

## Advances in photonic tools and techniques for the life sciences: **TECHNOLOGY INTEGRATION ENABLING IMAGING OVER MANY SCALES: FROM MOLECULES TO MAN**

**Date:** Wednesday 4th June 2014

**Venue:** James Watt Centre II, Edinburgh Conference Centre, Heriot-Watt University

### PROGRAMME

**10.00 Introduction and welcome**

Prof Rory Duncan, Heriot-Watt University, Institute of Biological Chemistry, Biophysics and Bioengineering, on behalf of the programme committee.

**Session 1: Enabling technologies for advanced imaging**

Chair: Gail McConnell

**10.05 New directions in imaging and manipulation with shaped light.**

Prof Kishan Dholakia, Optical Trapping Group, University of St. Andrews

**10.30 Progress in CMOS single photon sensors for the Life Sciences.**

Dr Robert Henderson, School of Engineering, University of Edinburgh

**10.55 Fast fluorescence lifetime imaging techniques for solid-state single-photon imagers**

Dr David Li, Department of Electronic and Electrical Engineering, University of Strathclyde

11.20 Refreshment break in exhibition hall

**Session 2: Advances in biological imaging**

Chair: Rory Duncan

**12.00 The application of super-resolution microscopy to observe single molecule organisation and dynamics**

Dr Colin Rickman, Heriot-Watt university, Institute of Biological Chemistry, Biophysics and Bioengineering

**12.25 4D microscopy of morphogenesis in Drosophila.**

Dr Marcus Bischoff, School of Biology, University of St. Andrews

**12.50 Optical traps for single-cell tomography**

Prof. Dr. Graeme Whyte, Engineering Advanced Materials, University of Erlangen-Nürnberg (FAU), Germany.

13.15 Lunch break: opportunity to review the exhibition

**14.15 Poster Session** in the Exhibition Hall

Refreshments will be served before reconvening for the afternoon session

**1. Real-time label-free imaging of tissue growth and viability in 3D tissue engineering scaffolds via optical coherence phase microscopy (OCPM)**

Dr. Pierre Bagnaninchi, Biomedical Engineering Research Fellow, University of Edinburgh

**2. Laser diagnostics of cerebral micro-heamodynamics: bifurcation point in blood oscillatory rhythms for patients with ischemic stroke. Nonlinear dynamics.**

Dr Alexey Goltsov, School of Science Engineering & Technology, Abertay University

**3. Lamin A level dependent cell mechanics investigated with an optical cell-stretcher**

Thorsten Kolb, Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU)

**4. Mapping Redox Potential in 3D Breast Cancer Tumour Models**

Lauren Jamieson, University of Edinburgh

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### PROGRAMME (Continued)

**5. Fluorescence lifetime cross-correlation microscopy resolves functional TCR-CD8 complexes on the surface of live antigen experienced T cells**

Dmitry M Gakamsky, Institute of Biological Chemistry, Biophysics & Bioengineering, School of Engineering & Physical Sciences, Heriot-Watt University

**6. Multispectral snapshot imaging applied to oximetry using IRIS**

Javier Fernandez Ramos, University of Glasgow

**7. Double Tunnel Junction Mode-Locked Laser Diode for Potential Bioimaging Applications**

Adam Forrest, The University of Dundee

#### Session 3: Ex vivo and in vivo imaging advances

Chair: Colin Rickman

15.10 **Detecting extra cellular matrix modification *via* multiphoton microscopy.**

Dr Ewan McGhee, Beatson Institute for Cancer Research, Glasgow

15.35 **Combined multi-modal CARS/two-photon microscopy for deep in vivo imaging of the tumour microenvironment.**

Dr Alan Serrels, Edinburgh Cancer Research Centre University of Edinburgh

16.00 **Towards in vivo optical imaging in man.**

Prof Mark Bradley, School of Chemistry University of Edinburgh

16.25 Closing remarks by Prof Rory Duncan

16.30 End of meeting

The exhibition remains open until 5pm

#### PROGRAMME COMMITTEE

**Prof Rory Duncan,**

Heriot-Watt University, Institute of Biological Chemistry, Biophysics and Bioengineering.

**Prof Gail McConnell,**

Chair of Biophotonics at the Strathclyde Institute of Pharmacy and Biomedical Sciences, University of Strathclyde

**Prof Kishan Dholakia,** School of Physics & Astronomy, University of St Andrews.

**Dr Colin Rickman,**

Heriot-Watt University, Institute of Biological Chemistry, Biophysics and Bioengineering

#### CONSULTANT

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Photonics, Department of Physics and the Division of Experimental Medicine in the Department of Medicine, Imperial College London.