NANOMATERIALS SPEAKER SERIES

IN THE PURSUIT OF HIGHER RESOLUTION IN LIVE CELL IMAGING

March 24, 2017 at 12:30pm

CBB, Rm 106

This lecture aims to highlight the evolution of lanthanide based cellular stains and expand the theory of SIM through a chronological overview of the key innovations in the field. We continuously seek to develop this fascinating technique further to allow its use by the broad imaging community, so saturation eliminated sub-diffraction spatio- and high temporal resolution 3D reconstructions can be created by simply incorporating modular SIM/ISM attachments into any existing LSCM or epi-fluorescence setup. RGB merge of live-cell images to reveal sub-diffraction experimental lateral and subsequent axial resolution (expansions with respective scale-bars) of SIM, highlight achievable experimental resolution differences between standard LSCM and PhMoNa. (Red) A PhMoNa enhanced Eu(III)dye (Cloading= 10 μM / 2 h, λex= 355 nm) co-stained with commercial MitoTracker Green (green) (Cloading= 200 nM / 30 min, λex= 488 nm) revealing enhanced ~60 nm (red channel) and standard ~200 nm (green channel) lateral resolution respectively (2048 x 2048 pixel, 400 Hz, 4 line-averaging sequence, x63/1.40NA) of the mitochondrial network of NIH3T3 mouse skin fibroblast cells.

Robert Pal

Research Fellow

Department of Chemistry

Durham University

SPEAKER BIO

Robert Pal grew up in Hungary and graduated with the Highest Achievement award in Chemistry from KLTE University of Debrecen. In 2004 he has moved to Durham to start a Ph.D with Prof. David Parker on Responsive Luminescent Lanthanide systems. Completing his Ph.D in late 2007 he began to work as a Postdoctoral researcher within the Parker group, also working closely with Prof. Andrew Beeby, moving away from organic chemistry towards bio-physical chemistry, spectroscopy and microscopy. In 2014 he has been awarded with a prestigious University Research Fellowship from the Royal Society to study the Development and Chemical Application of Phase Modulation Nanoscopy. Robert is also the Technical Director of two successful University spin out company, SynDex Inst. and FScan Ltd. the later which has developed lanthanide technology to measure the level of citrate in seminal fluid samples for PCa detection. His research interests are focused around the development of novel optical and super-resolution microscopy instrumentation and associated time-resolved techniques. His research group also maintains an interest in lanthanide based sensors and imaging agents, including organelle specific probes and alternative responsive stains and Circularly Polarised Luminescence, Fast Multi-point Raman spectro/microscopy and Unimolecular Nanomachines for Selected Therapeutics .

Contact Professor Xiaonan Shan at xshan@uh.edu if you would like to arrange for a time to meet with Dr. Pal.

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