

Winter 2006 SEMINAR SERIES

F21C Bioprocessing & Biosensing Center

• DIVISION OF FOOD SYSTEMS & BIOENGINEERING •

PRESENTER: Dr. Satish Nair, Professor and Senior Member of IEEE

Department of Electrical and Computer Engineering
University of Missouri – Columbia
Senior Member of IEEE.

TITLE: Modeling Neuroplasticity in the PFC-NAc Synapse Due to Cocaine

ABSTRACT:

The cardinal features of cocaine addiction include uncontrollable urges to obtain drugs and reduced behavioral responding to biological rewards. The fact that these characteristics persist after years of drug abstinence points to enduring neuroplasticity due to cocaine abuse in brain circuitry responsible for processing motivationally relevant stimuli. In rats trained to self administer cocaine, increased Glu release in the PFC-NAc projection and D1 receptor stimulation in the PFC are critical for reinstatement.

In this interdisciplinary project, a computational model of glutamate (Glu) transmission in the PFC-NAc synapse is developed using experimental data from our collaborator. The mechanisms considered are release of glutamate into the synapse, diffusion of synaptic glutamate into the extracellular space, and regulation of Glu in the extracellular space by the cystine-Glu pump and transporters. The specific hypotheses being investigated using the model will be discussed and preliminary results presented.

DATE • TIME • LOCATION:

**Tuesday, May 2, 4:00pm
Ag Eng Bldg 105 • Refreshments**