

Doctoral Program in Biomedical Sciences

Common Subjects

Course Number	Course Name	授業方法	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
02EW037	Initiation Seminar for Career Path	1	1.0	1, 2	SprABC	Intensive		Kazuya Morikawa, Keiko Ookawa	In this first course of the Doctoral program in Biomedical Science, the students study the aims and objectives of the program, curriculum policies, lineups and time tables of the curriculum, and possible research topics in the program. In the career path seminar, the students recognize a wide variety of possible future careers through lectures by guest lecturers, have discussions with their classmates, and then make study plans for the program.	Compulsory (Choose either 02EW001, which was available until 2016)
02EW002	Introduction to Medical Research	1	1.0	1, 2	SprAB	Thu/Fri 7, 8	4A203	Chief of the Academic Committee of Biomedical Sciences, Kazuya Morikawa, Aya Fukuda, Makoto Kobayashi, Takashi Kudo, Kaoru Takeuchi, Thomas David Mayers	This course provides the opportunities for the students to learn the essential knowledge of the physical- and chemical-hazard, bio-hazard, information security, research ethics, and legal requirements, and also to understand how to use the research facilities and equipments on biomedical research.	Compulsory
02EW003	Seminar in Medical Sciences	2	3.0	1, 2	Annual	by appointment		Chair of Biomedical Sciences, Chief of the Academic Committee of Biomedical Sciences	Students attend 3 or more designated 'seminars in medical sciences' and participate in discussion. In addition, students will deepen their understanding by reading original research papers in a related field, by conducting a discussion about its contents with their advising faculty, and by writing papers.	Compulsory
02EW004	Special Studies on Medical Sciences	2	2.0	1, 2	Annual	by appointment		Chair of Biomedical Sciences, Research supervisors	Students learn fundamental knowledges required to set their PhD research subjects and how to obtain them under the instruction of their research supervisors. Then the students determine their research subjects as well as the methods to fulfill their research questions. The students then submit necessary applications for the PhD research, and make up a prospect for completing the dissertation.	Compulsory
02EW005	Special Practice in Medical Sciences	2	5.0	1, 2	Annual	by appointment		Chair of Biomedical Sciences, Research supervisors	Students will learn how to analyze the research results and to understand the significance of the results under the supervision of professors. Students will also plan and perform the next research process and repeat this cycle.	Compulsory
02EW031	Technical English in Medical Sciences	2	2.0	1, 2	Annual	by appointment		Flaminia Miyamasu	Students will first learn the basic principles of scientific writing style and composition. They will then apply these principles by writing and editing their own research papers.	
02EW021	Medical and Scientific Communication I	2	1.0	1, 2	SprAB	by appointment		Kiong Ho	A literature-based, seminar-type course for the students to evaluate and review the latest scientific breakthrough in Medical Sciences. The goal of this course is for students to develop the proficiency they need to effectively and energetically communicate their professional achievements within the international scientific community. Students in this course will practice scientific reading, presentation and feedback on their performance from peers and instructors.	Doctoral Students in Medical Sciences
02EW022	Medical and Scientific Communication II	2	3.0	2, 3	Annual	by appointment		Kazuya Morikawa	In this subject, students present and discuss about their researches in conferences held overseas of international conferences in Japan when its official language is English. They also need to make questions to presentations given by other speakers, and discuss about their researches.	

