

Biomedical and Optics Spectroscopy Lab

Lab Incharge: Dr. Asima Pradhan

1. General

Name of the lab	Biomedical and Optics Spectroscopy Laboratory.
Location	SL-111
Phone number	7691

2. Research Areas

Sl No:	Research Areas
1	Laser Spectroscopy
2	Biophotonics

3. Facilities in the lab(equipments/workstations etc)

Sl no	Name of equipment/workstation/software etc	Quantity
1	ANDOR CCD-SPECTROGRAPH SYSTEM	1
2	MICRO-RAMAN FACILITY	1
3.	POLARIMETERY SYSTEM WITH APOGEE CCD & He-Ne LASER	1
4.	CRYOSTAT	1
5.	FLUOROLOG III SPECTROFLUORIMETER	1

4. Ongoing projects

Sl no.	Project ID	Project Title
1.	DAE-EE-20130166	Shape-based computational fluorescence optical tomography for grading of dysplasia in cervical cancer progression.
2.	CELT-DBT-20130154	Diagnosis of cancer using fluorescence lifetime imaging.
3.	DST-CELT-2013368	Feasibility study for fabrication and testing of hand held probe for in-vivo detection of cervical pre-cancer by biopsy lab, IIT Kanpur.

5. Completed projects(You may not mention all, but please mention the most significant ones with dates) –

Sl no	Completed project name	YEAR	ORGANIZATION
1	Optical Properties and Diagnosis of Tumors using Lasers	1996-1999	DST

2	Spectrofluorimeter for Fluorescence Based Analytical Research	2001	Institute Grants
3	Modernization of Raman System and Removal of Obsolete Data Acquisition System	2002-2003	CARE(IITK)
4	Propagation of Fluorescence Light in Human Breast Tissue	2002-2005	CSIR
5	Modernization of Laser and Optics Laboratory Course	2003	MHRD
6	Intrinsic Fluorescence of Tissues for Diagnosis of Cancer	2004	BRNS
7	Polarized Confocal Imaging of the Cervical Epithelial tissue for neoplasia (early cancer) detection	2005	CARE(IITK)
8	A Combined Approach to Diagnose Cervical and Oral Cancer Using Polarized Raman and Intrinsic Fluorescence Spectroscopy	2006	CSIR

6. 10 most significant of the recent publications =

Sl no	Paper title	Journal name and issue
1	“Distinguishing Cancer and Normal Breast Tissue Autofluorescence Using Continuous Wavelet Transform”, Anita H. Gharekhan, Siddharth Arora, Prasanta K. Panigrahi, and Asima Pradhan .	IEEE JSTQE , 2010 (in press)
2	Polarization gated imaging in tissue phantoms: effect of size distribution, Prashant Shukla and Asima Pradhan .	Applied Optics , Vol. 48 , 6099 (2009)
3	Mueller decomposition images for cervical tissue: Potential for discriminating normal and dysplastic states, Prashant Shukla and Asima Pradhan .	Optics Express , Vol. 17 , 1600 (2009)
4	Simultaneous Extraction of Optical Transport Parameters and Intrinsic Fluorescence of Tissue Mimicking Model Media Using Spatially Resolved Fluorescence Technique, Sharad Gupta, V. L. N Sridhar Raja and Asima Pradhan .	Applied Optics , Vol.45, 28 (2006)
5	Anomalous behaviour of depolarization of light in a turbid medium, Nirmalya Ghosh., Pradeep Kumar Gupta, Asima Pradhan ,S.K.Majumdar.	Physics Letters A , 354, 236-242 (2006)
6	Wavelet based characterization of spectral fluctuations in normal, benign and	Journal of Biomedical Optics Vol.10 (5), p-054012-1 to 9, (2005).

	cancerous human breast tissue, Sharad Gupta, N.C.Biswal, Nidhi Agarwal, Maya S. Nair, Asha Agarwal, P.K.Panigrahi, Asima Pradhan.	
7	Depolarization of light in a multiply scattering medium:Effect of the refractive index of a scatterer, Nirmalya Ghosh, Asima Pradhan , Pradeep Kumar Gupta, Sharad Gupta, V. Jaiswal and R. P. Singh,	Physical Review E 70, 066607, 2004.
8	Recovery of turbidity free fluorescence from measured fluorescence an experimental approach, N.C. Biswal, Sharad Gupta, N. Ghosh and A. Pradhan ,	Optics Express , Vol.11, No. 24, pp. 3320-3331, Dec. 2003
9	Wavelet Transform of Breast Tissue Fluorescence Spectra: A Technique for Diagnosis of Tumors, Nidhi Agarwal, Sharad Gupta, Bhawna, Asima Pradhan and K.Vishwanathan, Prasanta K.Panigrahi	IEEE JSTQE , Vol. 9, #2, , 2003
10	Determination of optical parameters of human breast tissues from spatially resolved fluorescence-A diffusion theory model, Maya S. Nair, N.Ghosh, N.Sundar Raju, Asima Pradhan	Applied Optics , Vol.41, #16, 2002