

SYLLABUS

Classification	Elective	Course No.	9617	Cr. Hrs.	3	Instructor	Jae Il Kim
Course Title	Korean	생체분자 구조-기능 특론 I					
	English	Current Topics on Structure & Function of Biomolecules I					
<p>Course Outline : This course is divided into three major parts dealing with significant recent advances in the study of biomolecular structure, protein-protein interaction, and screening of bioactive ligands</p>							
Prerequisite							
Textbook and References		Nature, Science, and Nature Structural Biology etc.					
Weekly Course Schedule							
Calendar	Description					Lecturers	
1st week	개강일(9.1) Structural Basis for Recognition					Jae Il Kim	
2nd week	Classification of Protein-Protein Complexes					"	
3rd week	"					"	
4th week	Structural Properties of Protein-Protein Interfaces					"	
5th week	"					"	
6th week	Prediction of Protein-Protein Interaction Sites					"	
7th week	Application for Protein-Protein Interactions					Invited Speaker	
8th week	Midterm Exam(10.23-10.27)					—	
9th week	Cooperativity in Protein-Peptide Interactions					Jae Il Kim	
10th week	"					"	
11th week	Protein-Ligand Interactions					"	
12th week	"					"	
13th week	Model for Three-dimensional Structure Changes					"	
14th week	"					"	
15th week	Examples of Protein-Ligand Interactions					Invited Speaker	
16th week	Final Exam					—	

* If there will be experiments, mark it in the "Remarks".

Coordinator Jae Il Kim
Dept. Chair Chul-Seung Park



SYLLABUS

Classification	Elective	Course No.	9618	Cr. Hrs.	3	Instructor	Soo Hyun Eom
Course Title	Korean	생체분자구조-기능 특론 II					
	English	Current Topics on Structure & Function of Biomolecules II					
<u>Course Outline</u> : This course will cover recent advances in the field of biological macromolecular machineries							
Prerequisite							
Textbook and References		Cell, Nature, Science, Nature structural biology, etc.					
Weekly Course Schedule							
Calendar	Description					Lecturers	
1st week	Introduction – Biological macromolecular machineries					Soo Hyun Eom	
2nd week	DNA duplication machineries					"	
3rd week	"					"	
4th week	Transcription machineries					"	
5th week	"					"	
6th week	Translation machineries					"	
7th week	"					"	
8th week	Midterm Exam					---	
9th week	Chaperonins					"	
10th week	Proteosomes					"	
11th week	"					"	
12th week	Transporters					"	
13th week	"					"	
14th week	Molecular motors					"	
15th week	"					"	
16th week	Final Exam					"	

* If there will be experiments, mark it in the "Remarks

Coordinator
Dept. Chair

Soo Hyun Eom
Chul-Seung Park



SYLLABUS

Classification	Elective	Course No.	9644	Cr. Hrs.	3	Instructor	Chul-Seung Park
Course Title	Korean	이온통로 단백질 I					
	English	Ion Channel Proteins I					
Course Outline : In this course, we will discuss about various ion channels in cell membranes. Our focus will be the functional characteristics and the physiological relevance of the individual ion channels.							
Prerequisite		None					
Textbook and References		Ion Channels of Excitable Membranes (B. Hille, 3rd Ed. 2001, Sinauers); Ion Channels and Diseases (F. M. Ashcroft, Academic Press, 2000)					
Weekly Course Schedule							
Calendar	Description						Lecturers
1st week	Introduction to Ion Channels						C.-S. Park
2nd week	Voltage-Gated Sodium Channels						C.-S. Park
3rd week	Voltage-Gated Potassium Channels						C.-S. Park
4th week	Other Potassium Channels						C.-S. Park
5th week	Voltage-Gated Calcium Channels						C.-S. Park
6th week	Voltage-Gated Chloride Channels						C.-S. Park
7th week	Cyclic Nucleotide-Gated Channels						C.-S. Park
8th week	Cystic Fibrosis Transmembrane Conductance Regulator						C.-S. Park
9th week	Epithelial Sodium Channels						C.-S. Park
10th week	Ligand-Gated Calcium Channels						C.-S. Park
11th week	Acetylcholine Receptors & Glutamate Receptors						C.-S. Park
12th week	GABA _A Receptors and Glycine Receptors						C.-S. Park
13th week	TRP Channels						C.-S. Park
14th week	Water Channels & Gap Junction Channels						C.-S. Park
15th week	Other Channels						C.-S. Park
16th week	Final Exam						

* If there will be experiments, mark it in the "Remarks".

