

Tokyo Medical and Dental University

Graduate School of Medical and Dental Sciences

Medical and Dental Science and Technology

Master's Program

Disease Prevention Global Leader Program

2017-18 BULLETIN

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Human Resource Development Goals

This course is rooted in a systematic curriculum developed through the fusion of numerous fields, with the primary focus on medicine, dentistry, and life science and technology. The goals of the course are to inspire mutual cooperation in the various domains of life sciences and to cultivate capable educators, researchers, technicians, and other professionals in medicine, dentistry, and life science and technology who bring extensive knowledge and high ethical standards on regarding human health and welfare to their work.

The In detail, the Master's of Medical Administration Management Policy Course strives to effectively address today's social needs pertaining to medical services, based on studies a course of the syllabus structured to develop professionals who will excel in positions of leadership. Specifically, the course is designed to train individuals who will help establish social systems that supply increasingly efficient and superior patient-focused health care in through the fields of medical administration and policy.

Application for Degree Conditions for Completion and Method for Taking Courses

1. Conditions for completion

A student must attend this Master's Program for at least two years, acquire at least 30 units, and pass the master's thesis exam (open to the public) and the final examination.

2. How to take courses

The method to obtain 30 units on this Master's Program is as follows:

1) A student must obtain 16 units in compulsory subjects ("Philosophy of Medicine and Dentistry", "Initial Research Training", "Special Lectures for Advanced Research on Life Science and Technology", "Research for Thesis", "Seminar of Science and Engineering", "Practice of Science and Engineering"), obtain at least 14 units in electives.

A student (degree: Engineering) must obtain at least 4 units in subjects below ("Introduction to Chemistry and Biology of Biofunctional Molecules", "Chemical Biology", "Practical Chemical Biology", "Special Lectures on Molecular Structures", "Advanced Biomaterials Science", "Applied Biomaterials", "Biomedical Device Science and Engineering", "Biomedical System Science and Engineering").

2) In selecting subjects, a student must carefully read the syllabus and complete the procedures to sign up for a course after consulting with your supervisor.

3) Guidance counselor

A student who plans to take a master degree of Science or Engineering must determine a responsible guidance counselor and an assistant research guidance counselor. (Assistant research guidance counselor is not necessary for the student who plans to take other master degree.)

Responsible guidance counselor: professor, associate professor or lecture in Graduate School of Medical and Dental Sciences.

Assistant research guidance counselor: professor, associate professor, lecture, or assistant professor in a different department from that of responsible guidance counselor.

* One of two guidance counselors for a student who plans to take a master degree of Science or Engineering must belong to Life Science and Technology Track.

List of the Courses

Core courses

Course Titles	Units	Note
3001: Philosophy of Medicine and Dentistry	2	Offered in fall 2018
3102: Initial Research Training	1	Offered in spring 2018
3003: Special Lectures for Advanced Research on Life Science and Technology	1	
3004: Research for Thesis	4	
3011: Seminar of Science and Engineering	4	
3012: Practice of Science and Engineering	4	

Electives

3022: Immunology	2	Offered in fall 2018
3023: Developmental and Regenerative Bioscience	2	Offered in fall 2017
3025: Introduction to Medical Neurosciences	2	Offered in fall 2018
3029: Disease OMICS Informatics	2	Offered in fall 2017
3030: Introduction to Chemistry and Biology of Biofunctional Molecules	2	Offered in fall 2018
3031: Chemical Biology	2	Offered in fall 2017
3032: Practical Chemical Biology	2	Offered in spring 2018
3033: Special Lectures on Molecular Structures	2	Offered in fall 2017
3034: Advanced Biomaterials Science	2	Offered in fall 2017
3036: Applied Biomaterials	2	Offered in fall 2017
3035: Biomedical Device Science and Engineering	2	Offered in fall 2018
3044: Biomedical System Science and Engineering	2	Offered in fall 2018
3040: Translational Research	2	Offered in fall 2017