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02EW033	Research Presentation and Discussion	2	1.0	2, 3	SprABC	Wed2		Hiroyuki Suzuki, Thomas David Mayers	In this course, you will learn how to improve your scientific presentation, discussion and critical thinking skills in English. Each week, invited speakers will give interesting presentations about their research which will be followed by a discussion time. In the final weeks, students will present and discuss about their own research.	
02EW007	International Practical Medical Sciences	1	3.0	1 - 4	Annual	by appointment		Tadachika Koganezawa	Through presentations of research results at international academic conferences and training abroad, students will acquire language ability and learn presentation methods while experiencing internationally recognizable research by holding discussions with researchers overseas. Furthermore, students will participate actively in discussion and educational research abroad as well as practice teaching in English.	Lectures are conducted in English.
02EW010	Training in Medical Science Education	3	1.0	2, 3	Annual	by appointment		Chair of Biomedical Sciences, Research supervisors	In this subject, students firstly need to understand i) the objectives of the student education of this Doctoral Program, and ii) the role of each course toward achieving the objectives. Then, the students will join in iii) preparing the syllabus of a certain course together with supervisors, iv) give lecture in the course, and v) evaluate participants in the course. The students will be evaluated by the participants of the course which you will join in.	
02EW034	International Discussion on Medical Sciences I	2	2.0	1	SprABC	Fri1-3		Kenji Irie, Ryosuke Ohniwa	Focusing on molecular biology of the cell, International discussion on medical sciences I provides the opportunities for the students to have interactive online distance learning with the National Taiwan University and the Kyoto University, and to be engaged in thesis presentation and discussion conducted in English. In this course, the students should be able to understand basic knowledge of life sciences and acquire scientific communication skills in English.	
02EW035	International Discussion on Medical Sciences II	2	2.0	1	FallABC	Wed1-3		Kenji Irie, Ryosuke Ohniwa	Focusing on molecular cell biology and cancer biology, International discussion on medical sciences II provides the opportunities for the students to have interactive online distance learning with the National Taiwan University and the Kyoto University, and to be engaged in thesis presentation and discussion conducted in English. In this course, the students should be able to understand basic knowledge of life sciences and acquire scientific communication skills in English.	
02EW008	Advanced Seminar in Medical Sciences	1	3.0	1, 2	Annual	by appointment		Ken Nishimura, 生命システム医学専攻全教員	Students will attend lectures about the new concepts and technologies underlying research in the post-genome-era medical and biological sciences and will engage in discussions on their contents.	Lectures are conducted in Japanese
02EW009	Lecture on Critical Path Research Management	1	2.0	1, 2	FallABC	Mon6, 7	4F204	Masafumi Muratani	This course aims to equip students with an understanding of the process of critical path research and translational research, so as to translate basic research findings more quickly and efficiently into medical practice.	Lectures are conducted in English.
02EW036	Internship I	0	1.0	1 - 4	Annual	by appointment		Kazuya Morikawa	The goal of this course for students is to build up work consciousness and business ability, and to understand future roles expected for PhD students in Medical field.	
02EW038	Internship II	0	1.0	1 - 4	Annual	by appointment		Kazuya Morikawa	The goal of this course for students is to build up work consciousness and business ability, and to understand future roles expected for PhD students in Medical field.	

Course Num	Course Name	授業方法	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
02EW039	English Topics in Science I	2	1.0	1 - 4	SprAB	Tue4		Bryan James Mathis	To reinforce English vocabulary and fluency in discussing scientific concepts in a diverse array of research fields while introducing cutting edge technologies. Students will develop critical thinking and questioning skills for use in conferences, presentations and daily scientific work.	Conducted in the classroom Gakkei to 463. Lectures are conducted in English.
02EW040	English Topics in Science II	2	1.0	1 - 4	FallAB	Tue4		Bryan James Mathis	To reinforce English vocabulary and fluency in discussing scientific concepts in a diverse array of research fields while introducing cutting edge technologies. Students will develop critical thinking and questioning skills for use in conferences, presentations and daily scientific work.	Conducted in the classroom Gakkei to 463. Lectures are conducted in English.

Specialized Sciences

Course Num	Course Name	授業方法	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
02EW101	Lectures in Biomedical Research	1	1.0	1, 2	FallABC	by appointment		Chair of Biomedical Sciences, Research supervisors	To decide their future research direction and to finally prepare for publication of their research in a biomedical journal, students will study through practical discussion on the background, purpose, methods, results, discussion, and conclusions of ongoing research in each group.	Compulsory
02EW401	Lecture and Discussion in Molecular Medical Sciences I	1	2.0	1, 2	SprABC	by appointment		Kenji Irie, Koji Hisatake, Ken Nishimura, Norihiko Ohbayashi, Masayuki Masu, Satoru Takahashi, Yosuke Takei, Makoto Kobayashi, Shunsuke Ishii, Yukio Nakamura, Yasushi Saeki	To conduct research on development of prevention, diagnoses and treatments for human diseases, students should understand regulatory mechanisms of vital phenomena and pathogenic mechanisms at the individual and/or cellular levels based on concept of molecular biology. This lecture is aimed to take comprehensive knowledge required for research on Anatomy and Embryology, Molecular Cell Biology, Gene Regulation, Physiological Chemistry, Molecular Neurobiology, Molecular Behavioral Genetics, and Molecular Genetics through a presentation and discussion of the latest research results obtained in the affiliated laboratories.	
02EW402	Lecture and Discussion in Molecular Medical Sciences II	1	2.0	1, 2	FallABC	by appointment		Kenji Irie, Koji Hisatake, Ken Nishimura, Norihiko Ohbayashi, Masayuki Masu, Satoru Takahashi, Yosuke Takei, Makoto Kobayashi, Shunsuke Ishii, Yukio Nakamura, Yasushi Saeki	To conduct research on development of prevention, diagnoses and treatments for human diseases, students should understand regulatory mechanisms of vital phenomena and pathogenic mechanisms at the individual and/or cellular levels based on concept of molecular biology. This lecture is aimed to take comprehensive knowledge required for research on Anatomy and Embryology, Molecular Cell Biology, Gene Regulation, Physiological Chemistry, Molecular Neurobiology, Molecular Behavioral Genetics, and Molecular Genetics through a presentation and discussion of the latest research results obtained in the affiliated laboratories.	

