

# COMPARE

CENTRE OF MEMBRANE PROTEINS AND RECEPTORS

## Newsletter

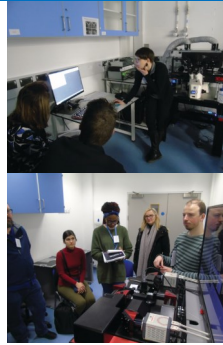
Edition 6, April 2018

### Grants

A joint BHF infrastructure grant to support cardiovascular research in COMPARE has been awarded by the BHF. This will include a state of the art FCS/STED in Nottingham and a SIM and light-sheet ultramicroscope for cleared tissue in Birmingham.

### Light-sheet workshop

The COMPARE inaugural workshop on light-sheet microscopy was held on the 26<sup>th</sup> and 27<sup>th</sup> February at The University of Birmingham with Dr Steve Thomas, Technology Lead of COMPARE, opening the event. The sell-out workshop attracted delegates from eleven different countries, and speakers including Ferenc Mueller, Charlotte Buckley, Gopi Shah, Johannes Stegmaier, Jochen Gehrig, Rob Wilkinson, Vikas Trivedi, René Hägerling and Ebba Brakenhielm. In addition, day one included industry techno-bite sessions from 3i, Zeiss, Luxendo Bruker, Labtech, LaVision, Cairn, and Acquirer, which provided delegates with the opportunity to catch up on latest company advancements in light-sheet microscopy. The day ended with a reception, serving as an excellent forum for further discussion with the speakers and company specialists. The event continued into day two with four interactive workshops (3i Marianas light-sheet, Zeiss Z1, Luxendo Bruker MuVi and Labtech X-Clarity). The application specialists covered every detail of light-sheet microscopy and tissue clearing from sample preparation, technique development and application through to image reconstruction and analysis. The COMPARE workshop on light-sheet microscopy was only made possible through the generous support of its sponsors and industry partners.



### Key Dates

#### COMPARE Launch

Keynote: Brian Kobilka

Nobel Prize Laureate

LT1 Medical School,

Nottingham

18th April 2018 16:00

[https://](https://comparelaunch.eventbrite.com)

[comparelaunch.eventbrite.com](https://comparelaunch.eventbrite.com)

#### COMPARE Team Science and

ONCORNET Research

Symposium

LT4 Medical School, Nottingham

18th April 2018 09:30

[https://compare-](https://compare-oncornet.eventbrite.com)

[oncornet.eventbrite.com](https://compare-oncornet.eventbrite.com)

#### Team Science Away Day

Fazeley Studios

Birmingham

18th May 2018

[https://www.eventbrite.com/e/](https://www.eventbrite.com/e/compare-team-science-away-day-tickets-44099152753)

[compare-team-science-away-](https://www.eventbrite.com/e/compare-team-science-away-day-tickets-44099152753)

[day-tickets-44099152753](https://www.eventbrite.com/e/compare-team-science-away-day-tickets-44099152753)

#### Sandpit, Birmingham

26th October 2018 14:00

“Gene editing and stem cell

approaches in the study of

membrane proteins”

#### Annual Research Symposium

Birmingham Hotel & Conference

Centre

28th September 2018



[birmingham-](https://twitter.com/birmingham-nottingham.ac.uk/compare)

[nottingham.ac.uk/](https://twitter.com/birmingham-nottingham.ac.uk/compare)

[compare](https://twitter.com/birmingham-nottingham.ac.uk/compare)

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

[compare@birmingham-nottingham.ac.uk](mailto:compare@birmingham-nottingham.ac.uk)

### Seminars—21st March 2018

**Dmitry Veprintsev**, University of Nottingham, gave and live broadcast a seminar from the University of Birmingham entitled “The inner workings of a G protein-coupled receptor: molecular basis for biased signalling”.

**Malou Zuidschewoude** from University of Birmingham presented on light-sheet microscopy as the fourth Team Science Seminar. Her talk focussed on the technique as well as its applications in the characterisation of platelet biology.

### COMPARE Publications

#### Latest publications with COMPARE affiliation or by COMPARE PIs

Hollinshead, K.E.R., Munford, H., Eales, K., Bardella, C., Li, C., Escibano-Gonzalez, C., Nonnenmacher, Y., Thakker, A., Murren, R., Cuzzo, F., Ye, D., Laurenti, G., Zhu, W., Hiller, K., Hodson, D.J., Hua, W., Tomlinson, I., Ludwig, C., Mao, Y. and Tennant, D.A. (2018). Oncogenic IDH1 mutations promote enhanced proline synthesis through PYCR1 to support the maintenance of mitochondrial redox homeostasis. *Cell Rep.* Accepted.

Beazley-Long N, Moss CE, Ashby WR, Bestall SM, Almahasneh F, Durrant AM, Benest AV, Blackley Z, Ballmer-Hofer K, Hirashima M, Hulse RP, Bates DO, Donaldson LF, (2018). VEGFR2 promotes central endothelial activation and the spread of pain in inflammatory arthritis. *Brain, Behav & Imm* (online).