Time Table for the Fall Regular Classes

Date	1 8:50~10:20	2 10:30~12:00	3 13:00~14:30	4 14:40~16:10	5 16:20~17:50	6 18:00~19:30	7 19:40~21:10
10月17日 Tue			3029 : Disease OMICS Informatics 1 / 2 ◇				
10月18日 Wed							
10月19日 Thu							
10月20日 Fri							
10月21日 Sat							
10月22日 Sun							
10月23日 Mon							
10月24日 Tue			3029 : Disease OMICS Informatics 3 ◇	3029 : Disease OMICS Informatics 4 ♣			
10月25日 Wed			3034 : Advanced Biomaterials Science 1 / 2 ◆				
10月26日 Thu	3034 : Advanced Biomaterials Science 3 / 4 ◆		3029 : Disease OMICS Informatics 5 ♣	3029 : Disease OMICS Informatics 6 ◇			
10月27日 Fri			3029 : Disease OMICS Informatics 7 □	3029 : Disease OMICS Informatics 8 ♣	3034 : Advanced Biomaterials Science 5 ◆		
10月28日 Sat							
10月29日 Su							
10月30日 Mon			3029 : Disease OMICS Informatics 9 / 10 ◇		3040 : Translational Research 1 / 2 ◆		
10月31日 Tue				3029 : Disease OMICS Informatics 11 / 12 □			
11月1日 Wed			3029 : Disease OMICS Informatics 13 / 14 / 15 □				
11月2日 Thu				3034 : Advanced Biomaterials Science 6 / 7 ◆			
11月3日 Fri							
11月4日 Sat							
11月5日 Su							
11月6日 Mon					3040 : Translational Research 3 / 4 ◆		
11月7日 Tue			3031 : Chemical Biology 1 ◆		3034 : Advanced Biomaterials Science 8 ◆		
11月8日 Wed			3031 : Chemical Biology 2 / 3 ◆		3034 : Advanced Biomaterials Science 9 ◆		
11月9日 Thu	3034 : Advanced Biomaterials Science 10 / 11 ◆		3031 : Chemical Biology 4 / 5 ◆				
11月10日 Fri			3031 : Chemical Biology 6 / 7 ◆		3034 : Advanced Biomaterials Science 12 ◆		
11月11日 Sat							
11月12日 Su							
11月13日 Mon					3040 : Translational Research 5 / 6 ◆		
11月14日 Tue				3031 : Chemical Biology 8 / 9 ◆			
11月15日 Wed				3031 : Chemical Biology 10 / 11 ◆			
11月16日 Thu	3034 : Advanced Biomaterials Science 13 / 14 ◆		3031 : Chemical Biology 12 / 13 ◆				
11月17日 Fri					3034 : Advanced Biomaterials Science 15 ◆		
11月18日 Sat							
11月19日 Su							
11月20日 Mon				3031 : Chemical Biology 14 / 15 ◆			
11月21日 Tue							
11月22日 Wed							
11月23日 Thu							
11月24日 Fri			3034 : Applied Biomaterials 1 / 2 ◆				
11月25日 Sat							
11月26日 Sun							
11月27日 Mon	3023 : Developmental and Regenerative Bioscience 1 / 2 ◇		3033 : Special Lectures on Molecular Structures 1 / 2 ◇		3036 : Applied Biomaterials 3 ◆		
11月28日 Tue	3023 : Developmental and Regenerative Bioscience 3 / 4 ◇		3033 : Special Lectures on Molecular Structures 3 / 4 ◇		3036 : Applied Biomaterials 4 ◆		
11月29日 Wed	3023 : Developmental and Regenerative Bioscience 5 / 6 ◇		3033 : Special Lectures on Molecular Structures 5 / 6 ◇		3036 : Applied Biomaterials 5 ◆		
11月30日 Thu	3023 : Developmental and Regenerative Bioscience 7 / 8 ◇		3033 : Special Lectures on Molecular Structures 7 / 8 ◇		3036 : Applied Biomaterials 6 ◆		
12月1日 Fri	3023 : Developmental and Regenerative Bioscience 9 / 10 ◇		3033 : Special Lectures on Molecular Structures 9 / 10 ◇		3036 : Applied Biomaterials 7 ◆		
12月2日 Sat							
12月3日 Su							
12月4日 Mon	3023 : Developmental and Regenerative Bioscience 11 / 12 ◇		3033 : Special Lectures on Molecular Structures 11 / 12 ◇		3036 : Applied Biomaterials 8 ◆		
12月5日 Tue	3023 : Developmental and Regenerative Bioscience 13 / 14 ◇		3033 : Special Lectures on Molecular Structures 13 / 14 ◇		3036 : Applied Biomaterials 9 ◆		
12月6日 Wed	3023 : Developmental and Regenerative Bioscience 15 ◇	3033 : Special Lectures on Molecular Structures 15 ◇		3036 : Applied Biomaterials 10 / 11 ◆			
12月7日 Thu	3036 : Applied Biomaterials 12 / 13 ◆						
12月8日 Fri	3036 : Applied Biomaterials 14 / 15 ◆						
12月9日 Sat							
12月10日 Su							
12月11日 Mon							
12月12日 Tue			3031 : Chemical Biology □ (Exam)	3034 : Advanced Biomaterials Science ◆ (Exam)			
12月13日 Wed			3033 : Special Lectures on Molecular Structures □ (Exam)	3036 : Applied Biomaterials (Exam) □			
12月14日 Thu							
12月15日 Fri							

