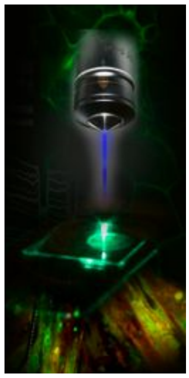
1st Advanced Bio-Imaging Workshop at Hawkesbury, University of Western Sydney

Monday 8th to Friday 12th September, 2008

This workshop is for advanced bio-imaging researchers. Learn how to track molecular processes *in vivo*, measure protein-protein interactions and spatial / temporal fluctuations, relevant to cellular and subcellular aspects of cell biology, cancer and other diseases.

The workshop will be at the CBIF - a new multi-user facility with state-of-the-art confocal and microanalytical instruments.



Location: Confocal Bio-Imaging Facility (**CBIF**), Building S8, School of Natural Sciences, Hawkesbury Campus, UWS.

Registration & Public Forum: 10:30–13:40 8th Sept at G1; Lectures: 9:30 – 13:00 at R5; Hands-on sessions: 14:00–17:00 at S8.

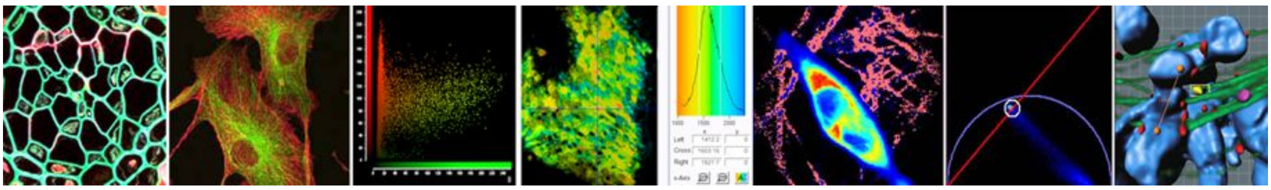
Map Hawkesbury campus *http://www.uws.edu.au/campuses_structure/cas/campuses/hawkesbury*

Programme overview:
09:30-13:00 Presentations by international & key researchers from the Australian imaging community. **14:00-17:00** Hands-on training & experimental sessions. Participants will be able to trial advanced techniques on their own samples. **Funding from FABLS available for student scholarships & early career researchers** *http://www.uws.edu.au/health_science/chs/facilities*

Invited speakers (see program for full list)

Prof. Enrico Gratton, Laboratory for Fluorescence Dynamics, Univ. California, Irvine
Prof. Robert Hoffman, University of California / AntiCancer Inc, San Diego
Dr Michelle Digman, Optical Biology Core Facility, University of California, Irvine
Guy Cox, EMU, University of Sydney
Louise Cole, Bosch Institute, University of Sydney
Ian Harper, Micro Imaging, Monash University
Stephen Firth, Micro Imaging, Monash University
Andrew Clayton, Ludwig Inst. of Cancer Research
Stephen Cody, Ludwig Institute of Cancer Research
David Williams, University of Melbourne

PROGRAM - Lectures, hands-on demonstrations, experiments, data analysis



- Advanced live cell labeling technologies
- Cancer imaging in live animals & cells
- *In vivo* imaging of molecular & protein dynamics
- Photoactive GFP-type proteins as cell labels
- FRET and FRAP techniques and analysis
- Calcium and other ion imaging in live cells
- Confocal micro-spectral imaging
- Multi-Photon Microscopy
- Elemental mapping of cells

- Fluorescence Lifetime Imaging Microscopy (FLIM) & Phasor Approach to FLIM
- Number and molecular brightness (N&B) analysis for cellular protein concentrations & aggregation mapping
- Fluorescence and raster image correlation spectroscopic (FCS & RICS) imaging
- Advanced image analysis & 3D software
- Confocal Raman spectral imaging

Sponsoring organizations and instrument support

Time-table The workshop will commence with a public forum at 12:00-14:20, 8th September (**location lecture theater G1**) inviting UWS staff and students, high schools and the general public. Workshop registration on 8th Sept. will be at G1; on all other dates at **R6**

8th Sept, Monday

10:00-12:00	Registration & tea & coffee at G1
12:00-12:20	Opening address - Public Forum
12:20-13:00	Public lecture: Imaging molecules at work in live cells. Prof. E. Gratton, Lab. for Fluorescence Dynamics, University of California, Irvine
13:00-13:40	Public lecture: Fluorescent proteins for *in vivo* imaging of cancer and for anticancer drug discovery. Prof. Robert Hoffman, University of California / AntiCancer Inc, San Diego
13:40-14:40	**Lunch & viewing of CBIF displays**
14:40-15:00	Effective cancer treatment using tumor-targeting bacteria. Prof R. Hoffman, Uni. Calif. / AntiCancer Inc
15:00-15:35	Fluorophores & labelling procedures for biological imaging. I. Harper, Monash Micro Imaging, Monash Univ.
15:35-16:00	Next generation cell imaging. L. Vo, Invitrogen.
16:05-16:40	Confocal and multiphoton principles – applied aberrations. S. Cody, Ludwig Cancer Research Institute
16:40-17:00	Introduction to components of a confocal system. S. Cody, Ludwig Cancer Research Institute
17:00-19:00	**Orchard Function / Mixer at S9**