Coordinator Chul-Seung Park

Dept. Chair Chul-Seung Park



SYLLABUS

Classification	Elective	Course No.	9651	Cr. Hrs.	3	Instructor	Sunghoe Chang
Course Title	Korean	세포신경생리학					
	English	Cellular Neurophysiology					
<u>Course Outline</u> : This course will discuss the basic properties of neurons and their interactions in the nervous system. Topics include neurocytology, the basic properties of membranes, neurotransmission, the formation and regeneration of synapse, the cellular basis of higher brain function and diseases of the nervous system. The course will also cover the basic microscopy and its application to neuronal system.							
Prerequisite		Basic knowledge in Cell Biology and Biochemistry					
Textbook and References		Principles of Neural Science by Kandel, Schwartz and Jessell Molecular Biology of the Cell by Alberts et. al.					
Weekly Course Schedule							
Calendar	Description						Lecturers
1st week	The Cytology of Neurons						Sunghoe Chang
2nd week	Synthesis and Trafficking of Neuronal Protein						"
3rd week	Ion Channels						"
4th week	Membrane Structure and Transport						"
5th week	The Basic Properties of Neuronal Membrane I						"
6th week	Cytoskeletons and Axonal Growth						"
7th week	Neurotransmitters						"
8th week	Synaptic Transmission						"
9th week	The Basic Properties of Neuronal Membrane II; Hodgkin & Huxley Model						"
10th week	The Formation and Regeneration of Synapses						"
11th week	The Guidance of Axons to Their Targets						"
12th week	The Cellular Basis of Neurodegenerative Diseases						"
13th week	Learning and Memory						"
14th week	Cellular Mechanism of Learning and the Biological basis of Individuality						"
15th week	Basic Microscopy						"
16th week	Imaging Neurons						"

* If there will be experiments, mark it in the "Remarks".

Coordinator Sunghoe Chang
 Dept. Chair Chul-Seung Park



SYLLABUS

Classification	Elective	Course No.	9656	Cr. Hrs.	3	Instructor	Zee-Yong Park
Course Title	Korean	질량 분석기를 이용한 전단백질체 연구					
	English	Mass Spectrometry based Proteomics					
Course Outline : This course is designed to facilitate the understanding of various mass spectrometric techniques used in proteomics area and to help students to choose a right mass sepcctrometric method for their research.							
Prerequisite		none					
Textbook and References		Handouts					
Weekly Course Schedule							
Calendar	Description						Lecturers
1st week	Introduction						Zee-Yong Park
2nd week	Principles of Proteomics Research						Zee-Yong Park
3rd week	Mass Spectrometry Instrumentation I						Zee-Yong Park
4th week	Mass Spectrometry Instrumentation II						Zee-Yong Park
5th week	Protein Identification						Zee-Yong Park
6th week	Protein Quantification						Zee-Yong Park
7th week	Mass Spectrometric Techniques for Protein Profiling						Zee-Yong Park
8th week	Mid-term Exam						-
9th week	Mass Spectrometric Techniques for Protein Interactions						Zee-Yong Park
10th week	Protein Modification Analysis						Zee-Yong Park
11th week	Mass Spectrometric Data Analysis						Zee-Yong Park
12th week	Computational Techniques in Proteomics						Zee-Yong Park
13th week	Medical Applications of Proteomics						Zee-Yong Park
14th week	Proteomics Experimental Design						Zee-Yong Park
15th week	Problems and Emerging Techniques of Proteomics						Zee-Yong Park
16th week	Final Exam						Zee-Yong Park

* If there will be experiments, mark it in the "Remarks".