Course Number	Course Name	授業方法	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
02EW403	Seminar in Molecular Medical Sciences I	2	2.0	1, 2	SprABC	by appointment		Kenji Irie, Koji Hisatake, Ken Nishimura, Norihiko Ohbayashi, Masayuki Masu, Satoru Takahashi, Yosuke Takei, Makoto Kobayashi, Shunsuke Ishii, Yukio Nakamura, Yasushi Saeki	This seminar is aimed to understand the purpose, methods, and results of latest articles related to Anatomy and Embryology, Reproductive Biochemistry, Molecular Cell Biology, Gene Regulation, Physiological Chemistry, Molecular Neurobiology, Molecular Behavioral Genetics, and Molecular Genetics. They also discuss the significances, problems, and future directions of the study.	
02EW404	Seminar in Molecular Medical Sciences II	2	2.0	1, 2	FallABC	by appointment		Kenji Irie, Koji Hisatake, Ken Nishimura, Norihiko Ohbayashi, Masayuki Masu, Satoru Takahashi, Yosuke Takei, Makoto Kobayashi, Shunsuke Ishii, Yukio Nakamura, Yasushi Saeki	This seminar is aimed to understand the purpose, methods, and results of latest articles related to Anatomy and Embryology, Reproductive Biochemistry, Molecular Cell Biology, Gene Regulation, Physiological Chemistry, Molecular Neurobiology, Molecular Behavioral Genetics, and Molecular Genetics. They also discuss the significances, problems, and future directions of the study.	
02EW405	Practice in Molecular Medical Sciences I	3	2.0	1, 2	SprABC	by appointment		Kenji Irie, Koji Hisatake, Ken Nishimura, Norihiko Ohbayashi, Masayuki Masu, Satoru Takahashi, Yosuke Takei, Makoto Kobayashi, Shunsuke Ishii, Yukio Nakamura, Yasushi Saeki	This course is aimed to learn the principles and methods of experiments and analysis for research on Anatomy and Embryology, Molecular Cell Biology, Gene Regulation, Physiological Chemistry, Molecular Neurobiology, Molecular Behavioral Genetics, and Molecular Genetics.	
02EW406	Practice in Molecular Medical Sciences II	3	2.0	1, 2	FallABC	by appointment		Kenji Irie, Koji Hisatake, Ken Nishimura, Norihiko Ohbayashi, Masayuki Masu, Satoru Takahashi, Yosuke Takei, Makoto Kobayashi, Shunsuke Ishii, Yukio Nakamura, Yasushi Saeki	This course is aimed to learn the principles and methods of experiments and analysis for research on Anatomy and Embryology, Molecular Cell Biology, Gene Regulation, Physiological Chemistry, Molecular Neurobiology, Molecular Behavioral Genetics, and Molecular Genetics.	

