PHARMACOLOGY AND
PHYSIOLOGICAL SCIENCE
(PH)

PH 0101 - Blood Flow Control in Cardiac and Skeletal Muscle Credit(s): 7 Credits
This group study elective will review the various control mechanisms of
blood flow in resting and exercising skeletal and cardiac muscle. Especial
reference will be given to neural and local humoral factors. Evidence for
the participation of extracellular nucleotide transport will be closely
examined. The phenomenon of transmembrane nucleotide transport
will be examined and discussed in the context of the physiological
significance of extracellular nucleotides in tissue control systems.

PH 0106 - Neurotransmitter Signaling Pathways in Stress and Development
Credit(s): 3-6 Credits
Participation in ongoing activities addressing the effects of stress
and aging on dopaminergic, serotonergic or GABAergic pathways. We
are especially interested in neuronal degeneration. Interdisciplinary
approaches include molecular biology, biochemistry, behavior, genetics,
immunocytochemistry and the generation of transgenics.

PH 0113 - Novel Therapeutic Interventions in Rodent Model of Sepsis
Credit(s): 3-6 Credits

PH 0115 - Neural Mechanisms in Stress Responsiveness
Credit(s): 3-6 Credits (Repeatable for credit)
Acute behavioral stress elicits cardiovascular responses that are very
similar to responses to cocaine administration. We are studying the
neural response pathways that mediate these responses since the
response pattern indicates whether some rats are predisposed to develop
cardiovascular disease. Similar variability in susceptibility to disease
and its relationship to acute stress responsiveness has been observed
in humans. We study blood flows, blood pressure and the sympathetic
nerve responses in conscious, instrumented rats. We examine the CNS
sites that are responsible for response variability. Due to the technical
difficulties involved in these studies, this elective is only available to a
student who will continue to work during the summer.

PH 0116 - Role of Renal Nerves in Hypertension
Credit(s): 3-6 Credits (Repeatable for credit)
We are conducting studies to elucidate the role of the renal nerves in
hypertension and related cardiovascular diseases. Renal nerve ablation is
a new procedure that is being used to reduce arterial pressure in patients
with essential hypertension that is refractory to other treatments. The
mechanism by which this works is unclear but we believe the renal
sensory nerves trigger elevated central sympathetic drive leading to
hypertension, heart failure and other diseases. We will study conscious,
instrumented rats to determine how selective deafferentation of the
kidneys reduces sympathetic nerve activity. We will compare various
means for deafferentation, and determine the effectiveness of renal
deafferentation using immunohistochemical and electrophysiological
procedures. We will also investigate the central neural projections
of specific renal afferent modalities. Due to the technical difficulties
involved in these studies, this elective is only available to a student who
will continue to work during the summer.

PH 0303 - Pharmacology Self-Designed Career Exploration
Credit(s): 1-2 Credits

PH 0403 - Cardiovascular Effects of Cocaine
Credit(s): 2-12 Credits
Studies will be undertaken to describe the cardiovascular effects of
acute and chronic administration of cocaine. Specifically, regional
hemodynamics, sympathetic nerve activity, and cardiac function will be
measured in conscious rats. The CNS mechanisms of the cardiovascular
and cardiotoxic responses to cocaine will be examined also. The student
will be involved in performing experiments on rats, analyzing data, and
preparing a summary of the findings.

PH 0405 - Mechanism of Stress-Induced Cardiac Disease
Credit(s): 2-12 Credits
Studies will be undertaken to describe the cardiovascular effects of
acute and chronic stress. We have identified a subset on rats that are
more sensitive to the cardiotoxic effects of stressful stimuli. In these
experiments, cardiac function will be measured in conscious rats. The
CNS mechanisms mediating cardiovascular and cardiotoxic responses to
stress will be examined. Students will assist in performing experiments
on rats, analyzing data, and preparing a summary of the findings.

PH 0407 - Sympathetic Regulation of Endotoxemia in Drug Abuse
Credit(s): 6 Credits
Studies on the effects of sympathomimetics (e.g., cocaine) on the
inflammatory process elicited by endotoxin will be performed. We will
record hemodynamic variables, sympathetic nerve activity, plasma
cytokines and cytokine expression in conscious, instrumented rats. We
will examine the central and peripheral mechanisms of toxicity using
selective receptor antagonists. The student will assist in performing
experiments, analyzing data and preparing a written summary of the
results.

PH 0408 - Microsurgery
Credit(s): 2-12 Credits
This is an elective for highly motivated students who wish to improve
their manual dexterity by practicing microsurgery using a dissecting
microscope. Students will learn procedures for suturing tissues using
excised blood vessels. Arteries will be transected then sutured (repaired). Students may also create vascular anastomosis. This is an independent
exercise that will help students identify and improve microsurgical skills.

PH 0409 - Cardiovascular Effects of Cocaine and Behavioral Stress
Credit(s): 2-12 Credits
Studies will be undertaken to describe the cardiovascular effects of
cocaine and of behavioral stress. We have noted that rats do not respond
similarly such that some are more prone to adverse cardiovascular
outcomes with cocaine or stress. We will study regional hemodynamics,
sympathetic nerve responses and cardiac function in rats. The CNS
pathways and neurotransmitters responsible for response variability will
be examined. The student will conduct experiments on rats, analyze data
and prepare a summary of the findings.

PH 0410 - Role of Afferent Nerves in Cardiovascular Disease
Credit(s): 2-12 Credits
Studies will be undertaken to describe the effects of selective renal
deafferentation on the development of cardiovascular disease. Renal
denervation in humans ameliorates hypertension, heart failure and renal
failure by unknown mechanisms. We will examine whether renal afferent
nerves are responsible for these positive results in rat models. We will
study experimental models of hypertension and heart failure and we
will use electrophysiological techniques to identify how renal afferent
nerves play a role in elevating sympathetic activity. Students will assist
in performing experiments, analyze data and prepare a summary of the
findings.
PH 0903 - Pharmacological and Physiological Science Research
Credit(s): 1-12 Credits (Repeatable for credit)