Coordinator

Zee-Yong Park

Dept. Chair

Chul-Seung Park



SYLLABUS

Classification	Elective	Course No.	9657	Cr. Hrs.	3	Instructor	Sangyong Jon
Course Title	Korean	나노바이오테크놀로지분야의 최신평의 I					
	English	Current Topics in Nanobiotechnology I					
Course Outline :							
This course is intended for students who interested in understanding multidisciplinary research of biology, chemistry, medicine, and engineering.							
Recent articles related to nanobiotechnology will provied students with new concepts and ideas and help students to prepare for future potential collaborations will people working in such areas.							
Prerequisite		None					
Textbook and References		Recent review papers and original articles					
Weekly Course Schedule							
Calendar	Description						Lecturers
1st week	Nanobiotechnology Overview						Sangyong Jon
2nd week	Nano-medicines						Sangyong Jon
3rd week	Nano-medicines						Sangyong Jon
4th week	Nano-medicines						Sangyong Jon
5th week	Nano-medicines						Sangyong Jon
6th week	Nano-medicines						Sangyong Jon
7th week	Nano-medicines						Sangyong Jon
8th week	Term Report I						Sangyong Jon
9th week	Nano-Drug Delivery System						Sangyong Jon
10th week	Nano-Drug Delivery System						Sangyong Jon
11th week	Nano-Drug Delivery System						Sangyong Jon
12th week	Nano-Drug Delivery System						Sangyong Jon
13th week	Nano-Drug Delivery System						Sangyong Jon
14th week	Nano-Drug Delivery System						Sangyong Jon
15th week	Nano-Drug Delivery System						Sangyong Jon
16th week	Term Report II						Sangyong Jon

* If there will be experiments, mark it in the "Remarks".

Coordinator Sangyong Jon
 Dept. Chair Chul-Seung Park



SYLLABUS

Classification	Elective	Course No.	9660	Cr. Hrs.	3	Instructor	Joo Young Lee
Course Title	Korean	선천성면역시스템조절의 최신동향					
	English	Current topics in Innate Immunity					
<u>Course Outline</u> : To understand the mechanism as to how innate immunity is triggered and amplified as body defense mechanism against microbial infection and to follow the current flow in innate immunity research.							
Prerequisite		n/a					
Textbook and References		Immunobiology (C.A. Janeway, 5th ed), Molecular aspects of immune response and infectious diseases (K.H. Hiroshi), published articles.					
Weekly Course Schedule							
Calendar	Description					Lecturers	
1st week	An Introduction to innate immunity					Joo Young Lee	
2nd week	Evolution in innate immunity					Joo Young Lee	
3rd week	innate immune cells (macrophages, mast cells, dendritic cells, natural killer cells)					Joo Young Lee	
4th week	Toll-like receptors and signalings (I)					Joo Young Lee	
5th week	Toll-like receptors and signalings (II)					Joo Young Lee	
6th week	Bacterial pathogens					Joo Young Lee	
7th week	NLRs and innate immunity					Joo Young Lee	
8th week	Mid-term Exam					Joo Young Lee	
9th week	Non-Toll recognition of micro-organism					Joo Young Lee	
10th week	Anti-viral innate immunity					Joo Young Lee	
11th week	Host-derived modulators of innate immunity					Joo Young Lee	
12th week	Innate control of adaptive effector mechanism (NKG2)					Joo Young Lee	
13th week	Interaction with other receptors					Joo Young Lee	
14th week	Innate immunity in plants					Joo Young Lee	
15th week	The implications in chronic diseases					Joo Young Lee	
16th week	Final Exam					Joo Young Lee	

* If there will be experiments, mark it in the "Remarks".

Coordinator Joo Young Lee
 Dept. Chair Chul Seung Park



SYLLABUS

Classification	Elective	Course No.	9663	Cr. Hrs.	3	Instructor	Chang-Duk Jun
Course Title	Korean	의학 미생물 및 면역학					
	English	Medical Microbiology and Immunology					
<u>Course Outline</u> : It simply is not true that microbe + host = disease, and clinicians are well aware of this. Thus, host response against invaded microorganisms should be discussed in terms of pathologic signs and symptoms and in terms of immune control.							
Prerequisite		Immunology & Microbiology					
Textbook and References		Medical Microbiology, 3rd edition; Cellular and Molecular Immunology 5th edition.					
Weekly Course Schedule							
Calendar	Description					Lecturers	
1st week	개강일(9.1) Microbes and parasites					Chang-Duk Jun	
2nd week	Host-parasite response					Chang-Duk Jun	
3rd week	Organisms					Chang-Duk Jun	
4th week	The innate defenses of the body I					Chang-Duk Jun	
5th week	The innate defenses of the body II					Chang-Duk Jun	
6th week	The Adaptive responses of the body I					Chang-Duk Jun	
7th week	The Adaptive responses of the body II					Chang-Duk Jun	
8th week	Mid-term Exam					Chang-Duk Jun	
9th week	The cellular basis of adaptive immune responses					Chang-Duk Jun	
10th week	Entry, exit, and transmission					Chang-Duk Jun	
11th week	Spread and replication					Chang-Duk Jun	
12th week	Parasite survival strategies and persistent infections					Chang-Duk Jun	
13th week	Identification of diseases in pathology					Chang-Duk Jun	
14th week	Gastrointestinal diseases					Chang-Duk Jun	
15th week	Pathology of rheumatoid arthritis					Chang-Duk Jun	
16th week	Final Exam					Chang-Duk Jun	

* If there will be experiments, mark it in the "Remarks".