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02EW411	Lecture and Discussion in Human Medical Biology I	1	2.0	1, 2	SprABC	by appointment		Mitsuyasu Kato, Peter ten Dijke, Fumihiro Sugiyama, Seiya Mizuno, Masayuki Noguchi, Michio Nagata, Akira Shibuya, Kazuko Shibuya, Osamu Ohneda, Hirotooshi Miyoshi, Atsushi Kawaguchi, Kazuya Morikawa, Kiong Ho, Tadachika Koganezawa, Takeji Sakae, Hiromi Yanagisawa, Masayuki Matsumoto	Students conduct molecular biological and biotechnological research approach to understand regulatory mechanisms of biological phenomena and pathogenic processes of human being at the individual and/or cellular levels. In this subject, students give presentations on their own research and have discussion on research achievement and future plan. Students are required to attend the classes organized by multiple faculties including their own research supervisor. The research fields involved in this subject are, experimental pathology, cancer signaling, animal models for human disease, diagnostic pathology, kidney and vascular pathology, Immunology, regenerative medicine, radiation life science, medical physics, infection biology, neurophysiology, cognitive and behavioral neuroscience, biomedical engineering, and vascular biology.	
02EW412	Lecture and Discussion in Human Medical Biology II	1	2.0	1, 2	FallABC	by appointment		Mitsuyasu Kato, Peter ten Dijke, Fumihiro Sugiyama, Seiya Mizuno, Masayuki Noguchi, Michio Nagata, Akira Shibuya, Kazuko Shibuya, Osamu Ohneda, Hirotooshi Miyoshi, Atsushi Kawaguchi, Kazuya Morikawa, Kiong Ho, Tadachika Koganezawa, Takeji Sakae, Hiromi Yanagisawa, Masayuki Matsumoto	Students conduct molecular biological and biotechnological research approach to understand regulatory mechanisms of biological phenomena and pathogenic processes of human being at the individual and/or cellular levels. In this subject, students give presentations on their own research and have discussion on research achievement and future plan. Students are required to attend the classes organized by multiple faculties including their own research supervisor. The research fields involved in this subject are, experimental pathology, cancer signaling, animal models for human disease, diagnostic pathology, kidney and vascular pathology, Immunology, regenerative medicine, radiation life science, medical physics, infection biology, neurophysiology, cognitive and behavioral neuroscience, biomedical engineering, and vascular biology.	

Course Num	Course Name	授業方法	Credits	Standard Academic Year	Course Offering Term	Weekday and Period	Classroom	Instructor	Course Overview	Remarks
02EW413	Seminar in Human Medical Biology I	2	2.0	1, 2	SprABC	by appointment		Mitsuyasu Kato, Peter ten Dijke, Fumihiro Sugiyama, Seiya Mizuno, Masayuki Noguchi, Michio Nagata, Akira Shibuya, Kazuko Shibuya, Osamu Ohneda, Hirotooshi Miyoshi, Atsushi Kawaguchi, Kazuya Morikawa, Kiong Ho, Tadachika Koganezawa, Takeji Sakae, Hiromi Yanagisawa, Masayuki Matsumoto	This seminar is aimed to understand the purpose, methods, and results of latest articles. The research fields involved in this subject are, experimental pathology, cancer signaling, animal models for human disease, diagnostic pathology, kidney and vascular pathology, Immunology, regenerative medicine, radiation life science, medical physics, infection biology, neurophysiology, cognitive and behavioral neuroscience, biomedical engineering, and vascular biology.	
02EW414	Seminar in Human Medical Biology II	2	2.0	1, 2	FallABC	by appointment		Mitsuyasu Kato, Peter ten Dijke, Fumihiro Sugiyama, Seiya Mizuno, Masayuki Noguchi, Michio Nagata, Akira Shibuya, Kazuko Shibuya, Osamu Ohneda, Hirotooshi Miyoshi, Atsushi Kawaguchi, Kazuya Morikawa, Kiong Ho, Tadachika Koganezawa, Takeji Sakae, Hiromi Yanagisawa, Masayuki Matsumoto	This seminar is aimed to understand the purpose, methods, and results of latest articles. The research fields involved in this subject are, experimental pathology, cancer signaling, animal models for human disease, diagnostic pathology, kidney and vascular pathology, Immunology, regenerative medicine, radiation life science, medical physics, infection biology, neurophysiology, cognitive and behavioral neuroscience, biomedical engineering, and vascular biology.	

