COMPARE

CENTRE OF MEMBRANE PROTEINS AND RECEPTORS

Newsletter

Edition 19 October 2019

Welcome

Julie Rayes has joined COMPARE as a COMPARE Fellow in the University of Birmingham.

Julie's research will focus on the crosstalk between innate immunity and thrombosis/haemostasis.

"I am interested in the role of platelets in thrombo-inflammatory diseases such as sepsis and haemolytic diseases. In particular, I focus on platelet ITAM receptors CLEC-2 and GPVI in the regulation of both inflammation and thrombosis and their potential as a drug target in these diseases. I am also interested in the role of platelets in wound repair and the maintenance of vascular integrity during inflammation. I use in vitro, ex vivo, intravital microscopy, light sheet microscopy and in vivo models to investigate the interaction of platelets with innate immune cells and to determine key interactions that regulate the functions of both cells."

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Congratulations

Davide Calebiro has been awarded the 2020 European Journal of Endocrinology Award. This an annual award presented to a scientist who has contributed significantly to the advancement of knowledge in the field of endocrinology through publication.

Meri Canals has been awarded an Academy of Medical Sciences Professorship. This is a five year award offered from the AMS aimed at supporting biomedical and healthcare researchers taking up their first full Professorship.

Steve Hill has been awarded the 2019 Ariëns Award by the board of the Dutch Pharmacological Society, the award is in memory of Professor E.J. Ariëns (1918 – 2002) and given annually as a recognition of outstanding scientific achievements in pharmacology.

Paula Mendes was awarded the Academic Award 2019 at the Midlands Women in Tech Awards. The Midlands Women in Tech Awards are a unique opportunity to highlight and recognise the ongoing contribution of women in the tech sector.

Jeanette Woolard has been successful in the application for The Wellcome Trust Doctoral Training Programme in "Drug Discovery and Team Science". The programme will last for 96 months, taking in four cohorts of PhD students. The first intake will be next year.

Key Dates

Team Science Seminar
31st October 2019 13:00
Alexander Kondrashov
"Modelling single nucleotide polymorphisms in cardiac-associated genes by CRISPR/Cas9 genome editing."

Lattice Light Sheet Discussion Group
13th November 2019 11:00-15:00
COMPARE Medical School
University of Birmingham
Contact: Dee Kavanagh

External Conferences

ELRIG Drug Discovery 2019
5th-6th November, Liverpool
https://elrig.org/portfolio/2019-drug-discovery/

QBI 2020 Conference 2020
6-9th January 2020
University of Oxford
https://www.quantitativebioimaging.com/qbi2020/

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If you have any items for the next newsletter please send to:

compare@birmingham-nottingham.ac.uk

Microscopes—Huygens Professional: Software Update—University of Birmingham

Huygens Professional is an image processing software package, part of the Huygens Software, tailored for doing Deconvolution of microscopic images. With Huygens Professional you can restore images without being a specialist on image restoration and optical theory. Intelligent tools make it possible for you to obtain the instrumental Point Spread Function (PSF) of your microscope from an easily recorded latex bead image. Allowing you to make sure that your microscope is functioning optimally and ensures optimal restoration results. Our Huygens installation includes modules for theoretical widefield and confocal PSF generation which removes the need for measured PSFs when performing routine microscopy.

Team Science Collaboration Grants—Leigh Stoddart—Calebiro Lab

Single molecule tracking microscopy to investigate the effect of agonist treatment on diffusion of the adenosine A3 receptor

At University of Nottingham we have been working on advanced imaging techniques (FCS and FRAP) to monitor the diffusion and organisation of the adenosine A3 receptor (A3R). The single molecule tracking microscopy technique which the Calebiro lab at the University of Birmingham are expert in, allowed us to monitor changes in the diffusion of the receptor over a whole cell. The data I generated with the expert help of Zsombor Koszegi and Jak Grimes has complemented our existing data and indicated that the diffusion of the A3R only subtly changes upon agonist treatment. The help of the grant enables this exchange to happen more organically and productively than via email or at a meeting.

The encouraging data generated as part of this project strengthens my current project and should lead to a higher impact publication. In addition, we are in discussion to work collaboratively with the Calebiro lab on another project.

This partner lab project allowed me to gain experience in an additional microscopy technique which is complementary to my existing skills. Working collaboratively with another group has strengthened my project on the organisation and diffusion of the A3R and will be useful in my future career as it extends my potential network of collaborators.

Conference Report—25th International workshop on Single Molecule Spectroscopy and Super-resolution Microscopy in the Life Sciences, Berlin—Joëlle Goulding

The conference was held over four days and a myriad of techniques were discussed including AFM, FLIM, FCS, FRET, STORM, PALM and we were introduced to new acronyms; MINFLUX, SIMPLE, MIET and SPRAIPAINT! Importantly for me I was able to forward my education around STED (Stimulated Emission Depletion Microscopy) and FLIM (Fluorescence Lifetime Imaging), techniques we shall soon be employing in house within COMPARE at the University of Nottingham.

Of particular note were two of the Keynote addresses which were given by Stefan Hell and W.E. Moerner who, alongside Eric Betzig, were awarded the 2014 Nobel Prize in Chemistry for their work on the development of super-resolution microscopy techniques.

My own abstract had been accepted for a poster presentation and selected for a flash presentation on the first day. I had 4 minutes to address the workshop and hopefully encourage them to come discuss my poster that evening. I had been developing single point FCS (fluorescence correlation spectroscopy) techniques to measure membrane receptor expression and diffusion on human stem cell derived cardiomyocytes in both an overexpressed SNAP-tagged system and a system expressing at endogenous levels. Whilst FCS is an excellent technique for exploring receptor organisation at very low expression levels as observed physiologically, primary cell lines are microscopically difficult samples to work with. Through the use of a novel fluorescent ligand developed at the University of Nottingham I had been developing a workflow to allow these studies which could allow exploration of the pharmacology of clinically relevant receptors within human cells via single cell microscopy.

I would like to thank the Royal Microscopical Society, the University of Nottingham's Graduate School and COMPARE for the funding which allowed me to attend this event.