

CELL BIOLOGY

CREDIT	3	INSTRUCTOR	Jon Soderholm
OFFICE	Baekyang Hall N308	OFFICE HOURS	TBA
TIME	09:00 ~ 10:40	CLASSROOM LOCATION	TBA
E-MAIL	jfsoder@yonsei.ac.kr		

[COURSE INFORMATION]

COURSE DESCRIPTION & GOALS	This course will focus on the organization and function of eukaryotic cells. We will discuss in detail topics such as the major organelle systems, the cytoskeleton, the cell cycle, signaling events within cells and between cells, and cell growth and differentiation. Experimental approaches will also be introduced in the context of primary research articles.
PREREQUISITE	Required: Freshman-level Biology Strongly recommended: Organic Chemistry, Biochemistry I, Genetics
COURSE REQUIREMENTS	Students are required to attend all lectures and complete all quizzes and exams. PLEASE NOTE THAT THERE IS NO LABORATORY COMPONENT FOR THIS COURSE.
GRADING POLICY	Final grades will be based on a midterm and a final exam plus four quizzes. The midterm and final exams will each be worth 120 points and 40% of the final grade. Each quiz will be worth 15 points and 5% of the final grade. Attendance is mandatory and failure to attend class will result in a grade reduction.
TEXTS & NOTES	Lectures will be based on the following text: <i>Molecular Cell Biology</i> <i>Lodish, et al.</i> <i>7th edition</i>
INSTRUCTOR'S PROFILE	Jon Soderholm, PhD, Associate Professor, Underwood International College and College of Life Science and Biotechnology, Yonsei University B.S. in Zoology, The University of California, Davis PhD in Molecular Genetics and Cell Biology, The University of Chicago Postdoctoral Fellow, The University of California, Berkeley

[WEEKLY SCHEDULE]

WEEK (PERIOD)	WEEKLY TOPIC & CONTENTS	COURSE MATERIAL & ASSIGNMENTS	NOTES
1	<ul style="list-style-type: none"> -Overview of cell-cell communication -Cell surface receptors, ligand binding, and endocytosis -G-protein-coupled receptors -Signaling downstream of G-protein-coupled receptors -Receptor tyrosine kinases -Signaling in development -Regulation of cell growth and differentiation 		
2	<ul style="list-style-type: none"> -Cell compartmentalization -Structure and function of cell membranes -The nuclear envelope and nuclear pore complexes -Nucleocytoplasmic transport -Nuclear subdomains and the regulation of gene expression -The endoplasmic reticulum -Transport of soluble and membrane proteins into the ER -Posttranslational modification and quality control in the ER 		
3	<ul style="list-style-type: none"> -ER-to-Golgi transport: cargo recognition and COPII coat formation -Vesicle budding, trafficking to the Golgi, and membrane fusion -Transport through the Golgi apparatus: vesicular transport and cisternal maturation -Post-Golgi sorting to the endosomal and lysosomal systems and the plasma membrane -Protein import into mitochondria and chloroplasts -Organelle inheritance <p>MIDTERM EXAM</p>		

WEEK (PERIOD)	WEEKLY TOPIC & CONTENTS	COURSE MATERIAL & ASSIGNMENTS	NOTES
4	<ul style="list-style-type: none"> -Actin dynamics and microfilament structure -Actin binding proteins and the regulation of actin dynamics in the cell -Actin, myosin, and muscle contraction -Intermediate filaments -Tubulin structure and microtubule dynamics -Microtubule-binding proteins and molecular motors 		
5	<ul style="list-style-type: none"> -Overview of the cell cycle -Cyclins and cyclin-dependent kinases -The G1 to S transition and DNA replication -The G2 to M transition and mitosis -Early stages of mitosis: spindle assembly -Late stages of mitosis: spindle dynamics, chromosome segregation, nuclear envelope reassembly and cytokinesis -Apoptosis -Cell senescence -Cancer 		
6	<ul style="list-style-type: none"> -Stem cell biology and cloning -Bioinformatics in cell biology -The future of cell biology <p>FINAL EXAM</p>		