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02EW415	Practice in Human Medical Biology I	3	2.0	1, 2	SprABC	by appointment		Mitsuyasu Kato, Peter ten Dijke, Fumihiro Sugiyama, Seiya Mizuno, Masayuki Noguchi, Michio Nagata, Akira Shibuya, Kazuko Shibuya, Osamu Ohneda, Hirotooshi Miyoshi, Atsushi Kawaguchi, Kazuya Morikawa, Kiong Ho, Tadachika Koganezawa, Takeji Sakae, Hiromi Yanagisawa, Masayuki Matsumoto	This course is aimed to learn the principles and methods of experiments and analysis for research. The research fields involved in this subject are, experimental pathology, cancer signaling, animal models for human disease, diagnostic pathology, kidney and vascular pathology, Immunology, regenerative medicine, radiation life science, medical physics, infection biology, neurophysiology, cognitive and behavioral neuroscience, biomedical engineering, and vascular biology.	
02EW416	Practice in Human Medical Biology II	3	2.0	1, 2	FallABC	by appointment		Mitsuyasu Kato, Peter ten Dijke, Fumihiro Sugiyama, Seiya Mizuno, Masayuki Noguchi, Michio Nagata, Akira Shibuya, Kazuko Shibuya, Osamu Ohneda, Hirotooshi Miyoshi, Atsushi Kawaguchi, Kazuya Morikawa, Kiong Ho, Tadachika Koganezawa, Takeji Sakae, Hiromi Yanagisawa, Masayuki Matsumoto	This course is aimed to learn the principles and methods of experiments and analysis for research. The research fields involved in this subject are, experimental pathology, cancer signaling, animal models for human disease, diagnostic pathology, kidney and vascular pathology, Immunology, regenerative medicine, radiation life science, medical physics, infection biology, neurophysiology, cognitive and behavioral neuroscience, biomedical engineering, and vascular biology.	

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02EW421	Lecture and Discussion in Genome and Environmental Medicine I	1	2.0	1, 2	SprABC	by appointment		Naoyuki Tsuchiya, Emiko Noguchi, Masafumi Muratani, Yoshito Kumagai, Ichiyo Matsuzaki, Katsuya Honda, Haruka Ozaki, Tokie Anme, Shigeyuki Kano, Yoshimasa Takahashi	<p>In this course, each laboratory opens a series of classes in which how to design and conduct research and interpret the findings is discussed. The topics covered in this course include genomic factors, environmental factors and their interactions involved in diseases, as well as human adaptation to environment and its medical significance. The students are requested to present their own research plans and findings, followed by discussion by staff members and all attending students. In some laboratories, lectures pertinent to these issues will be given.</p> <p>Each student is required to attend the classes given by his/her research supervisor, as well as at least one series of classes given by other laboratories belonging to the Doctoral Program in Biomedical Sciences (not restricted to the laboratories who hold the lectures for the genome and environmental medicine). Attendance at 20 classes is required to earn 2 credits each semester.</p> <p>Please be sure to contact the responsible faculty members when attending the lectures held by laboratories other than yours, and to submit a required form to the Majors of Medical Sciences administration office by the deadline.</p>	
02EW422	Lecture and Discussion in Genome and Environmental Medicine II	1	2.0	1, 2	FallABC	by appointment		Naoyuki Tsuchiya, Emiko Noguchi, Masafumi Muratani, Yoshito Kumagai, Ichiyo Matsuzaki, Katsuya Honda, Haruka Ozaki, Tokie Anme, Shigeyuki Kano, Yoshimasa Takahashi	<p>In this course, each laboratory opens a series of classes in which how to design and conduct research and interpret the findings is discussed. The topics covered in this course include genomic factors, environmental factors and their interactions involved in diseases, as well as human adaptation to environment and its medical significance. The students are requested to present their own research plans and findings, followed by discussion by staff members and all attending students. In some laboratories, lectures pertinent to these issues will be given.</p> <p>Each student is required to attend the classes given by his/her research supervisor, as well as at least one series of classes given by other laboratories belonging to the Doctoral Program in Biomedical Sciences (not restricted to the laboratories who hold the lectures for the genome and environmental medicine). Attendance at 20 classes is required to earn 2 credits each semester.</p> <p>Please be sure to contact the responsible faculty members when attending the lectures held by laboratories other than yours, and to submit a required form to the Majors of Medical Sciences administration office by the deadline.</p>	

