

Seminar in Microbiology

Monday, December 11th, 2017

Salle de séminaire, E07.3347.a, CMU

11:30 – 12:30

Prof. Inari Kursula

Academy of Finland
Department of Biomedicine
University of Bergen, Norway



Hybrid structural biology towards a molecular picture of the apicomplexan glideosome

Cytoskeletal proteins recognize and bind to each other. Actin - the central protein of the cytoskeleton - polymerizes to form complex structures together with other components of the cytoskeleton and various regulatory proteins. Pathogens use these cytoskeletal complexes for both motility and invasion of their host cells. Once these mechanisms are understood at the molecular - or atomic - level, we can look for ways to interfere with the processes of motility and invasion.

We study the motility and host cell invasion of the parasite causing malaria, which is one of the world's most devastating infectious diseases. Each year, more than half a million people die of malaria. The disease is caused by *Plasmodium* spp., which comprise a group of unicellular, eukaryotic, intracellular parasites. They use an actin-myosin motor complex, termed glideosome, for rapid gliding motility and host cell invasion. The motor components are to a large extent unique to these parasites or highly divergent from the corresponding human proteins. Parasite actin filaments are extremely short, and their rapid treadmilling is regulated by a strikingly small number of actin-binding proteins.

It is these glideosome proteins that are in the limelight of our research: How do the three-dimensional structures of these proteins look like? What do the complexes they form look like and how do they work? How can we interfere with their function? Answers to these questions can be found by means of hybrid structural biology combined with other biophysical and biochemical methodology. We aim to shed light on the structure and function of the entire glideosome complex making the large structures involved visible at high resolution, using the latest methods in photon science.

From: http://cc.oulu.fi/~inkursul/lab/Molecular_mechanisms_of_actin-based_motility/intro.html