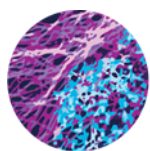
**We would like to celebrate our successful publications via the newsletter and the COMPARE website. Please email [compare@birmingham-nottingham.ac.uk](mailto:compare@birmingham-nottingham.ac.uk) with the references of published papers.**

### COMPARE Vacancies

COMING SOON—Birmingham Chair and Research Fellow—details of these two vacancies will be advertised shortly.

### IN PARTNERSHIP:

The Universities of Birmingham and Nottingham



# COMPARE

CENTRE OF MEMBRANE PROTEINS AND RECEPTORS

## Dual Inverted Selective Plane Illumination Microscopy (diSPIM)

The 3i Marianas diSPIM with custom-built OKO environmental chamber is available at The University of Birmingham site, for all enquiries please contact Dee Kavanagh, [D.M.Kavanagh@bham.ac.uk](mailto:D.M.Kavanagh@bham.ac.uk).

Conventional imaging methods such as widefield and confocal microscopies use an illumination configuration that exposes the entire sample to light. In live cell imaging, this whole cell illumination strategy can be detrimental to the physiological state of the specimen. Light-sheet microscopy (LSM) or selective plane illumination microscopy (SPIM) allows non-destructive imaging of living samples by confining the excitation light to the detection plane only.

The diSPIM is a dual inverted light-sheet microscope developed by Hari Shroff and team at NIH [1]. In contrast to other SPIM techniques, the diSPIM acquires two perpendicular views of a sample by alternating orthogonal objectives for excitation and detection. This results in the acquisition of two 3D datasets, which are computationally merged and deconvolved, generating a single volume with isotropic spatial resolution. Image stacks are acquired by sweeping the light-sheet through the sample, while a piezo keeps the detection objective focused on the light-sheet. Samples can be prepared using conventional glass coverslips or mounted in agarose. The diSPIM can be used to image cells, cleared tissues and small organisms such as nematode, zebrafish and fruit fly. In imaging applications where environmental control is critical, the diSPIM is custom fitted with an OKO environmental chamber allowing precise control of temperature, humidity and CO<sub>2</sub>. In combination, samples can be imaged over the course of hours to days.

<sup>1</sup>Wu et al. Spatially isotropic four-dimensional imaging with dual-view plane illumination microscopy. *Nature Biotechnology* (2013).

## Welcome

**Jackie Glenn** joined the COMPARE Team as a Research Technician in November 2017 and will be working in the labs in Nottingham alongside Dr Laura Kilpatrick and Steve Hill. Jackie has a background in platelet research but has worked for the university in Cell Signalling for the past four years. Originally collaborating on a project involving the P2Y<sub>2</sub> receptor, Jackie is currently providing technical support for studies of the EGF receptor.  
[Jackie.glenn@nottingham.ac.uk](mailto:Jackie.glenn@nottingham.ac.uk), 0115 82 31012



**David Sykes** has over 20+ years of experience working in a drug discovery environment mainly in a specialist assay development role and most recently with Novartis. In 2014, David joined the University of Nottingham and began a part-time PhD in Molecular Pharmacology and Drug Discovery. David is currently employed as a Senior Experimental Officer having recently taken up a new position at the university in November working in the Molecular and Cellular Pharmacology group led by Prof Dmitry Veprintsev. His current interests include the development of HTS fluorescence-based kinetic binding assays specifically designed to assess the kinetics of unlabelled compounds (and chemical fragments) and the use of purified receptor/ effector proteins as tools for drug discovery.  
[David.sykes@nottingham.ac.uk](mailto:David.sykes@nottingham.ac.uk), 0115 82 30458



## Team Science Away Day—18th May 2018

On **Friday 18th May** the COMPARE Team Science Committee are hosting an Away Day for COMPARE PhD students, technicians and early career researchers. The event is being held at the Old Ikon Gallery, Fazeley Studios, 191 Fazeley Street, Digbeth, Birmingham D5 5SE. The general theme for the Away Day is being split between forging collaborations between COMPARE members, and a discussion on authorship driven by a panel of invited speakers, including Prof Jason Swedlow (University of Dundee). For more details and registration; <https://www.eventbrite.com/e/compare-team-science-away-day-tickets-44099152753>

## Team Science—Summer Placements

The following Researchers have been awarded funding for the six week summer placements.

| Supervisor     | Student       | PI           | Project Title  |
|----------------|---------------|--------------|--|
| Alex Slater    | Hanh Nguyen   | S Watson     | Studying the interaction of platelet receptor GPVI with its major ligands collagen and fibrin        |
| Mark Soave     | Zarah Tabrizi | S Hill       | Using NanoBRET to investigate ligand binding of VCP746 at the rat adenosine A <sub>2B</sub> receptor |
| Leigh Stoddart | Julija Sirina | S Hill       | Characterization of adenosine A <sub>3</sub> receptor selective fluorescent agonists                 |
| David Sykes    | David Tippet  | D Veprintsev | Development of cannabinoid CB <sub>2</sub> receptor specific HTRF and BRET-based binding assays      |

## IN PARTNERSHIP:

The Universities of Birmingham and Nottingham