

# BIOENGINEERING SEMINAR

at 4:00 PM on April 11<sup>th</sup>, 2014 (Friday)

Lecture Hall, 1<sup>st</sup> floor, Materials Engineering Building

## Neural cell response on amorphous carbon nano/micro structures and in the presence of vertical electric field

**Shilpee Jain**

Post-doctoral Fellow

**Department of Chemical Engineering, Indian Institute of Technology, Kanpur**

Among various diseases, neural disorder or neural injury is widely recognized as one of the serious issues. In this talk I will cover some of the possible approaches and related issues to recover damaged nerve. I will discuss the compatibility of various amorphous carbon nano/micro structures, namely, carbon nanofibers, carbon films and carbon micro-patterns with nerve cells [neuroblastoma (N2a) cells and Schwann cells] *in vitro*. I will then explain the neural cell morphology grown on different nano/micro carbon patterned substrates and then cell fate processes i.e. cell proliferation, cell metabolic activity and cell apoptosis analyzed using flow cytometry at various time points in culture. I will also discuss the efficacy of amorphous carbon substrates as neural electrodes to support neuronal cell fate processes in vertical electric field mediated culture conditions and a unique protocol to stimulate nerve cells using these carbon electrodes. Finally, I will discuss my future plans which concern the study of magnetic polymers for therapeutic applications.

### **About the speaker:**

**Dr. Shilpee Jain** is currently a Research Associate with Prof. Ashutosh Sharma in the Department of Chemical Engineering at Indian Institute of Technology Kanpur (IIT K). She has recently been awarded DST-INSPIRE faculty fellowship. She obtained her Master of Technology (M.Tech) degree in Materials Science and Technology from Indian Institute of Technology BHU (IIT BHU), Varanasi in 2009. She earned her PhD in Materials Science and Engineering from IIT K in August 2013. Her thesis entitled "Investigation of Neural Cell Fate Processes on Amorphous Carbon Nanofibers, Films and Patterned Structures" was based on synthesis and characterization of polymer derived carbon patterns for support and guidance of damaged peripheral nerves during regeneration. She also studied the effect of external vertical electric field on neurons cultured on carbon electrodes.