CELLULAR AND MOLECULAR NEUROSCIENCE (Biol/Psyc 035)

Fall 2024

COURSE DESCRIPTION

This course focuses on cellular and molecular mechanisms that underlie the development and function of the nervous system. This includes aspects of gene expression (transcription, mRNA metabolism) and cell biology (cellular transport and cytoskeleton, cell cycle, signal transduction, and signaling pathways) as they pertain to neurons and glia. Lectures supplemented by in-class discussion of primary research articles will also serve as an introduction to microscopic, electrophysiological, molecular biological, and genetic techniques and animal models used to study the nervous system and neurological disorders.

CLASS MEETING TIME AND LOCATION

This class will meet in the 11 time slot 11:30-12:35 M,W,F **(LSC 201)** with my office hours (**LSC 324**) from 1-2pm Wednesday**; (*Microscopy Class in LSC 106). Jonathan Tuesday morning 9-11am; Mizuki Thursday3-5PM***

PROFESSOR: Dr. Michael Hoppa
COURSE ASSISTANTS: Mizuki Tojo and Jonathan Rodgers Gochicoa
COURSE LECTURER: Dr. Nicholas Sylvain

COURSE SYLLABUS

SECTION 1: NEURAL DEVELOPMENT

DATE	TOPIC
9/16	NEURAL INDUCTION
9/18	NEURONAL PROLIFERATION AND MIGRATION
9/20	AXON OUTGROWTH (MIZUKI)
9/20	*SEMINAR 2:10PM DR. JEREMY DITTMAN*
9/23	**WEEK 1 QUIZ DUE**
9/23	NEURONAL POLARITY AND TRANSPORT
9/24	SYNAPTOGENESIS X-HOUR
9/25	HANDS ON MICROSCOPY B (LSC 106) NEUROTROPHIC FACTORS
9/27	HANDS ON MICROSCOPY A (LSC 106) NEUROTROPHIC FACTORS
9/30	**WEEK 2 QUIZ DUE**
9/30	GLIAL DEVELOPMENT AND SYNAPTIC REFINEMENT
10/1	LIFE SCIENCE SYMPOSIUM*
10/2	**REVIEW SESSION IN CLASS**
10/4	EXAM DUE 4 PM

SECTION 2: NEURAL COMMUNICATION AND PLASTICITY

10/7	BASICS OF CELLULAR NEUROPHYSIOLOGY
10/9	MOLECULAR ASPECTS OF VOLTAGE-GATED ION CHANNELS
10/11	PRESYNAPTIC FUNCTION BASICS OF CELLULAR NEUROPHYSIOLOGY
10/14	**WEEK 4 QUIZ 3 DUE**
10/14	MOLECULAR MECHANISMS OF VESICLE FUSION
10/16	NEUROTRANSMITTER RECEPTORS I (IONOTROPIC)
10/18	NEUROTRANSMITTER RECEPTORS II (METABOTROPIC)
10/21	**WEEK 5 QUIZ DUE**
10/21	SYNAPTIC PLASTICITY I
10/23	SYNAPTIC PLASTICITY II
10/25	PAPER 1 – SPINES AND PSILOCYBIN
10/25	*SEMINAR AT 2:10PM DR. STEPHEN SMITH*
10/28	**WEEK 6 QUIZ DUE**
10/28	**REVIEW SESSION EXAM II**
10/30	**EXAM 2 DUE 4PM**
11/1	ANIMAL MODELS LECTURE

SECTION 3 MOLECULAR ASPECTS OF HUMAN DISEASE

11/4	MODERN MOLECULAR TOOLS
11/6	NEUROIMMUNE DISORDERS
11/8	PARKINSON'S DISEASE
11/11	**WEEK 7 QUIZ DUE**
11/11	PAPER 2 – GUT BRAIN PARKINSON'S
11/13	ALZHEIMER'S DISEASE
11/15	HUNTINGTON'S DISEASE AND TRINUCLEOTIDE DISORDERS
11/15	*SEMINAR DR. JENNIFER MORGAN*
11/18	**WEEK 8 QUIZ DUE**
11/18	AUTISM SPECTRUM DISORDERS
11/20	**REVIEW SESSION**
11/25	**EXAM III 12:00PM NOON DUE!**

KEY

MAGENTA = EXAMS

YELLOW = LABS FOR ONE GROUP

CYAN = X-TRA CREDIT SEMINAR – ATTENDANCE AND HALF-PAGE SUMMARY GET YOU 1 EXTRA POINT ON FINAL GRADE AVERAGE.

GREY = NO IN PERSON CLASS; ZOOM CLASS