Metabolic response of segmented prostate cancer cells after treatment, based on FLIRR (Fluorescence Lifetime Redox Ratio) –NAD(P)H-a2%/FAD-a1%. Scientific Reports | (2018) 8:79, DOI:10.1038/s41598-017-18634-x


Systems and live model cell line - transfected with above proteins will be available at workshop for the practical.

Faculty
Dr. A. Periasamy, University of Virginia
Workshop Director, ap3t@virginia.edu
Dr. M. Barroso, Albany Medical College
Dr. M. Börsch, Jena University, Germany
Dr. J. N. Demas, Chemistry, UVA
Dr. M. Digman, Univ. of California-Irvine
Dr. A. Kenworthy, MPBP, UVA
Dr. A. Rück, Universität Ulm, Germany
Dr. S. Vogel, NIAA, NIH
Dr. A. Walsh, Texas A & M University

Guest Lecturers
Dr. J. Zhang, Univ. of California, San Diego
Dr. K. Siller, Research Computing, UVA
Dr. P. So, MIT
Dr. M. Skala, Univ. of Wisconsin, Madison
Dr. M. Stanley, Chroma Tech.

For more info: https://kcci.virginia.edu/workshop/general-information

TUITION FEES:
$2,500 non-profit organizations
$2,900 for-profit organizations
(Includes lodging, breakfast, lunch, dinner, lecture materials)

Contact:
Prof. Ammasi Periasamy
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434-243-7602

Note: All participants must be fully Vaccinated and boosted.
AIM

The W.M. Keck Center for Cellular Imaging (KCCI), a university imaging center at the University of Virginia, is sponsoring an advanced practical course on (a) Förster (fluorescence) resonance energy transfer (FRET) for confocal and fluorescence lifetime imaging microscopy (FLIM-FRET); and (b) label-free FLIM microscopy of NAD(P)H and FAD to analyze the Redox metabolic states (FLIRR) in live cells before and after treatment.

Attendees are expected to be familiar with the basics of fluorescence microscopy. The curriculum, after a brief introduction to the principles of fluorescence, microscopy, fluorophores, FRET and FLIM, will concentrate on the practical aspects, hands-on individual instruction at the instruments followed by data analysis and interpretation.

Lectures and after dinner problem-solving discussions will address questions of fluorophore choices, the most suitable systems to achieve specific research objectives, qualitative vs. quantitative analysis and many more related subjects. Participants will also be introduced to a unique image processing and analysis software (PFRET) and Python code for FLIRR.

10+ different and advanced microscopy systems will be available for a maximum of 25 students. With internationally recognized faculty in attendance, there is ample opportunity to interact with experts formally or informally.

Live-cell specimens are provided. Participant’s own specimens are welcome.

PROGRAM SCHEDULE

March 6 Advanced Microscopy Techniques Lectures by leading scientists

March 4 – 8 Theory and Lab (Monday 10-6pm theory; other days Theory 8:30 AM – 12 PM)

- Introduction to workshop
- Basics of Fluorescence, FRET, FLIM, NADH, FAD, Trp, microscope choices
- Meet the experts from Abberior Case studies and Q&A on the subjects:
  - Confocal/spectral FRET
  - FLIM-FRET, NAD(P)H-TRP FRET
  - Fluorophore pairs for FRET/FLIM-FRET
  - FLIM-FRET,
  - Redox states analyzed by NAD(P)H & FAD
  - Metabolic Imaging
  - Imaging live/fixed cells & tissue
  - Spectroscopy FRET in suspensions
  - Bacterial FRET

March 5-8 Lab (1 PM – 5 PM)*

Hands-on practical instruction on various systems, data analysis, special demos, and general problem-solving discussions on

- Anisotropy / Homo-FRET
- NAD(P)H-TRP FRET
- FLIM analysis: Fitting and Phasor plots
- Single-molecule FRET
- Metabolic Imaging
- FRAP
- Working on your instrument of choice after formal curriculum ends

Instruments, Becker & Hickl, Boston Electronics, Carl Zeiss, Chroma Tech, ISS, Leica Microsystems, Olympus

*Including breakfast, breaks, lunch, and dinner.

Comparing uFRET (uncorrected for spectral bleed-through - SBT) with PFRET (Processed FRET, corrected for SBT). This PFRET correction software will be available for workshop participants.


Participating Instrument Companies

Becker & Hickl, Boston Electronics, Carl Zeiss, Chroma Tech, ISS Inc., Leica Microsystems, Olympus.