

Aniruddha Ray
420 Westwood Plaza, 14-128B Engr. IV,
Los Angeles, CA 90095, USA
Phone: 310-206-2050 (office)
Email: rayani@ucla.edu

EDUCATION:

- **PhD in BioPhysics at *University of Michigan, Ann Arbor*** **2008-13**
Thesis Title: Fluorescence and Photoacoustics based nanoprobe
towards chemical and structural imaging *in vivo*.

- **Integrated MSc in Physics at *Indian Institute of Technology, Kharagpur*** **2003-08**
Combined Bachelor of Science (Honors) and Master's in Physics
Specialization: Lasers and Nonlinear Optics.

ACADEMIC AWARDS AND ACHIEVEMENTS:

- Travel Grant from University of Sao Paulo to attend the *Advanced International School on Modern Trends of Biophotonics, Brazil* **2013**
- The SPIE student Scholarship in Optics and Photonics. **2012**
- University of Michigan Rackham Research Grant. **2010**
- PIBS (Program in Biomedical Science) fellowship, U of M, Ann Arbor. **2008-09**
- Nominated from India for the British Commonwealth Scholarship for doing PhD in Physics in UK. (one student is selected nationwide in this category) **2008**
- Best paper, Indian National workshop on Physics & Technology of All Optical Communication Components and Devices at IIT Kharagpur. **2007**

WORK EXPERIENCE:

- University of California, Los Angeles, USA** **July 2015-present**
Position: Postdoctoral scholar
Mentor: Prof. Aydogan Ozcan
Topic: Field Portable Optical Biosensors based on nanotechnology and holographic imaging
- National institute of Standards and Technology, Boulder & University of Colorado, Boulder, USA** **Apr 2014-June 2015**
Position: Research Associate (Research Faculty position)
Mentor: Dr. J. Hwang and Dr. K. Briggman
Topic: Fluorescence and Dark Field optical imaging for disease diagnostics
- University of Michigan, USA** **Jan 2013-Mar 2014**
Position: Post Doctoral Research Fellow
Mentor: Professor Raoul Kopelman
Topic: Nanotechnology aided optical imaging towards cancer detection
- University of Michigan, USA** **Fall 2008-Fall 2012**
Position: Graduate Research Assistant
Supervisor: Professor Raoul Kopelman and Professor Xueding Wang

Topic: Fluorescence and Photoacoustics based nanoprobe towards chemical and structural imaging *in vivo*.

National Tsinghua University, Hsinchu, Taiwan

Summer 2008

Position: Summer Intern

Supervisor: Professor Yen-Chieh Huang

Topic: Development of terahertz parametric generation using a Mg:O doped Lithium Niobate crystal

Max Planck Institute for the science of light, Erlangen, Germany

Summer 2007

Position: Summer Intern

Supervisor: Professor Philip Russell

Topic: Femtosecond laser micromachining of Photonic Crystal fibers for bio/chemical sensing applications

University of Arizona, Tuscon, USA

Summer 2005

Position: Summer Student

Supervisor: Professor Koen Visscher

Topic: Single molecule fluorescence microscopy for studying single RNA.

Indian Institute of Technology, Kharagpur, India

2005-2008

Position: Undergraduate Research Assistant

Supervisor: Professor Prasanta Kumar Datta

Topic: Development of Lasers and nonlinear optical systems

PUBLICATIONS (till July 2015)