Coordinator Chang-Duk Jun
Dept. Chair Chul-Seung Park



SYLLABUS

Classification	Elective	Course No.	9677	Cr. Hrs.	3	Instructor	Do Han Kim
Course Title	Korean	칼슘매개 생체신호전달					
	English	Calcium Signaling					
<u>Course Outline</u> : This course will cover recent progresses in the research fields concerning the structure and function of various calcium signaling proteins involved in various essential biological functions.							
Prerequisite							
Textbook and References		Recent research and review papers related to calcium signaling processes					
Weekly Course Schedule							
Calendar	Description					Lecturers	
1st week	Excitation-contraction coupling					Do Han Kim	
2nd week	"					"	
3rd week	"					"	
4th week	"					"	
5th week	Ca ²⁺ signaling in nerve cells					"	
6th week	"					"	
7th week	"					"	
8th week	Ca ²⁺ signaling in other tissues					"	
9th week	"					"	
10th week	"					"	
11th week	Structure and function of Ca ²⁺ binding proteins					"	
12th week	"					"	
13th week	"					"	
14th week	Role of Ca ²⁺ in apoptosis					"	
15th week	"					"	
16th week	기말 시험					"	

* If there will be experiments, mark it in the "Remarks".

Coordinator Do Han Kim

Dept. Chair Chul-Seung Park



SYLLABUS

Classification	Elective	Course No.	9678	Cr. Hrs.	3	Instructor	Chung Hee Cho
Course Title	Korean	유전조절개론					
	English	Classic Experiments in Gene Regulation					
<u>Course Outline</u> Genetic aspects of mammalian reproduction will be discussed in this course. Thus the course will provide students with better understanding of genetic and molecular mechanism underlying mammalian reproduction.							
Prerequisite							
Textbook and References							
Weekly Course Schedule							
Calendar	Description					Lecturers	
1st week	Introduction					Chung Hee Cho	
2nd week	Testis					"	
3rd week	Spermatogonia					"	
4th week	Spermatid					"	
5th week	Spermatozoa					"	
6th week	Sperm Acrosome					"	
7th week	Sperm Tail					"	
8th week	Mid Term Exam					"	
9th week	Oogonia					"	
10th week	Oocyte					"	
11th week	Ovulation					"	
12th week	Egg					"	
13th week	Egg Zona Pellucida					"	
14th week	Sperm-Egg Adhesion					"	
15th week	Sperm-Egg Fusion					"	
16th week	Final Exam						

* If there will be experiments, mark it in the "Remarks".

Coordinator Chung Hee Cho

Dept. Chair Chul-Seung Park



SYLLABUS

Classification	Elective	Course No.	9681	Cr. Hrs.	3	Instructor	Yong-Chul Kim
Course Title	Korean	퓨린 수용체					
	English	Purine Receptors					
<u>Course Outline :</u> This course will cover the recent research trends in pharmacological aspects and medicinal chemistry of purine receptors, which are classified to adenosine and nucleotide receptors.							
Prerequisite							
Textbook and References		Recent review papers and original articles.					
Weekly Course Schedule							
Calendar	Description					Lecturers	
1st week	Introduction					Yong-Chul Kim	
2nd week	Pharmacology of Adenosine A1 Receptors					"	
3rd week	Medicinal Chemistry of Adenosine A1 Receptors					"	
4th week	Pharmacology of Adenosine A2A Receptors					"	
5th week	Medicinal Chemistry of Adenosine A2A Receptors					"	
6th week	Pharmacology of Adenosine A2B Receptors					"	
7th week	Medicinal Chemistry of Adenosine A2B Receptors					"	
8th week	Mid-term Exam					"	
9th week	Pharmacology of Adenosine A3 Receptors					"	
10th week	Medicinal Chemistry of Adenosine A3 Receptors					"	
11th week	Pharmacology of P2X Receptors					"	
12th week	Pharmacology of P2X3 Receptors					"	
13th week	Pharmacology of P2X7 Receptors					"	
14th week	Pharmacology of P2Y Receptors					"	
15th week	Medicinal Chemistry of P2Y Receptors					"	
16th week	Final Exam						

* If there will be experiments, mark it in the "Remarks".

