

International Workshop  
on  
***Principles and applications of Fluorescence Spectroscopy  
&  
Confocal Microscopy***

6<sup>th</sup> & 7<sup>th</sup> January 2020

**Foreign Faculty :** **Prof. Ammasi Periasamy,**  
Founder & Center Director  
W.M. Keck Center for Cellular Imaging  
University of Virginia, Charlottesville, USA

**Course Coordinators :** **Prof. S. Ganesan & Prof. P. Aruna**  
Department of Medical Physics,  
Anna University, Chennai-25

**Overview**

This workshop is intended for individuals wishing an in-depth introduction to principles of steady and time-resolved spectroscopy and its applications to Biology and life science. It also facilitates the enthusiastic participants to learn the practical usage of different types of confocal microscopy imaging methodologies, to study the morphology and cellular function in various biological systems from single molecule to single cell. The microscopy techniques provide spatial and temporal information of the cells or molecules. This is important because the cellular signal responses are heterogeneous distribution. The metabolic signals help to understand the cancer development, cancer progression and that leads to develop better drug to treat the cancer. Various microscopy techniques can be used to monitor the cellular response but fluorescence lifetime imaging technique has high sensitivity compared to any other microscopy techniques. The main focus of this course is to educate the participants on various aspects of fluorescence spectroscopy such as synchronous spectroscopy, excitation emission matrix, fluorescence polarisation, time-correlated single-photon counting spectroscopy and various types of confocal microscopy imaging of normal vs cancer cells and delineate the heterogeneous distribution of the cellular response using digital image analysis methods.

## **About The Course**

The main objective of the workshop are as follows:

- The lectures will deal with basics of steady-state and time-resolved fluorescence spectroscopy, instrumentation and data analysis. They cover time-domain and frequency-domain measurements, anisotropy, solvent effects, quenching and Förster Resonance Energy Transfer (FRET). Applications of time-resolved luminescence spectroscopy in biophysics and in the materials science will be discussed.
- Describe the various components involved in the microscopy imaging. Explain the basics of FLIM and FRET and its importance in normal and cancer cellular imaging.

## **Training on Instruments**

- Candidates will be given training on recording and analysis of Fluorescence excitation emission matrix, Synchronous luminescence spectrum, Polarised fluorescence, Time correlated single photon counting system and multiphoton confocal microscopy and Fluorescence Life time Imaging (FLIM)

## **Important dates**

- Final deadline for course registration: December 16, 2019
- Intimation of Registration : December 18, 2019

## **Registration Fee:**

Faculty/Industry experts : ₹2000/-

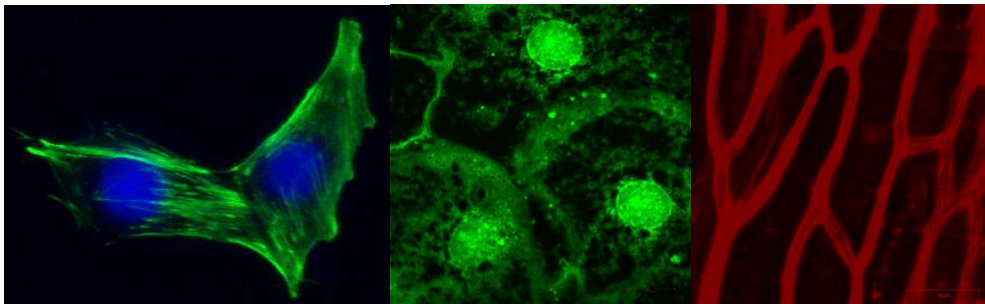
Research Scholars : ₹1500/-

- Registration fee has to be paid through Demand Draft drawn in favour of “The Director, Centre for International Relations” payable at Chennai.
- No TA/DA will be paid for the participants
- Registration fee is inclusive of Lunch, Tea and snacks
- Registration will be made on first come first serve basis
- Participants can bring their samples one or two if any for the study and analysis

## Foreign Faculty



**Prof. Periasamy** is an internationally recognized expert in advanced microscopy techniques, particularly in the area of molecular imaging in living cells, tissue and animal. A key area of his research is focused on the design and development of optical methodology including advanced light microscopy techniques to investigate/monitor exogenous and endogenous protein-protein interactions, intravital imaging and monitoring the physical parameters of normal versus cancer cells/tissues. He is the founder and center director of the internationally known W.M. Keck Center for Cellular Imaging (KCCI; <http://www.kcci.virginia.edu/>). Prof. Periasamy is one of the pioneers in the development of fluorescence lifetime imaging microscopy (FLIM). He developed a 2- and 3-color steady state, confocal, multiphoton, and FLIM based Förster resonance energy transfer (FRET) imaging system for protein localization in living specimens. He has published over 130 articles in refereed journals and book chapters. <http://kcci.virginia.edu/peri-publications>. He has given more than 150 invited lectures nationally and internationally. Prof. Periasamy has edited three books, series book editor on cellular and clinical imaging.



**MG-63 Cell lines**

**3T3 fibroblast cell**

**Onion peel**

## Co-Ordinators



**Prof.S.Ganesan** is the Professor of Medical Physics in Department of Medical Physics, Anna University Chennai. He also served as the Visiting Scientist W.M.Keck Centre for Cellular Imaging at Virginia USA. He is the recipient of prestigious BOYSCAST award by DST during 1994. He has more than 100 international publications in reputed journals and he has guided 35 research students. His area of Research Interest is Biophotonics, Radiation Dosimetry and other allied Sciences



**Prof. P. Aruna** is the Professor and Head, Department of Medical Physics, Anna University, Chennai. She has received Ph.D degree from Anna University in 1991. She is the recipient of the prestigious BOYSCAST award from DST in 1998. She has guided 11 doctoral candidates and 150 post graduate projects of MDS, M.Tech, M.Phil&M.Sc students in the field of Mediphotonics. Her research interests include fluoroscopy and spectroscopy based techniques for cancer diagnosis. She has published more than 100 papers in national and international journals.

## Contact Details

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