COMPARE
CENTRE OF MEMBRANE PROTEINS AND RECEPTORS

Newsletter
Edition 23 February 2020

Congratulations

Congratulations to Dr Iain Styles, Deputy Director of COMPARE, who will be taking up a dual role of Turing University Lead and Director of the Institute for Interdisciplinary Data Science at the University of Birmingham.

Sandpit—11th March 2020

The next COMPARE Sandpit will be on **Machine Learning and Computational Modelling**, on 11th March 2020 from 14:00 –17:00 at the University of Birmingham Medical School, room WF38.

Confirmed talks and speakers include:

- Eva Frickel (UoB)
  Defining host–pathogen interactions employing an artificial intelligence workflow
- Jeremy Pike (UoB)
  CARE: Content aware image restoration
- Dylan Owen (UoB)
  Machine-learning based cluster analysis of SMLM point patterns
- Giovanni Bottegoni (UoB)
- Mireia Jimenez-Roses (UoN)
- Yann Lanoiselee (UoB)
  Detection of transient caging from single particle trajectories
- Charles Laughton (UoN)

There will be plenty of time for questions and discussion, refreshments will be provided.

Symposium—ECR focussed symposium on GPCRs 22nd April 2020

COMPARE are delighted to be holding a satellite symposium on **Wednesday 22nd April** at the University of Nottingham, which is focussed on G protein-coupled receptor (GPCR) pharmacology and cell signalling. We have an exciting programme of early-career researchers from prestigious institutions, including University of Cambridge, University of Leipzig, and VU Amsterdam.

This event is to celebrate the involvement of early-career researchers in the field and is free to attend.

Lunch and refreshments will be provided. The day will commence at 10:00 and conclude by 16:30. Detailed schedule to follow. There will be a poster session following lunch. If you would like to display your poster during this session, please email your poster title to Mark (mark.soave@nottingham.ac.uk) or Laura (laura.kilpatrick@nottingham.ac.uk) in addition to filling in the details on the registration form.

Register on Eventbrite: https://www.eventbrite.com/e/compare-ecr-gpcr-symposium-tickets-91109660447

Key Dates

Sandpit—Computational/AI/ Machine Learning
Wednesday 11th March 2020
WF38 Medical School
University of Birmingham

GPCR Focussed Symposium
Wednesday 22nd April 2020
Coates Road Auditorium
University of Nottingham

COMPARE Annual Research Symposium
24th September 2020
Edgbaston Park Hotel
Birmingham

birmingham-nottingham.ac.uk/compare

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

compare@birmingham-nottingham.ac.uk

IN PARTNERSHIP:
The Universities of Birmingham and Nottingham

Clinical Research Fellows

The following have been appointed as COMPARE Research Fellows in Nottingham

Alexander Kondrashov (supervisor Chris Denning)

Project summary; Over the last few years, significant progress has been made in the development of potent anti -cancer drugs therapies. However, approximately 10 % of the patients subjected to anti-cancer drugs develop adverse side effects including damage to their heart.

The β2 adrenoceptor resides in the membrane of cardiac cells and is known to be a "protector" against heart failure. Since the genetic background of all humans is different, the sequence of the β2 adrenoceptor is also variable between individuals. At least four variants of the receptor can be found among humans. It has been shown that this variability may have a crucial impact on the development of heart failure. However, due to difficulties in design of appropriate model systems, no studies have been performed to understand the involvement of this genetic variation in cardiotoxicity.

Using our unique cellular models developed with cutting edge gene manipulation technologies, we propose to uncover the molecular mechanisms behind cardiotoxicity induced by anti-cancer drug treatment.

Anna Malecka (Supervisor Hester Franks)

Project Summary; Tumours need blood vessels to obtain nutrients in order to grow. They also use blood vessels to spread to other parts of the body. One of the chemical signals that tumour cells use to stimulate new blood vessel development (cancer angiogenesis) is Vascular Endothelial Growth Factor-A (VEGFA), which binds to the VEGF receptor 2 (VEGFR2) on endothelial cells. As a consequence, VEGFA-VEGFR2 interactions are of great interest in the treatment of cancer.

Many drugs have been developed to stop new blood vessel growth, but they often do not work particularly well in cancer patients. This is likely to be because of the complex cellular environment that exists in the patient. In a tumour, there are many different types of cell which interact with each other. A drug which stops blood vessel growth in a simple laboratory experiment may not work in a complex cellular environment. Fibroblasts and macrophages are the most numerous cells in a tumour. They are often situated in close proximity to each other and also blood vessels. This project aims to understand how macrophages and fibroblasts alter the response of blood vessel cells to VEGFA.

Congratulations

Caroline Kardeby a postdoc in the Platelet lab at the University of Birmingham. Caroline has been awarded a Marie Skłodowska-Curie Actions Individual Fellowship. The PAELLA project will run for 2 years and involve research on Platelet Endothelial Aggregation Receptor 1, including visits to labs in France (Inserm, Toulouse) and Spain (Santiago de Compostela) to build Caroline's international network and profile.

COMPARE Publications

Griffié J, Peters R, Owen DM, (2020). An agent-based model of molecular aggregation at the cell membrane. PLoS One. doi: 10.1371/journal.pone.0226825

Nasteska D, Hodson DJ, (2020). GPR119 Agonism Revisited: A Novel Target for Increasing β-Cell Mass? Endocrinology. doi: 10.1210/endocr/bqz018.

White CW, Caspar B, Vanyai HK, Pfleger KDG, Hill SJ, (2020). CRISPR-Mediated Protein Tagging with Nanoluciferase to Investigate Native Chemokine Receptor Function and Conformational Changes. Cell Chem Biol. doi: 10.1016/j.chembiol.2020.01.010. [Epub ahead of print]