◇ : 6F, Building 3 ♣ : Information Retrieval room, Library, 4F, M&D Tower □ : 21F, M&D Tower ◆ : Meeting room 2, 1F Building 22

Philosophy of Medicine and Dentistry

[Instructor(s)]

Dr. Hiroyuki Kagechika
Building 21, 6 th floor, Ext. 8032,
E-mail: kage.chem@tmd.ac.jp

[Classroom/Lab] Next Page

[Course Purpose] The course teaches the fundamental biology, chemistry and engineering for students who may have various academic backgrounds.

[Outline] Knowledge of a wide range of bio-related science is needed to fully understand and utilize results of latest biosciences. This series of lectures cover basic ideas of molecular biology, protein chemistry, organic chemistry and bioengineering, and is expected to widen intellectual horizons of students and improve their understanding the complex nature of current biosciences.

[Course Objective(s)]

Students who may have various academic backgrounds to acquire a certain level of understanding of biology, chemistry and engineering, which will be helpful in research of life science and technology and in social activities after graduation.

[Format] Lecture

[Course Description and Timetable]

[No.1] Cell organelles

In this lecture, students learn overview of a typical animal cell and plant cell and their major substructures.

[No.2] Gene Expression in Eukaryotes

Each cell of a multicellular organism has a complete set of genes, yet only a subset of genes are active and produce functional proteins. In this lecture, students learn basic molecular mechanisms of gene expression and a variety of regulation mechanisms in eukaryotes.

[No.3] Signal transduction

The mechanisms of intracellular signal transduction are conserved in development of organisms. In this lecture, students learn the molecular mechanisms of signal transduction networks that control various biological regulatory systems in *Drosophila*, *Xenopus*, and mammalian cultured cells.

[No.4] Genetics and epigenetics

Both genetics and epigenetics are fundamentals of biology and medical science. In this lecture, students learn how biological phenomenon, such as development, differentiation, morphogenesis and evolution, are determined and regulated in terms of genetic and epigenetic mechanisms.

[No.5] Structural and functional properties of glycans and lectins

In this lecture, students learn overview of glycans and lectins.

[No.6] Proteins: Their structures and functions

Proteins are essential machinery for life. Their chemical and physical features are discussed in the lecture. Some experimental methods to elucidate their functions are also explained.

[No.7] Fundamental organic chemistry

In this lecture, students learn the principles of structures and reactions of organic molecules, which are important to understand the biological phenomenon at molecular level and to develop biofunctional molecules.

[No.8] Organic chemistry for biology

In this lecture, students learn the fundamentals of organic chemistry important to understand biology.

[No.9] Fundamental medicinal chemistry

In this lecture, students learn the fundamentals of medicinal chemistry important to drug discovery, including small drugs, mid-size drugs and biologics.

[No.10] Materials science I

Materials science provides the general information of metals, ceramics and polymers. Materials science I treats polymeric materials mainly. Topic includes polymer synthesis, viscoelasticity of polymers, and functions of polymers.

