

Dr. Manas Ranjan Gartia
Associate Professor
Mechanical Engineering
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Education

University College of Engineering, Burla, INDIA	B.S.	04/2000	Mechanical Engineering
Indian Institute of Technology, Kanpur, INDIA	M.S.	08/2003	Computational Fluid Dynamics
University of Illinois, Urbana-Champaign, IL	Ph.D.	09/2013	Nanophotonics, Biosensing
University of Illinois, Urbana-Champaign, IL	Postdoctoral	07/2015	Biomedical Research



The goal of Dr. Gartia's lab is to investigate the role of metabolic remodeling in diseases using spatial lipidomics techniques through recently developed mass spectrometry and Raman microscopy-based analytical methods for studying lipidomics distribution. The developed approach is used to study lipid changes in colon, breast, lung, and pancreatic cancer progression.

For example, in colon cancer, the premise is that altered levels of lipids and their chemical modifications, such as fatty acid oxidation and lipid peroxidation in epiploic fat would lead to increased lipid droplets accumulation in colonic cells which will be damaging for mitochondrial function. The obesity driven colon cancer progression

can be detected and characterized using advanced spectroscopic methods.

As a Ph.D. student at Illinois, Dr. Gartia conducted theoretical and experimental research to understand the primary enhancement mechanism in Raman scattering and fluorescence microscopy. In addition, he has designed sensors using surface plasmon resonance to improve the detection limit of disease biomarkers and enhance the resolution and intensity of fluorescence imaging in live cells. As a postdoc at the Biomedical Research Center, Carle Foundation Hospital & Mills Breast Cancer Institute in Illinois, he expanded his research to include a clinical trial of a medical device (OcuCheck) to detect eye injury.

His lab at LSU focuses on understanding lipid biology and developing novel biophotonics techniques to detect and map small molecules, DNA, lipids, and proteins at cellular and tissue levels. The lab has focused on a wide range of problems, including fibrosis in cardiac and lung

tissues, lipidome profiling in brain tissue and stem cells, and detecting DNA methylation using Raman spectroscopy.

As PI or co-Investigator on several state- and federal-funded grants, Dr. Gartia has successfully administered projects (e.g., staffing, budget, research), collaborated with other researchers, and produced several peer-reviewed publications from each project.