Coordinator Yong-Chul Kim

Dept. Chair Chul-Seung Park



SYLLABUS

Classification	Elective	Course No.	9683	Cr. Hrs.	3	Instructor	Jang-Soo Chun
Course Title	Korean	질병의 분자생물학 II					
	English	Molecular biology of disease II					
<u>Course Outline :</u> This Course will address basic molecular research to clinical aspects of degenerative human disease							
Prerequisite							
Textbook and References							
Weekly Course Schedule							
Calendar	Description					Lecturers	
1st week	Introduction					Jang Soo Chun	
2nd week	Molecular aspects of brain disease I					Jang Soo Chun	
3rd week	Molecular aspects of brain disease II					Jang Soo Chun	
4th week	Clinical aspects of brain disease I					Invited Speaker	
5th week	Clinical aspects of brain disease II					Invited Speaker	
6th week	Molecular aspects of muscular disease I					Jang Soo Chun	
7th week	Molecular aspects of muscular disease II					Jang Soo Chun	
8th week	Exam					Jang Soo Chun	
9th week	Clinical aspects of muscular disease I					Invited Speaker	
10th week	Clinical aspects of muscular disease II					Invited Speaker	
11th week	Molecular aspects of cardiovascular disease I					Jang Soo Chun	
12th week	Molecular aspects of cardiovascular disease II					Jang Soo Chun	
13th week	Clinical aspects of cardiovascular disease I					Invited Speaker	
14th week	Clinical aspects of cardiovascular disease III					Invited Speaker	
15th week	Discussion					Jang Soo Chun	
16th week	Final Exam					Jang Soo Chun	

* If there will be experiments, mark it in the "Remarks".

Coordinator Jang Soo Chun
Dept. Chair Chul-Seung Park



SYLLABUS

Classification	Elective	Course No.	9692	Cr. Hrs.	3	Instructor	Sin-Hyeog Im
Course Title	Korean	사이토카인 분자 생물학					
	English	Cytokine Molecular Biology					
Course Outline : Cytokines are proteins secreted by immune cells in response to various antigens and mediate diverse response of immune cells involved in immunity, inflammation and tolerance. This course is to convey an understanding of key concepts about the role of cytokines in immune regulation, mechanism of gene regulation and cytokine receptor-mediated signaling. Basic concepts will be covered by lecturer but each participant is expected to present recent research articles published in prestigious journals.							
Prerequisite		Attendants should be familiar with basic concepts of immunology and molecular biology.					
Textbook and References		The Molecular Biology of Cytokines (by Yony Meager, John Wiley & Sons Press), textbook chapters and recent articles.					
Weekly Course Schedule							
Calendar	Description					Lecturers	
1st week	IL-10: Protein, Biological activities and IL-10 Therapy					S.-H. Im	
2nd week	IL-10: Gene regulation					S.-H. Im	
3rd week	IL-10 Receptor and signal transduction					S.-H. Im	
4th week	IL-10 family members: IL-19 and IL-24					S.-H. Im	
5th week	IL-10 family member: IL-20					S.-H. Im	
6th week	IL-10 family members: IL-22 and IL-26					S.-H. Im	
7th week	Th2 cytokine: IL-4					S.-H. Im	
8th week	Mid-term Exam					S.-H. Im	
9th week	Th2 cytokines: IL-5 and IL-13					S.-H. Im	
10th week	Th1 cytokine: IL-2					S.-H. Im	
11th week	Th1 cytokine: IL-12 and IL-18					S.-H. Im	
12th week	Th1 cytokine: IFN-gamma					S.-H. Im	
13th week	TGF-beta					S.-H. Im	
14th week	TNF-alpha					S.-H. Im	
15th week	Interferons					S.-H. Im	
16th week	Final Exam					S.-H. Im	

* If there will be experiments, mark it in the "Remarks".

Lecturer
Dept. Chair

Sin-Hyeog Im
Chul-Seung Park

