

Brief Biosketch

A key area of my research is focused on the design and development of advanced light microscopy techniques to investigate/monitor exogenous and endogenous protein-protein interactions, in vivo imaging and monitoring the physical parameters of normal versus cancer tissues. We developed a 2-color/3-color steady state, confocal, multiphoton, and FLIM based Förster resonance energy transfer (FRET) imaging system for protein localization in living specimens. The important aspect of the FRET-work is the development of a PFRET software package for quantitative FRET data analysis to estimate the nanometer (1-10 nm) distance between the protein molecules in living/fixed cells and tissue for various light microscopy techniques for any combination of fluorophore pairs. This PFRET software is used nationally and internationally by the FRET microscopy users. Dr. Periasamy is an internationally recognized expert in advanced microscopy techniques, particularly in the area of molecular imaging in living cells and tissues. He is one of the pioneers in developing lifetime imaging microscopy for intracellular calcium measurement and later he developed the same methodology for protein-protein interactions and cancer diagnosis. He has published over 100 articles in refereed journals and book chapters. He has given over 100 invited lectures Nationally and internationally. Dr. Periasamy has edited three books, Chairperson (since 2001) in organizing an annual International conference on Multiphoton Microscopy in the Biomedical Sciences through SPIE and runs a hands on training annual workshop (since 2002) on FRET Microscopy at the University of Virginia, Charlottesville during March. Dr. Periasamy is one of the elected "Fellow" member of the SPIE Optical Society.

EDUCATION:

University of Madras, Tamil Nadu	B.S.	1972	Physics
Annamalai University, Tamil Nadu	M.S.	1974	Physics(Optics & Spectroscopy)
Indian Institute of Technology, Madras	M.S.	1980	Biomedical Engg.
Indian Institute of Technology, Madras	Ph.D.	1983	Biomedical Engg.
University of Washington, Seattle, WA	Postdoc	1984-1987	Bioengineering

EMPLOYMENT EXPERIENCE:

1998-present	Center Director, W.M. Keck Center for Cellular Imaging, University of Virginia, Gilmer Hall, Charlottesville, VA.
2001-present	Full Professor, Department of Biology, University of Virginia, Charlottesville,
1996-present	Associate Professor of research, Department of Biomedical Engineering, University of Virginia, Charlottesville, VA.
1996-2001	Associate Professor of research, Department of Biology, University of Virginia, Charlottesville, VA.
1996-1998	Director, Center for Cellular Imaging (CCI), University of Virginia, Charlottesville
1990-1996	Assistant Professor of research - Video Microscopy Facility, Department of Cell Biology and Anatomy, University of North Carolina at Chapel Hill, NC.

1988-1990	Research Scientist - Medical University of South Carolina, Department of Anatomy and Cell Biology, Charleston, SC.
1984-1988	Postdoctoral Fellow at Bioengineering Dept., University of Washington, Seattle, WA
1982-1984	Assistant Professor/Lecturer- Department of Physics, Anna University, Madras, India.

HONORS

“Fellow” Elected by SPIE (International Society for Optics and Photonics) on January 23, 2012. “In recognition of distinguished and valuable contributions to the field of optics and photonics”

Editorial Board Member

Journal of Biomedical Optics

Guest Editor

Special Issue on “Advanced Microscopy techniques in biological sciences” – Methods, 2013

Special issue on “FRET at 65: A Celebration of Förster” – Journal of Biomedical Optics, January 2012.

Special issue on “Visible Fluorescent Proteins” – Journal of Biomedical Optics, July 2008

Special Issue on Multiphoton Microscopy - Journal of Biomedical Optics, July 2003

International Conference Chair

Multiphoton Microscopy in the Biomedical Sciences, The International Society for Optical Engineering (SPIE), San Jose, CA. (2001-2009), San Francisco 2010-present
Confocal, multiphoton, and non-linear microscopic imaging, (SPIE and OSA - Europe), Munich, Germany (2007)

FLIM-FRET for Live Cell Imaging, High-Content Analysis conference organized by Cambridge Healthtech Institute, January 5-9, 2009, San Francisco; September 22-24, 2009, Boston.

