, a parasite of the water flea *Daphnia* and the closest known relative of *Encephalitozoon* species, and showed that this extreme reduction predated the split between the two lineages. We also found that *O. colligata* has acquired a septin gene by host-to-parasite horizontal transfer and predicted that the encoded protein folds like a septin 7, which plays a major role in endocytosis. We hypothesize that this acquisition could help *O. colligata* parasitize its hosts by facilitating endocytic infection, a mechanism that occurs in microsporidia but that is not yet well understood.