[No.11] Materials science II

Materials science II treats metals and ceramics. Topics include atomic structure and atomic arrangement of materials, crystal and amorphous state, melting point and glass transition temperature, mechanical and chemical properties of metal and ceramics.

[No.12] Colloid and interface science

Colloid and interface science is important to understand the biological reaction to biomaterials and to fabricate functional biomaterials, such as DDS, implantable devices and so on.

[No.13] Mechanics for biological systems

In this lecture, students learn the biological systems from the view point of physical science and basic mechanics.

[No.14] Biomedical sensing

Electronics and sensing treats the fundamental topic to understand the electrical medical devices and sensing devices.

[No.15] Electrochemistry and bioelectronics

Students learn physical and chemical properties at the interface between liquid and solid, and their application to selective capture of biomolecules at the surface of solid materials, interaction with biomolecules and cells, and signal generation and transduction at the solid/liquid interface.

[Grading System] Attendance

[Prerequisite Reading] It is recommended that one refers to the textbook (below) before the lecture.

[Reference Materials] Molecular Cell Biology, Harvey Lodish etc, 8th edition, W H Freeman & Co; Molecular Biology of the Cell, Bruce Alberts etc, 6th edition, Garland Science; Fundamentals of Organic Chemistry, John McMurry & Eric Simanek, 6th edition, Brooks/Cole Pub Co.

[Important Course Requirements] None

[Office hours]

Oct 12 - Oct 27, 15:00-17:00

Hiroyuki Kagechika, kage.chem@tmd.ac.jp

Rm 609A, Floor 6, Bldg 21

[Note(s) to students] None

Schedule

The lecture will be scheduled in second half of 2018, which will be announced in April, 2018.

Initial Research Training

[Chief Instructor] Dr. Izumi Sugihara
Building 3, 14F, Ext. 5152,
E-mail: isugihara.phy1@tmd.ac.jp

[Course Description] Research work should be done in accordance with various rules and regulations including those related to ethics, and those related to handling of toxic substances, radioactive materials and animals. This series of lectures introduce rules and regulations that the students should follow during research work. Also, the students learn how to use libraries and data bases, and how to avoid scientific misconducts.

[Units] One (Master)

[Format] Lecture

[Grading] Attendance

[Course Schedule] The lectures will be scheduled in second first half of 2018, which will be announced in March, 2018.

Special Lectures for Advanced Research on Life Science and Technology

[Instructor(s)]

Dr. Izumi Sugihara (Chairman of the Master Course Education Committee)

Contact: Educational Planning Section,

TEL:03-5803-4534、 Email: grad02@ml.tmd.ac.jp

[Classroom/Lab] Mainly at lecture rooms in TMDU. Announced beforehand.

[Course Purpose] This course requires students to attend lectures and seminars in which top scientists inside and outside TMDU talk, learn leading advances in research fields, and join in academic discussion.

[Outline] Students register and attend the research seminars (listed below) held at our university and presented by invited speakers. These seminars should provide students with exposure to forefront research covering a wide range of topic areas from experts in their discipline.

[Course Objective(s)]

Students have to attend eight or more registered lectures and seminars. Learn advances in research fields, which will be helpful in research for thesis and research, and social activities after graduation.

[Format] Attending lectures and seminars that are announced in advance.

[Course Description and Timetable]

Lectures and seminars that are registered for this course includes:

Graduate School Special Lectures:

Graduate School Seminars:

Medical Research Institute Seminars:

Medical Dental Engineering Institute Seminars:

Each lecture and seminar is announced in the poster and the TMDU home page on the following URL.

Other seminars can be registered in this course if the supervisor apply for it.

1) Graduate School Special Lecture, 2) Graduate School Seminar

※ 「がんプロ」「ボーダレス」 seminars are NOT countable.

【URL】 http://www.tmd.ac.jp/faculties/graduate_school/seminar/index.html

3) Medical Research Institute (MRI) Seminar

【URL】 <http://www.tmd.ac.jp/mri/events/index.html>

4) Institute of Biomaterials and Bioengineering (IBB) Seminar

【URL】 <http://www.tmd.ac.jp/i-mde/www/event/index.html>

[Grading System] Students who attend eight or more lectures and seminars are evaluated. The number of seminars and lectures (exceeding eight) that a student attends (20 %), and student's discussion during the seminar (if he/she says something in the seminar) (20 %) are considered.