9th Sept, Tuesday

09:30-09:50	Keeping cells alive during imaging. S. Cody, Ludwig Cancer Institute
09:50-10:20	Motional dynamics in cells measured using FRAP. A. Clayton, Ludwig Cancer Research Institute
10:20-10:40	Second generation GFPs: application of photoactive GFP-type proteins from corals in bio-imaging. A. Salih, Univ. Western Sydney
10:40-11:00	Spectral imaging using confocal & multiphoton microscopy. C. Thoni, Leica Microsystems
11:00-11:30	**tea**
11:30-12:00	Sub-cellular imaging techniques to study cancer & tumor-host interactions. Prof. R. Hoffman, Uni. Calif. / AntiCancer
12:00-12:30	Measuring molecular conformation & association in cells by FRET microscopy. A. Clayton, Ludwig Cancer Research Institute
12:30-13:00	Approaches to measuring fluorescence lifetime microscopy (FLIM). G.Cox, University of Sydney
13:00-14:00	**Lunch**
14:00-17:30	**Hands-on sessions**

Cell labeling, spectral imaging, FRAP, GFPs & Photoactive GFP-type proteins, FLIM, bio-imaging instrument sessions, 3D software

Abbreviations: B&H - Number & molecular brightness
ICS – Image correlation spectroscopy
FCS - Fluorescence correlation spectroscopy
FLIM - Fluorescence lifetime imaging microscopy
FRAP - Fluorescence recovery after photobleaching
FRET - Forster resonance energy transfer
RICS - Raster image correlation spectroscopy

10th Sept, Wednesday

09:30-10:00	Optimising imaging conditions for fluorescence & confocal microscopy. S. Firth. Monash Micro Imaging, Monash Univ.
10:00-10:30	Introduction to advanced FCS. Prof E. Gratton, University California
10:30-11:00	Confocal endomicroscopy in medicine. P. Delaney *et al.*, OptiScan
11:00-11:30	**Morning tea**
11:30-12:00	Spatio-temporal FCS. Prof. Enrico Gratton
12:00-12:30	Introduction to ICS. M. Digman, Univ. Calif.
12:30-13:00	Advanced imaging in plant & medical sciences. L. Cole Bosch Inst., Univ. Syd.
13:00-14:00	**Lunch**
14:00-17:00	**Hands-on sessions**

Optimizing imaging, Ca^{+2} imaging, GFPs in plants & photoactive GFPs, FRET, FCS, 3D software; bio-imaging instrument sessions

11th Sept, Thursday

09:30-10:00	Probes and probing - approaches to measurement of physiological ions. Prof. D. Williams, Univ. Melbourne
10:00-10:30	Introduction to RICS. M. Digman, University of California
10:30-11:00	High Speed Imaging in live cell confocal systems, C. Johnson, PerkinElmer Life Sci
11:00-11:30	**Morning tea**
11:30-12:00	Introduction to N&B method. M. Digman, University of California
12:00-12:20	FRETting with Meta. O. Gervasio, School of Medical Sci., Univ Sydney
12:20-12:40	Applications of infra red fluorescence in *in-vivo* imaging. J. Imgrund, Millennium Sci.
12:40-13:00	Imaris: 3D/4D real-time interactive visualization & analysis. L. Mortuno, SciTech
13:00-13:40	**Lunch**
13:40-17:00	**Hands-on sessions**

RICS, N&B, ratiometric ion imaging, Raman imaging, personal samples, 3D software, instrument sessions

18:00-22:30	**Workshop dinner at Loxley Resort**

12th Sept, Friday

09:30-10:00	Phasor FLIM & FRET. Prof Enrico Gratton
10:00-10:15	Live cell imaging in flow in cytometry & plate based analysis. W. Bach, Millennium Sci
10:15-10:30	Imaging, elemental mapping by laser ablation & mass spectroscopy. R. Thomas, UWS
10:30-11:00	STED microscopy - sub-diffraction imaging of the enigmatic protein Fts-Z in *Bacillus subtilis*. P. Peters, G. Cox & L. Harry. UTS & Univ Syd
11:00-11:30	**Morning tea**
11:30-12:00	*In vivo* particle tracking, Prof E. Gratton, University of California
12:00-12:20	Human neuronal stem cells: tissue culture & imaging techniques. Dr M. Wayne, School Medical Science, Uni. Sydney
12:20-12:40	The Nikon A1 high speed confocal imaging. S. Tran, Coherent Scientific
12:40 - 13:00	FLIM imaging: Title to be confirmed
13:00-14:00	**Lunch**
14:00-17:30	**Hands-on sessions**

FLIM & Phasor FLIM & FRET, N&B, RICS, Laser ablation & elemental mapping; 3D software

17:30-19:00	**Closing speech and drinks**

REGISTRATION - Registration (at 09:00-09:30 at G1/R5) for all lectures (09:30 – 13:00, daily; for 8th Sept, see program) is unlimited in registrant numbers; for hands-on sessions (14:00-17:00, daily) limited to 30 participants, depending on the availability of instruments.