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02EW423	Seminar in Genome and Environmental Medicine I	2	2.0	1, 2	SprABC	by appointment		Naoyuki Tsuchiya, Emiko Noguchi, Masafumi Muratani, Yoshito Kumagai, Ichiyo Matsuzaki, Katsuya Honda, Haruka Ozaki, Tokie Anme, Shigeyuki Kano, Yoshimasa Takahashi	<p>In this course, each laboratory opens a series of seminars in which students present and critically discuss latest scientific papers related to their research interest. The topics covered in this course include genomic factors, environmental factors and their interactions involved in diseases, as well as human adaptation to environment and its medical significance. In the Laboratory of Public Health Medicine, the students actually participate in the preventive medicine activities in the community (optional). Each student is required to attend the seminars given by his/her research supervisor, as well as at least one series of seminars given by other staff members belonging to the Doctoral Program in Biomedical Sciences (not restricted to the laboratories who hold the seminars for the genome and environmental medicine). Attendance at 20 seminars is required to earn 2 credits each semester.</p> <p>Please be sure to contact the responsible faculty members when attending the seminars held by laboratories other than yours, and to submit a required form to the Majors of Medical Sciences administration office by the deadline.</p>	
02EW424	Seminar in Genome and Environmental Medicine II	2	2.0	1, 2	Fall IABC	by appointment		Naoyuki Tsuchiya, Emiko Noguchi, Masafumi Muratani, Yoshito Kumagai, Ichiyo Matsuzaki, Katsuya Honda, Haruka Ozaki, Tokie Anme, Shigeyuki Kano, Yoshimasa Takahashi	<p>In this course, each laboratory opens a series of seminars in which students present and critically discuss latest scientific papers related to their research interest. The topics covered in this course include genomic factors, environmental factors and their interactions involved in diseases, as well as human adaptation to environment and its medical significance. In the Laboratory of Public Health Medicine, the students actually participate in the preventive medicine activities in the community (optional). Each student is required to attend the seminars given by his/her research supervisor, as well as at least one series of seminars given by other staff members belonging to the Doctoral Program in Biomedical Sciences (not restricted to the laboratories who hold the seminars for the genome and environmental medicine). Attendance at 20 seminars is required to earn 2 credits each semester.</p> <p>Please be sure to contact the responsible faculty members when attending the seminars held by laboratories other than yours, and to submit a required form to the Majors of Medical Sciences administration office by the deadline.</p>	

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02EW425	Practice in Genome and Environmental Medicine I	3	2.0	1, 2	SprABC	by appointment		Naoyuki Tsuchiya, Emiko Noguchi, Yoshito Kumagai, Katsuya Honda, Masafumi Muratani, Haruka Ozaki, Yoshimasa Takahashi	<p>In this course, each laboratory opens a workshop on basic principles and methods in experimental or laboratory analyses related to the genomic factors, environmental factors and their interactions.</p> <p>Each student is required to attend the workshop given by his/her research supervisor. In addition, he/she can take other workshop(s) given by other laboratories belonging to the Doctoral Program in Biomedical Sciences.</p> <p>Please be sure to contact the responsible faculty members when attending the workshops held by laboratories other than yours, and to submit a required form to the Majors of Medical Sciences administration office by the deadline.</p>	
02EW426	Practice in Genome and Environmental Medicine II	3	2.0	1, 2	FallABC	by appointment		Naoyuki Tsuchiya, Emiko Noguchi, Masafumi Muratani, Yoshito Kumagai, Katsuya Honda, Haruka Ozaki, Yoshimasa Takahashi	<p>In this course, each laboratory opens a workshop on basic principles and methods in experimental or laboratory analyses related to the genomic factors, environmental factors and their interactions.</p> <p>Each student is required to attend the workshop given by his/her research supervisor. In addition, he/she can take other workshop(s) given by other laboratories belonging to the Doctoral Program in Biomedical Sciences.</p> <p>Please be sure to contact the responsible faculty members when attending the workshops held by laboratories other than yours, and to submit a required form to the Majors of Medical Sciences administration office by the deadline.</p>	
02EW431	Lecture and Discussion in Medical Science of Sleep I	1	2.0	1, 2	SprABC	by appointment		Masashi Yanagisawa, Takeshi Sakurai, Arisa Hirano, Hiroshi Nagase, Noriki Kutsumura, Qinghua Liu, Masanori Sakaguchi, Michael Lazarus, Yu Hayashi, Sakiko Honjoh, Kaspar Vogt	<p>To conduct research on development of prevention, diagnoses and treatments for human diseases, students should understand regulatory mechanisms of vital phenomena and pathogenic mechanisms at the individual and/or cellular levels based on concept of molecular biology.</p> <p>This lecture is aimed to take comprehensive knowledge required for research on Molecular Pharmacology, Functional neuroanatomy, Medicinal Chemistry, Organic Chemistry, Biochemistry /Chemical Biology /Genetics, Sleep and Memory, Systems Pharmacology, Molecular sleep biology, and medical physics through a presentation and discussion of the latest research results obtained in the affiliated laboratories.</p>	
02EW432	Lecture and Discussion in Medical Science of Sleep II	1	2.0	1, 2	FallABC	by appointment		Masashi Yanagisawa, Takeshi Sakurai, Arisa Hirano, Hiroshi Nagase, Noriki Kutsumura, Qinghua Liu, Masanori Sakaguchi, Michael Lazarus, Yu Hayashi, Sakiko Honjoh, Kaspar Vogt	<p>To conduct research on development of prevention, diagnoses and treatments for human diseases, students should understand regulatory mechanisms of vital phenomena and pathogenic mechanisms at the individual and/or cellular levels based on concept of molecular biology.</p> <p>This lecture is aimed to take comprehensive knowledge required for research on Molecular Pharmacology, Functional neuroanatomy, Medicinal Chemistry, Organic Chemistry, Biochemistry /Chemical Biology /Genetics, Sleep and Memory, Systems Pharmacology, Molecular sleep biology, and medical physics through a presentation and discussion of the latest research results obtained in the affiliated laboratories.</p>	