[Prerequisite Reading] Refer to the announcement of each lecture and seminar.

[Reference Materials] Refer to the announcement of each lecture and seminar.

[Important Course Requirements] Attend all lectures in the first one year. It is preferable to attend lectures and seminars in a wide range of research fields. Get a signature of the host of the lecture or seminar in the attendance record form each time a student attends it. If you speak something during the seminar, write down your remarks in the "comment" area of the attendance record form and get a signature of the host of the lecture. Submit the attendance record form by the end of July of the first one year to the education office.

[Office hours]

Refer to the announcement of each lecture and seminar.

[Note(s) to students] (none)

Research for Thesis

[Instructor(s)]

The supervisor (and the vice supervisor)

[Classroom/Lab] To be specified by the supervisor(s)

[Course Purpose] Students are supposed to learn what research is in the medical, dental, bioscientific or engineering fields and to acquire basic ability to perform research.

[Outline] Research subject is determined in the field of medical, dental, bioscience and bioengineering through discussion with the supervisors. Students actively participate in their research projects to acquire techniques and the ability/skill for assessing the research subject by themselves.

[Course Objective(s)]

To create a research project, form a research plan, perform research, revise the research plan, summarize the research product, and finalize the thesis.

[Format] To be specified by the supervisor(s)

[Course Description and Timetable] To be specified by the supervisor(s)

[Grading System] Comprehensive grading based on the thesis paper and other achievements

[Prerequisite Reading] To be specified by the supervisor(s)

[Reference Materials] To be specified by the supervisor(s)

[Important Course Requirements] To be specified by the supervisor(s)

[Office hours] To be specified by the supervisor(s)

[Note(s) to students] This course is required for all students. Please read the article “Application for degree” in this guide book for further information on the policies and regulations of the Graduate School.

Seminar of Science and Engineering

[Instructor(s)]

The supervisor (and the vice supervisor)

[Classroom/Lab] To be specified by the supervisor(s)

[Course Purpose] The course teaches presentation skill, communication skill, information-gathering skill, literature-searching skill, and logical thinking skill, which are necessary in master course research in Science and Engineering, by attending small-group seminars run by the supervisor(s).

[Outline] Students attend laboratory seminars and meetings under the guidance of supervisors to acquire the basic research ability in Science and Engineering.

[Course Objective(s)]

A student is supposed to acquire presentation skill, communication skill, information-gathering skill, literature-searching skill, and logical thinking skill, which are necessary in master course research in Science and Engineering.

[Format] Practical training in laboratory seminars and meetings under the guidance of supervisors or other staff in the department in man-to-man or a small-group environment.

[Course Description and Timetable]

To be specified by the supervisor(s)

[Grading System] To be specified by the supervisor(s)

[Prerequisite Reading] To be specified by the supervisor(s)

[Reference Materials] To be specified by the supervisor(s)

[Important Course Requirements] To be specified by the supervisor(s)

[Office hours] To be specified by the supervisor(s)

[Note(s) to students] (None)

Practice of Science and Engineering

[Instructor(s)]

The supervisor (and the vice supervisor)

[Classroom/Lab] To be specified by the supervisor(s)

[Course Purpose] The course teaches practical research methods, techniques, equipment-handling, data analysis and problem-solving, which are necessary in master course research in science and engineering.

[Outline] Students learn techniques in bioscience and bioengineering under the guidance of supervisors in man-to-man or a small-group environment.

[Course Objective(s)]

A student is supposed to acquire practical research methods, techniques, equipment-handling, data analysis and problem-solving, which are necessary in master course research in science and engineering.

[Format] Practical research training in laboratories under the guidance of supervisors or other staff in the department in man-to-man or a small-group environment.