Five day registration	**One day registration**
lectures + hands-on sessions	**lectures + hands-on sessions**
Full rate $495	not available
Student rate $250	
Five day registration lectures only	**One day registration lectures**
Full rate $320	Full rate $160
Student rate $180	Student rate $ 40
Workshop dinner $ 60	Costs include GST

Please, email Anya Salih a.salih@uws.edu.au to reserve your place at the workshop. Please note, workshop hands-on sessions are limited in numbers and if you intend to participate, please email Anya and register as soon as possible. Registration forms and relevant information are available at http://www.uws.edu.au/health_science/chs/facilities

MEALS - Morning and afternoon tea/coffee & lunch will be provided and included in registration fee. Other meals can be purchased at the cafeteria or at near-by restaurants. There will be a workshop mixer (Orchard drinks and nibbles) at 16:30-19:00 on 8 th Sept. (included in the registration fee) and a post-workshop dinner at Loxley resort on 11th Sept. ($60.00).

SCHOLARSHIPS The ARC/NHMRC Network "Fluorescence Applications in Biotechnology and Life Sciences" (FABLS) is providing financial sponsorship to cover workshop expenses for several students ($500 - each, travel and registration coss) and early career researchers (ECR, $495 each, registration costs). Only full workshop registrants (attending both lectures & hands-on sessions) will be eligible http://www.uws.edu.au/health_science/chs/facilities

ACCOMMODATION - On-campus accommodation is available at the Hawkesbury College at 5 mins walking distance from the workshop venue. Rooms are single or double, with a shared bathroom at $44/day/person or ~$60 / day, respectively or ~$300 / week (student rates - http://residences.uws.edu.au/hawkesbury_accommodation.html). On-campus motel accommodation at ~$89.50 per day single / person is at 5-10 min walking distance from the venue. Rooms have a kitchenette, private bathroom and a TV. There are also a number of Bed & Breakfast accommodation options in the area. Rooms can be booked as part of registration.

TRAVEL - Daily pick-up shuttle for workshop participants will be available from the airport and from Sydney's Central Station. Hawkesbury campus of UWS is located 1.15 hours from Sydney's CBD by car or 1.40 hours by train (Richmond line). On-campus parking is available.

SOCIAL ACTIVITIES - Orchard workshop mixer (drinks and nibbles) at 17:00-19:30 on 8th Sept.; Hawkesbury sights and entertainment (location to be confirmed) at 18:00 - 21:30 on 9th Sept.; Loxley resort workshop dinner at 18:00-22:30 on 11th September

HAKESBURY REGION - The Hawkesbury campus of UWS is located in the beautiful Hawkesbury region, one of the earliest colonial settlements in Australia, settled in 1794. The atmosphere of the historic and picturesque towns of Windsor, Richmond, Kurrajong, Bilpin, Colo and Wiseman's Ferry, make a visit to this area an experience steeped in Australia heritage. There are numerous antique and craft stalls and boutique galleries to wander through. There is also a historic Winery, where visitors can try out the local wines, gourmet goats cheese or visit orchards and pick fresh fruit. The Hawkesbury river, one of the most beautiful in Australia, in many places is flanked by unspoiled woodland and bush. It is one of the few places on earth to be part of and be surrounded by 10 National Parks, e.g., the Wollemi and Blue Mountains National Parks. These offer opportunities for bushwalking, rock-climbing, cycling, canoeing, picnicking and bird watching. http://www.greaterbluemountainsdrive.com.au/hawkesbury-valley-surrounds.php ; http://www.hawkesburytourism.com.au/hawkesbury-national-parks.html; http://hawkesburyhighlands.com.au/about.htm; http://www.hawkesburytourism.com.au/hawkesbury-history.html

Workshop organizers: A Salih & M Jones
Organizing committee: A Salih, M. Jones, R. Thomas, M. Williams, T. Haigh

FOR FURTHER INFORMATION CONTACT *Dr. Anya Salih, a.salih@uws.edu.au, tel. +61 2 4570 1543; Dr. Mark Jones, m.r.jones@uws.edu.au, tel. +61 2 4570 1444*