

# The Department of Physiology and Biophysics

is pleased to announce

## PHSL 7840 Advanced Topics in Cell Signaling

Students select topics of interest and receive one-on-one instruction, tailored to their individual needs and interests, from expert faculty. Each one-credit topic will be taught for 5 weeks (3 hrs/wk). The content of the course work will be decided upon by individual faculty and could include reading and discussing papers, as well as practical exercises. Grading will be based on performance on assignments to be determined by individual faculty. The course director is Dr. Nathan Schoppa.

The topics listed below are ones that we have thought of. If you have an interest that does not appear below, ask us!

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Principles of confocal microscopy

Principles of light microscopy/  
immunocytochemistry

Identification of the protein components of

“molecular machines”

Excitation-contraction coupling in muscle

Neuronal development: genetics, physiology  
and connectivity

Role of specific ion channel isoforms in  
excitability

Role of specific ion channel isoforms in  
development

The life cycle of a synaptic vesicle

Live cell fluorescence imaging

Principles of synaptic transmission

Glial transmitters

Dendritic release of neuropeptides and  
transmitters

Non-traditional neurotransmitters

Neurotransmitter interactions

G-protein receptor-coupled (GPCR)  
signaling

Regulation of transporters through GPCR  
signaling

Cross-talk in cell signaling

Cholinergic signaling in the brain

Astrocytes as active participants in  
synaptic transmission

Endoplasmic reticulum store calcium  
and cell signaling

Endocrine regulation of mammary  
development

The tight junction as a signaling center

Regulation of lipid synthesis and  
catabolism

Anatomy and physiology of the  
auditory system

Neural mechanisms of sound source  
localization

Development of the auditory pathways

Anatomy and physiology of the  
olfactory system

Neuronal synchrony in brain circuits

Mechanisms of dendritic integration  
in neurons

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Permission of the Course Director Required