

# Engineering Strategies to Restore the Nervous System

## Overview

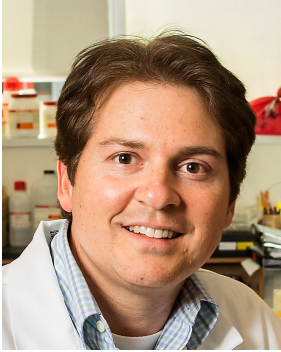
Nervous system trauma and neurodegenerative diseases affect millions of patients annually worldwide, causing significant morbidity and mortality. For instance, the available treatment modalities following traumatic brain injury (TBI) are largely limited to attempts at minimizing secondary injury, maintain cerebral perfusion pressure, and optimize cerebral oxygenation. In cases of peripheral nerve injury (PNI), the gold standard remains end-to-end anastomosis for minor nerve defects and autologous grafts for major injuries. Motor vehicle accidents are the leading cause of neurotrauma worldwide. With over **400 people dying** every day in India from road accidents and many more being debilitated there is an urgent need for technological innovations propelling development of affordable technologies to restore/reconstruct the damaged nervous system. Tissue engineered and regenerative medicine based treatments have considerable promise to facilitate nervous system repair and improve neurological function, and these next-generation approaches have considerable momentum to penetrate the clinical arena and eventually bring relief to large number of patients.

The course will delve at the traditional and emerging strategies in tissue engineering, regenerative medicine, and neural engineering, with a focus on the development of polymer-based scaffolds, cell-based “living scaffolds”, and living bio-hybrid interfaces as constructs to facilitate nervous system regeneration, circuit reconstruction, and neuromodulation.

The course is organized in two modules that should be taken together. The topics in Module A will present an overview of the field of Neural Tissue Engineering with a focus towards biomaterial types and fabrication methods along with their applications in Peripheral and Central Nervous System. Module B will emphasize on Neural Engineering and development of Biohybrid Neuromodulation platforms. A brief overview of the technological landscape in Neural Tissue Engineering with respect to intellectual property and patents would also be provided.

<b>Modules</b>	<b>A: Tissue Engineering &amp; Regenerative Medicine in the Nervous System</b> <b>December 2-6, 2019</b> <b>B: Neural Engineering and Neuromodulation</b> <b>December 9-13, 2019</b>
<b>You Should Attend If -</b>	<ul style="list-style-type: none"><li>• Executives, engineers and researchers from manufacturing, service and government organizations including R&amp;D laboratories.</li><li>• Student at all levels (BTech/MSc/MTech/PhD) or Faculty from reputed academic institutions and technical institutions from any branch having interest in the subject.</li></ul>
<b>Fees</b>	The participation fees for registering the course is as follows: <b>Student Participants: INR 1,000/- (refundable)</b> <b>Participants from abroad: US \$500</b> <b>Industry/ Research Organizations: INR 30,000 + 18 % GST</b> <b>Academic Institutions: INR 10,000 + 18 % GST</b> The above fees include all instructional materials, computer use for tutorials and assignments (if any), laboratory equipment usage charges, and 24-hour free internet facility. The participants will be provided with accommodation on payment basis.

## The Faculty



Dr. D. Kacy Cullen is an Associate Professor of Neurosurgery & Bioengineering at the University of Pennsylvania and the Veterans Affairs Medical Center in Philadelphia (<http://www.med.upenn.edu/cullenlab/>).

Dr. Cullen's current research program operates at the intersection of neural engineering, neurotrauma, and regenerative medicine.



Dr. Utpal Bora is a Professor at Department of Biosciences and Bioengineering, Indian Institute of Technology Guwahati, Guwahati, Assam, India (<http://www.iitg.ac.in/ubora/index.html>).

Prof. Bora's lab works on silk-based biomaterials, nanotechnology with a focus on tissue engineering, regenerative medicine and molecular diagnostics.

## Course Coordinator

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