PUBLICATIONS

Books

“FRET Microscopy: Critical Discussions on Image Acquisition and Analysis” Cambridge University Press, 2013. In Preparation.

“FLIM Microscopy in Biology and Medicine” CRC Press (Taylor & Francis Group), pages 407, 2010

“Molecular Imaging:FRET Microscopy and Spectroscopy” Oxford University Press, NY, pages 312, 2005.

“Methods in Cellular Imaging” Oxford University Press, NY, pages434, 2001.

(Abstracts are not included) (Total 142)

Selected papers

1. Demarco, I. A., Periasamy, A., Booker, C. F. and Day, R. N. (2006) Monitoring dynamic protein interactions with photo-quenching FRET. Nature Methods 3(7):519-524.

2. Wallrabe, H., Elangovan, M., Burchard, A., Periasamy, A. and Barroso, M. (2003) Confocal FRET microscopy to measure clustering of receptor-ligand complexes in endocytic membranes. *Biophysical J.* 85:559-571. PMID: PMC1303111.
3. Chen, Y. and Periasamy, A. (2004) Characterization of two-photon excitation fluorescence lifetime imaging microscopy for protein localization. *Microscopy Research and Techniques.* 63:72-80.
4. Wallrabe, H., and Periasamy, A. (2005) Imaging Protein molecules using FRET-FLIM microscopy. *Cur. Opinion Biotech.* 16:19-27.
5. Chen, Y., Elangovan, M. and Periasamy, A. (2005) FRET data Analysis-The algorithm. In: *Molecular Imaging:FRET Microscopy and Spectroscopy.* Eds. A. Periasamy and R. N. Day, Oxford University Press-New York. Chapter 7. 126-145.
6. Chen, Y. and Periasamy, A. (2006) Intensity range based quantitative FRET data analysis to localize the protein molecules in living cell nucleus. *J. Fluorescence.* 16:95-104.
7. Wallrabe, H., Bonamy, G., Periasamy, A. and Barroso, M. (2007) Receptor complexes co-transported via polarized endocytic pathways form clusters with distinct organizations. *Mol. Biol. Cell.* 18:2226-2243. PMID: PMC1877110.
8. Chen, Y. J.P. Mauldin, R.N. Day and Periasamy, A. (2007) Characterization of spectral FRET imaging microscopy for monitoring the nuclear protein interactions. *J Microscopy,* 228:139-152.
9. Day, R.N., Booker, C. and Periasamy, A. (2008) The Characterization of an improved donor fluorescent protein for Förster resonance energy transfer microscopy. *J. Biomed. Opt.* 13: 031203. PMID: PMC2483694.
10. Sun, Y. Booker, C.F., Kumari, S., Day, R.N., Davdison, M. and Periasamy, A. (2009) Characterization of an Orange Acceptor Fluorescent Protein for Sensitized Spectral FRET Microscopy using a White Light Laser. *J. Biomed. Opt.* 14(5), 054009 PMID: PMC2774974.
11. Periasamy, A., Wallrabe, H. and Barroso, M. (2009) Quantitation of protein-protein interactions: Confocal FRET Microscopy. *Meth. Cell Biol.* 89: 569-598.
12. Sun, Y., Wallrabe, H. Booker, C., Day, R.N. and Periasamy, A. (2010) Three-color spectral FRET microscopy localizes three interacting proteins in living cells. *Biophysical J.* 99: 1274-1283. PMID: 20713013, PMID: PMC2920763.
13. Sun, Y., Wallrabe, H., Seo, S.-A. and Periasamy, A. (2011) FRET Microscopy in 2010: The Legacy of Theodor Förster on the 100th Anniversary of his Birth. *ChemPhysChem,*12: 462-474. PMID: 21344587.
14. Sun, Y., Day, R.N. and Periasamy, A. (2011) Investigating protein-protein interactions in living cells using fluorescence lifetime imaging microscopy. *Nature Protocols* 6: 1324-1340. PMID: 21886099 [PubMed - in process], PMID: PMC3169422 [Available on 2012/3/1].
15. Jyothikumar, V., Sun, Y. and Periasamy, A. (2012) Monitoring changes in Endogenous fluorophores through quantitative FLIM imaging in live cells. *SPIE Proc.* 822: pp. 822644-(1-7).