

Special Subjects of the Department of Basic Biology

Field	Subject Code	Subject	Credit	Content of subject	
Cell Biology Developmental Biology Environmental Biology Neurobiology Evolution, diversity and genomic biology Reproductive biology	20DBB001	Introduction To Basic Biology I	2	Introduction of the research conducted at NIBB by all professors, associate professors and assistant professors.	Noriyuki Kinoshita Yuriko Komine
	20DBB002	Introduction To Basic Biology II	2		
	20DBB003	Cell Biology	1	After Robert Hooke's discovery of the "cell" using a microscope of his own making, the field of cell biology flourished. Thereafter, our knowledge on the cell, a fundamental element of organisms, has drastically expanded, associated with advancement in imaging and experimental technologies. In this course, essence of the discoveries in the cell biology field is delivered, especially focusing on the five topics listed below. 1. Breakthrough technologies in microscopy and imaging 2. Cell structures and intracellular transport 3. Regulatory mechanisms of gene expression 4. Cell cycle regulation 5. Visualization and quantification of cellular dynamics	Takashi Ueda Kazuhiro Aoki Jun-ichi Nakayama Shigenori Nonaka Nobuyuki Shiina Yusuke Miyanari Tomomi Tsubouchi Shoji Mano
	20DBB004	Developmental Biology	1	Multicellular organisms such as animals and plants develop from a single cell, a fertilized egg through many rounds of cell division, cell differentiation regulated by complex but precise interactions of tissues, and three-dimensional morphogenesis. In this course, lectures regarding to the formation of body axes, mechanism of cell differentiation, cell movements during development, metabolic regulation, which are all essential processes for the morphogenesis of multicellular organisms. In addition, evolutionary developmental biology (Evo-Devo) aspects of biodiversity are also discussed.	Toshihiro Fujimori Naoto Ueno Shinji Takada Ryuji Kodama Noriyuki Kinoshita Kensuke Kawade Hiroki Takahashi
	20DBB005	Environmental Biology	1	This lecture course provides you with opportunity to study how living organisms interact with environments. The effects of several environmental factors such as light, gravity, and temperature on living organisms, and their response to the environmental factors will be lectured. In particular, seminal topics on photoacclimation/adaptation mechanism of plants including photosynthesis, and mechanical principles of plant movements and molecular mechanisms of plant response to gravity will be discussed.	Jun Minagawa Miyo Morita-Terao Yasuhiro Kamei Shunichi Takahashi Ryutaro Tokutsu Takashi Nishimura
	20DBB006	Neurobiology	1	In this course, lectures on three topics in neuroscience will be delivered: 1. Development of the neurons system. 2. Organization and function of locomotor circuits in the spinal cord. 3. Mechanisms underlying the information processing in the retina and brain. Basic knowledge and future topics will be discussed in historical perspective.	Shinichi Higashijima Eiji Watanabe
	20DBB007	Evolution, diversity and genomic biology	1	The course will introduce seven topics on modern evolutionary biology covering the fundamentals of the methods for comparative genomics analyses. The first topic includes variant detection, orthology analysis, whole genome comparison and detection of selection signature. Continuously, it will introduce the evolutionary mechanism that brings about the diversity of plants and animals. Development and resulted morphology in bryophytes, lycopods, monilophytes, gymnosperms, and angiosperms will be discussed with incorporating the inference of the common ancestor of land plants and subsequent evolution. Turnovers of sex determination genes have frequently happened during the evolution of vertebrates. Genetic and genomic basis of this phenomenon will be discussed using fish as models. The evolutionary novelties acquired by insects through evolution will be discussed. Flagella in eukaryotes are the molecular machinery composed of tubulins and other proteins. Roles of tubulin superfamily genes will be discussed in relation with microtubule and flagella structures. Arbuscular mycorrhiza and root nodule symbioses are mutually successful and beneficial interactions on earth. The evolution of plant-microbe symbioses by recruiting or neo-functionalizing common factors will be discussed.	Masayoshi Kawaguchi Mitsuyasu Hasebe Teruyuki Niimi Kiyoshi Naruse Takashi Murata Shuji Shigenobu Takashi Soyano

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Reproductive biology	20DBB008	Reproductive biology	1	Reproduction is indispensable for the continuity of life. In this class, a number of fundamental questions during the course of reproduction starting from germ cell formation to fertilization will be lectured using a variety of organisms (e.g., yeast, fly, fish, and mouse). Further, the lecturers will talk about practical issues of researchers with regard to how to select the organisms to study or how to challenge the long-term and short-term biological questions.	Shosei Yoshida
	20DBB009	Practical Spoken English I a	1	Communication and Presentation courses focus on improving and building the communication and presentation skills necessary for researchers. Classes incorporate both lecture and student practice exercises touching on subjects such as handling questions, presenting clear, logical arguments, etc.	Sechrist, Jeremiah S Noriyuki Kinoshita
	20DBB010	Practical Spoken English I b			
	20DBB011	Practical Spoken English II a			
	20DBB012	Practical Spoken English II b			
	20DBB013	Practical Spoken English III a			
	20DBB014	Practical Spoken English III b			
	20DBB015	Practical Spoken English IV a			
	20DBB016	Practical Spoken English IV b			
	20DBB017	Practical Spoken English V a			
20DBB018	Practical Spoken English V b				
Developmental Biology	20DBB019	Practical Scientific Writing I a	1	Lectures and practice to expand English literacy in science	Shosei Yoshida Noriyuki Kinoshita Yuriko Komine
	20DBB020	Practical Scientific Writing I b			
	20DBB021	Practical Scientific Writing II a			
	20DBB022	Practical Scientific Writing II b			
	20DBB023	Practical Scientific Writing III a			
	20DBB024	Practical Scientific Writing III b			
	20DBB025	Practical Scientific Writing IV a			
	20DBB026	Practical Scientific Writing IV b			
	20DBB027	Practical Scientific Writing V a			
	20DBB028	Practical Scientific Writing V b			
Cell Biology	20DBB029	Advanced Conference I	1	Attending an international meeting held at NIBB, students are exposed to frontier research topics and engage in discussion with senior researchers.	Ikuro Uchiyama
	20DBB030	Advanced Conference II			
	20DBB031	Advanced Conference III			
	20DBB032	Advanced Conference IV			
	20DBB033	Advanced Conference V			