



Centre for Biosystems Science and Engineering

S E M I N A R

Plasmonic structures for protein and cell analysis

4:00 PM, 2nd May 2016

Seminar Hall, MRDG, Biological Sciences Building.

Dr. Shourya Dutta Gupta

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Plasmonics, the study of interaction between light and metal-dielectric structures (generally sub-wavelength), has been exploited significantly in the past for various applications. The speaker will discuss how plasmonic structures can be applied in the study of proteins and human cells. Subsequently, the potential use of these IR plasmonic structures for cancer diagnosis (distinguishing cancerous from non-cancerous cells) will be also shown. The advantages as well as the limitations of plasmonic structure enhanced IR spectroscopy vis-a-vis traditional labelling techniques will also be presented. The talk will include a discussion about a technique complimentary to IR spectroscopy, namely SERS, and how it can be used to interrogate the oxidation state of protein molecules attached to a nanoparticle surface. In particular, the change in the oxidation state of an important heme protein, Cytochrome c, using SERS will be demonstrated. The techniques presented are very generic and can be used for understanding the basic phenomenon in many other biological systems like in the adhesion of cells to biomaterial surfaces under external stimulus as well as for understanding the formation and composition of the 'protein' corona.

About the speaker

Shourya Dutta Gupta received his B. Tech in 2010 from IIT Kanpur, India and PhD in 2015 from EPFL, Switzerland. His doctoral research in bio-plasmonics was carried out at the Nano photonics and Metrology laboratory headed by Prof. O. J. F. Martin. During his PhD, he was also associated with the Institute of Pathology at the Lausanne University Hospital (CHUV) where he carried out most of the human cell culture related work. Since then he has been a post-doctoral researcher at University of Texas at Austin in the group of Prof. G. Shvets. His primary research interests are in the area of plasmonics (study of interaction of light and metallic nano structures) and exploiting the plasmonic effects for studying and potentially enhancing various biological and chemical phenomena. He is currently working in the areas of IR bio sensing (for cancer diagnosis) as well as in graphene-plasmonic nano structures (for active plasmonic devices). He is also a reviewer for international journals like Optics Express, Optics Letters, European Journal of Applied Physics and Journal of Nano photonics.