1. A. Ray, R. Kopelman, B. Chon, K. Briggman and J. Hwang, "Scattering Based Hyperspectral Imaging of Plasmonic Nanoplate Clusters Towards Biomedical Applications", *J. Biophotonics*, (In press-2015)
2. **A. Ray**, A. Mukundan, X. Zie, L. Karamchand, X. Wang and R. Kopelman, "Highly stable polymer coated nano-clustered silver plates: A multimodal optical contrast agent for biomedical imaging", *Nanotechnology* 7:25(44):445104 (2014)
3. M. Qin, Y. E. Koo Lee, **A. Ray**, R. Kopelman, "Overcoming Cancer Multidrug Resistance by Codelivery of Doxorubicin and Verapamil with Hydrogel Nanoparticles", *Macromolecular BioScience*. Vol 14, 1106-1115,(2014).
4. T. Shirakura, T. Kelson, **A. Ray**, A. Malyarenko and R. Kopelman, "Hydrogel Nanoparticles with Thermally Controlled Drug Release", *ACS Macro Letters*, Vol 3, 602-606 (2014)
5. **A. Ray** and R. Kopelman, "Polyacrylamide based hydrogel nanoprobe for biophotonic imaging of chemical analytes", *Nanomedicine*, 8(11):1829-38(2013).
6. H. K. Yoon, **A. Ray**, Y. E. Koo Lee, G. Kim, X. Wang and R. Kopelman "Polymer-Protein Hydrogel Nanomatrix for Stabilization of Indocyanine Green towards targeted Fluorescence and Photoacoustic Bio-imaging", *J. of Mat. Chem B*, 1, 5611-5619(2013).
7. **A. Ray**, H. K. Yoon, Y. E. Koo Lee, X. Wang and R. Kopelman "Sonophoric nanoparticle aided pH *in vivo* using Photoacoustic spectroscopy" *Analyst*, 138(11), 3126-30(2013).
8. L. Karamchand, G. Kim, S. Wang, H. J. Hah, **A. Ray**, R. Jiddou, Y. E. Koo Lee, M. A. Philbert and R. Kopelman, "Modulation of Hydrogel Nanoparticle Intracellular Trafficking by Multivalent Surface Engineering with Tumor Targeting Peptide", *Nanoscale*, 5(21):10327-44(2013).

9. **A. Ray**, J. Raijan, Y. E. Koo Lee, X. Wang and R. Kopelman, "Lifetime based photoacoustic oxygen sensing *in-vivo*" *Journal of Biomedical Optics*, 17 (5), 057004 (2012).
10. **A. Ray**, Y. E. Koo Lee, G. Kim and R. Kopelman, "Two-photon fluorescence imaging super-enhanced by multi-shell nano-photonic particles : Application to subcellular pH", *Small*, 8(14), 2213-2221(2012).
11. **A. Ray**, X. Wang, Y. E. Koo Lee, H. J. Hah, G. Kim, T. Chen, D. A. Orringer, O. Sagher, X. Liu and R. Kopelman, "Targeted blue nanoparticles as photoacoustic contrast agent for Brain tumor delineation", *Nano Research*, Vol. 4, Issue 11, 1163-1173 (2011).
12. **A. Ray**, Y.E Lee Koo, T. Epstein, G. Kim and R. Kopelman, "Two-photon nano-PEBBLE sensors: subcellular pH measurements" *Analyst*, Vol. 136, 3616-3622 (2011)
13. **A. Ray**, S. K. Das, L Mishra, P.K. Datta and S. M. Saltiel , "Nonlinearly coupled gain switched second harmonic laser with variable pulse width", *Applied optics*, Vol. 48, Issue 4, 748 (2009)
14. A. Saha, **A. Ray**, S. Mukhopadhyay, P.K Datta, P.K. Dutta and S.Saltiel, "Littrow-type discretely tunable, Q-switched Nd:YAG laser around 1.3 micron", *Applied Physics B*, Vol.87, Issue.3, 431(2007).
15. **A. Ray**, S. K. Das, S. Mukhopadhyay and P.K.Datta, "Acousto-optic modulator stabilized low threshold mode-locked Nd:YVO4 laser", *Applied Physics Letters*, Vol. 89, Issue 22, 221119 (2006)
16. A. Saha, **A. Ray**, S. Mukhopadhyay , N. Sinha, P.K Datta and P.K. Dutta, "Simultaneous multiwavelength oscillation of Nd Laser around 1.3 micron: A possible source for coherent terahertz generation", *Optics Express*, Vol. 14, Issue 11, 4721(2006).

