Department of Molecular Medicine Seminar Series

Dr Izzy Jayasinghe

University of Sheffield, UK

11 am, Friday 24 March 2023
LG03 Wallace Wurth Building

"Optical microscopy tools for decoding nanoscale cellular signalling & broadening uptake of super-resolution"

How have the continued improvement and strategic adaptation of super-resolution microscopy tools enhanced our understanding of the nanoscale structures underpinning life? I will illustrate some of these advances in visualising the ryanodine receptor (RyR) nanodomains in tissues like the heart, muscle and neurones. Correlative structure-function imaging has allowed us to resolve, observe and identify the RyR clustering patterns which spatially-encode the fast calcium signals within the cells. The recently invented Expansion Microscopy technique has been particularly useful in imaging the three-dimensionally complex RyR nanodomains. I will also present some of the tool development work currently under way to advance the reproducibility, versatility, and accessibility ExM as a bio-imaging tool in the broadest contexts of Life Sciences.

Bio: Izzy Jayasinghe is a Senior Lecturer and a UKRI Future Leader Fellow in the School of Biosciences, University of Sheffield. Her research has focused on developing new optical microscopy techniques for studying the organisation of the molecules of life, particularly proteins, within the heart. Prior to moving to Sheffield, Izzy completed a PhD in Auckland (New Zealand) and two postdoctoral fellowships in Queensland and Exeter (UK) where she established a track record in developing and applying new optical imaging methods. She established her independent research group in the University of Leeds in 2015 where she developed adaptations of optical imaging methods such as DNA-PAINT and Expansion Microscopy to study pathological nanoscale remodelling in the failing heart. Her current research focuses on developing more accessible, faster and higher resolution imaging methods for imaging optically-thick (and biologically more complex) samples. Izzy is a Fellow of the Royal Microscopical Society and advocates for Open Science and Equality and Inclusion in the UK's STEM sector.

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