CMCA Seminar

Centre for Microscopy,
Characterisation and Analysis

Wednesday 30th August 2017 **11.00am – 12.00 pm**

McCusker Auditorium, Harry Perkins Institute of Medical Research

"Super-resolution and correlative imaging of malaria parasites"

Professor Leann Tilley is the Redmond Barry Distinguished Professor at The University of Melbourne, Australia.

Professor Tilley studied at Melbourne and Sydney Universities, and undertook postdoctoral fellowships at Utrecht University (the Netherlands) and the College de France (Paris), before beginning her independent career. In 2015, she was awarded the Georgina Sweet Australian Laureate Fellowship from the Australian Research Council, recognising her research on malaria pathogenesis and drug resistance. She was awarded the Bancroft-Mackerras Medal from the Australian Society for Parasitology (2010), the Beckman Coulter Discovery Award of the Australian Society for Biochemistry and Molecular Biology (2011) and the Eureka Prize for Infectious Diseases Research (2016). She is President of the Australian Society for Biochemistry and Molecular Biology

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New microscopy techniques are providing amazing views of the cellular landscape. We have used 3D Structured Illumination Microscopy (SIM), direct Stochastic Optical Reconstruction Microscopy (dSTORM), 3D-Electron Tomography and Block-Face Scanning EM to explore the sub-cellular topography of the malaria parasite, *Plasmodium falciparum*.

P. falciparum is the most virulent of malaria parasites, causing ~480,000 deaths per year. Efforts to control malaria need to target both asexual multiplication in red blood cells (RBCs), which causes disease, and sexual development, which is responsible for transmission.

We have probed the changes to the host RBC membrane skeleton that mediate rigidity changes and imaged the virulence complex that the parasite establishes at the RBC surface, which mediates adhesion to blood vessel walls. We have explored the changes in the parasite and host cytoskeletal structures that underpin the remarkable reversible morphology changes that permit sexual blood stages to survive in the circulation ready for transfer to the mosquito vector.

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