Conference proceedings:

1. T. Shirakura, **A. Ray**, T. Kelson and R. Kopelman, "Development of Temperature-Sensitive Hydrogel Nanoparticles for Targeted Chemotherapy", Annual Meeting & Exposition of the Controlled Release Society 2014.
2. **A. Ray**, H.K. Yoon, R. Kopelman and X. Wang, "Nanosensor aided photoacoustic measurement of pH *in vivo*", Proceedings of SPIE 2013
3. **A. Ray**, J. Rajain, Y. E. Koo Lee, X. Wang and R. Kopelman, "*In vivo* oxygen sensing using lifetime based photoacoustic measurement", Proceedings of SPIE 2013
4. **A. Ray**, H. K. Yoon, H. J. Ryu, Y. E. Koo Lee, G. Kim, X. Wang and R. Kopelman, "Polyacrylamide based ICG nanocarrier for enhanced fluorescence and photoacoustic imaging", Proceedings of SPIE 2013
5. **A. Ray**, Y. E. Koo Lee, R. Elbez and R. Kopelman, "Targeted nanosensor aided three-dimensional pH mapping in tumor spheroids using two-photon microscopy", Proceedings of SPIE 2012
6. **A. Ray**, X. Wang, Y. E. Koo Lee, H. J. Hah, G. Kim, T. Chen, D. A. Orringer, O. Sagher, X. Liu and R. Kopelman, "Photo-acoustic imaging of blue nanoparticle targeted brain tumor for intra-operative glioma delineation", Proceedings of SPIE 2011
7. P.K. Datta, **A. Ray**, K.Hussain, S. Mukhopadhyay, "Acousto-Optic-Modulator-Stabilized, Low Threshold Nonlinear Mirror Mode-locked Laser", IEEE Conference Proceedings 2008.

CONFERENCES:

- **Faraday Discussions on Nanoplasmonics**, Royal Society of Chemistry, London, UK (2015).
- **Gordon Conference on Lasers in Medicine and Biology**, Holderness, NH, USA, (2014).
- **Advanced International School on Modern Trends of Biophotonics**, Sao Paolo, Brazil (2013)
- **Photonics West 2013**, San Fransisco, USA (2013).
- **Gordon Conference on Lasers in Medicine and Biology**, Holderness, NH, USA, (2012).
- **Photonics West 2012**, San Fransisco, USA (2012).
- **European Conferences on Biomedical Optics**, Munich, Germany (2011).
- **PITTCON 2011**, Atlanta, USA (2011).
- **National Conference on the Emerging Trends in the Photovoltaic energy Generation and Utilization**, IIT Kanpur, India (2008).
- **CLEO-Pacific 2007**, Seoul, South Korea, (2007).
- **Indian National Laser Symposium 2007**, Baroda, India (2007).
- **National workshop on Physics & Technology of All-Optical Communication Components and Devices**, I.I.T. Kharagpur, India, (2007).
- **Indian National Laser Symposium 2006**, Center for Advanced Technology, Indore, India (2006).
- **Photonics 2006 (International Conference)**, Hyderabad, India (2006).

MEMBER OF PROFESSIONAL SOCIETIES:

RSC (Royal Society of Chemistry, UK)
SPIE (The international society of Optics and Photonics, USA)
AAAS (American Association for the Advancement of Science)
OSA (Optical Society of America) Ann Arbor Chapter (2008-2013)
OSUM (Optical Society at the University of Michigan) (2012-2013)

TEACHING EXPERIENCES:

General Chemistry (Chem 130)

Fall 2011 and Winter 2012

An introductory class in Physical Chemistry for undergraduate students.

Biophysical Chemistry II (BioPhys 521)

Winter 2012

A graduate level course on biophysical techniques used for research such as Optical Microscopy, Optical spectroscopy, Electron microscopy, X-Ray Diffraction and Nuclear Magnetic Resonance spectroscopy.