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02EW433	Seminar in Medical Science of Sleep I	2	2.0	1, 2	SprABC	by appointment		Masashi Yanagisawa, Takeshi Sakurai, Arisa Hirano, Hiroshi Nagase, Noriki Kutsumura, Qinghua Liu, Masanori Sakaguchi, Yu Hayashi, Michael Lazarus, Sakiko Honjoh, Kaspar Vogt	This seminar is aimed to understand the purpose, methods, and results of latest articles related to Molecular Pharmacology, Functional neuroanatomy, Medicinal Chemistry, Organic Chemistry, Biochemistry /Chemical Biology /Genetics, Sleep and Memory, Systems Sleep Biology, Molecular sleep biology. They also discuss the significances, problems, and future directions of the study.	
02EW434	Seminar in Medical Science of Sleep II	2	2.0	1, 2	FallABC	by appointment		Masashi Yanagisawa, Takeshi Sakurai, Arisa Hirano, Hiroshi Nagase, Noriki Kutsumura, Qinghua Liu, Masanori Sakaguchi, Michael Lazarus, Yu Hayashi, Sakiko Honjoh, Kaspar Vogt	This seminar is aimed to understand the purpose, methods, and results of latest articles related to Molecular Pharmacology, Functional neuroanatomy, Medicinal Chemistry, Organic Chemistry, Biochemistry /Chemical Biology /Genetics, Sleep and Memory, Systems Sleep Biology, Molecular sleep biology. They also discuss the significances, problems, and future directions of the study.	
02EW435	Practice in Medical Science of Sleep I	3	2.0	1, 2	SprABC	by appointment		Masashi Yanagisawa, Takeshi Sakurai, Arisa Hirano, Hiroshi Nagase, Noriki Kutsumura, Qinghua Liu, Masanori Sakaguchi, Michael Lazarus, Yu Hayashi, Sakiko Honjoh, Kaspar Vogt	This course is aimed to learn the principles and methods of experiments and analysis for research on Molecular Pharmacology, Functional neuroanatomy, Medicinal Chemistry, Organic Chemistry, Biochemistry /Chemical Biology /Genetics, Sleep and Memory, Systems Pharmacology and Molecular sleep biology.	
02EW436	Practice in Medical Science of Sleep II	3	2.0	1, 2	FallABC	by appointment		Masashi Yanagisawa, Takeshi Sakurai, Arisa Hirano, Hiroshi Nagase, Noriki Kutsumura, Qinghua Liu, Sakiko Honjoh, Masanori Sakaguchi, Michael Lazarus, Kaspar Vogt, Yu Hayashi	This course is aimed to learn the principles and methods of experiments and analysis for research on Molecular Pharmacology, Functional neuroanatomy, Medicinal Chemistry, Organic Chemistry, Biochemistry /Chemical Biology /Genetics, Sleep and Memory, Systems Pharmacology and Molecular sleep biology.	