[Course Description and Timetable]

To be specified by the supervisor(s)

[Grading System] To be specified by the supervisor(s)

[Prerequisite Reading] To be specified by the supervisor(s)

[Reference Materials] To be specified by the supervisor(s)

[Important Course Requirements] To be specified by the supervisor(s)

[Office hours] To be specified by the supervisor(s)

[Note(s) to students] (None)

Developmental and Regenerative Bioscience

(Code: 3023 1st year 2 units)

1. Instructor (s)

Professor Hiroshi Nishina E-mail nishina.dbio@mri.tmd.ac.jp
Professor Toshiaki Ohteki E-mail ohteki.bre@mri.tmd.ac.jp
Professor Hiroshi Asahara E-mail asahara.syst@tmd.ac.jp
Professor Fumitoshi Ishino E-mail fishino.epgn@mri.tmd.ac.jp
Professor Hiroshi Shibuya E-mail shibuya.mcb@mri.tmd.ac.jp
Associate Professor Hidehito Kuroyanagi E-mail kuroyana.end@tmd.ac.jp
Assistant Professor Hinako.M. Takase E-mail htakase.arc@cmn.tmd.ac.jp
Associate Professor Koh Nakayama E-mail nakayama.mtt@mri.tmd.ac.jp
Professor Sachiko Iseki E-mail s.iseki.emb@tmd.ac.jp

2. Classroom/Lab

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3. Course Purpose and Outline

Course Purpose

It is the mission of these lectures to provide a wide spectrum of knowledge covering recent advances in cellular biology and developmental and regenerative biology that can be used by students to conduct their own research projects.

Outline

This course covers cellular biology and developmental biology with an emphasis on signal transduction. We will discuss how modern cellular, molecular and genetic approaches are advancing the fundamentals of biology and medicine. An additional objective of the course is to learn about research techniques and their application to currently unresolved issues in biology.

4. Course Objective(s)

To acquire a wide spectrum of knowledge covering recent advances in cellular biology and developmental and regenerative biology.

5. Format

Lecture

6. Course Description and Timetable

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7. Grading System

Examination on December 6, 2017 (50%) and Attendance (50%)

8. Prerequisite Reading

Basic knowledge on molecular biology

9. Reference Materials

Scott F. Gilbert Developmental Biology

10. Important Course Requirements

None

1 1. Office hours

Contact person: Professor Hiroshi Nishina, E-mail: nishina.dbio@mri.tmd.ac.jp

1 2. Note(s) to students

None

Schedule

No	Day Time	Topics Venue	Instructor
1	November 27, 2017 8:50-10:20	Musculoskeletal development and regeneration (Lecture Room, 6F, Building 3)	Dr. H. Asahara
2	November 27, 2017 10:30-12:00	Musculoskeletal development and regeneration (Lecture Room, 6F, Building 3)	Dr. H. Asahara
3	November 28, 2017 8:50-10:20	Molecular biology of liver development (Lecture Room, 6F, Building 3)	Dr. H. Nishina
4	November 28, 2017 10:30-12:00	Molecular biology of liver development (Lecture Room, 6F, Building 3)	Dr. H. Nishina
5	November 29, 2017 8:50-10:20	Biology of dendritic cells (Lecture Room, 6F, Building 3)	Dr. T. Ohteki
6	November 29, 2017 10:30-12:00	Biology of dendritic cells (Lecture Room, 6F, Building 3)	Dr. T. Ohteki
7	November 30, 2017 8:50-10:20	Mammalian development and epigenetics (Lecture Room, 6F, Building 3)	Dr. F. Ishino
8	November 30, 2017 10:30-12:00	Development and regeneration of craniofacial tissue (Lecture Room, 6F, Building 3)	Dr. S. Iseki
9	December 1, 2017 8:50-10:20	Molecular mechanism of development (Lecture Room, 6F, Building 3)	Dr. H. Shibuya
10	December 1, 2017 10:30-12:00	Molecular mechanism of development (Lecture Room, 6F, Building 3)	Dr. H. Shibuya
11	December 4, 2017 8:50-10:20	Post-transcriptional regulation of gene expression in development. (Lecture Room, 6F, Building 3)	Dr. H. Kuroyanagi
12	December 4, 2017 10:30-12:00	Developmental Biology of Reproductive System (Lecture Room, 6F, Building 3)	Dr. H.M. Takase
13	December 5, 2017 8:50-10:20	Cellular Oxygen Response: basics and pathophysiology (Lecture Room, 6F, Building 3)	Dr. K Nakayama
14	December 5, 2017 10:30-12:00	Cellular Oxygen Response: basics and pathophysiology (Lecture Room, 6F, Building 3)	Dr. K Nakayama
15	December 6, 2017 8:50-10:20	Summary of Developmental and Regenerative Bioscience (Examination) (Lecture Room, 6F, Building 3)	Dr. T.Ohteki

Disease OMICS Informatics

(Code: 3029 1st year 2 units)

1. Instructor (s)

Tatsuhiko Tsunoda (Professor, Department of Medical Science Mathematics; tsunoda.mesm@mri.tmd.ac.jp)

Daichi Shigemizu (Junior Associate Professor, Department of Medical Science Mathematics; d.shigemizu.mesm@mri.tmd.ac.jp)

Fuyuki Miya (Assistant Professor, Department of Medical Science Mathematics; miya.mesm@mri.tmd.ac.jp)

Takashi Kohda (Associate Professor, Department of Epigenetics; tkohda.epgn@mri.tmd.ac.jp)

Alokanand Sharma (Research Scientist, RIKEN Integrative Medical Sciences; alokanand.sharma@riken.jp)

Artem Lysenko (Postdoctoral Researcher, RIKEN Integrative Medical Sciences; artem.lysenko@riken.jp)

Jun Hosoe (Researcher, The University of Tokyo Hospital; jhosoe-tky@umin.ac.jp)

2. Classroom/Lab

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3. Course Purpose and Outline

Course Purpose

To understand disease omics and methodologies for analyzing them

Outline

In this lecture, we discuss how to apply bioinformatics techniques to medicine and medical science. Nowadays, it has been keenly desired to establish personalized/precision medicine on the basis of applying optimum therapy for each patient, and also to predict individuals' disease risk for preventing disease. For these, integrative analyses of omics-data, as well as mathematical modeling approaches to disease, are necessary. We look at how modern research on omics and systems analyses, including metagenomic and trans-omic analyses, have been/will be applied with intractable diseases, cancer, and common diseases. We also discuss future perspectives on medical systems for establishing personalized/precision/preventive medicine. No prior knowledge in bioinformatics is required.

4. Course Objectives

To achieve the level that you can explain:

- Why mathematics, e.g. statistical genetics, and informatics are necessary for modern medical science.
- Typical methodologies of getting omic data from disease patients.
- Methodologies of analyzing disease omic data, and how to discover genes causal of/related to disease.
- Concrete examples to understand disease with systems approach.
- How to apply the optimum therapy for each patient and/or how to prevent disease from individuals.

5. Format

Lectures, practices with computers, presentations by the students, and discussion.

6. Course Description and Timetable

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7. Grading System

Presentation in the class (40%) and Attendance (60%)

8. Prerequisite Reading

Bioinformatics for Omics Data ISBN 978-1617790263 will be used for presentations by the students.

Also, it is desired to learn beforehand with web search about the human genome project, gene polymorphism, genome-wide association study (GWAS), linkage disequilibrium, next-generation sequencers.

9. Reference Materials

Hand-outs will be provided.

1 0. Important Course Requirements

Four classes are for presentations by the students and discussion. Each student must read chapter(s) of 'Bioinformatics for Omics Data', summarize the chapter to make presentation in the class for discussion. When you can not attend the lecture(s), make copies of hand-outs asking other students for it. Do not eat/drink during the course. Power-off your mobile/smart-phone and do not put it on your desk. In it is necessary for accessibilities, declare it beforehand. Do not talk for

1 1. Availability in English

All lectures or partial lectures are taught in English.

1 2. Office hours

16:30-18:00 on Tuesday, Professor's office (Tatsuhiko Tsunoda; 25th floor of M&D tower)

1 3. Note(s) to students

Nothing

Schedule

No	Day Time	Topics Venue	Instructor
1	October 17, 2017 13:00-14:30	Introductory to disease omics informatics (Lecture Room, 6F, Building 3)	Tatsuhiko Tsunoda
2	October 17, 2017 14:40-16:10	Genome-wide association study (Lecture Room, 6F, Building 3)	Tatsuhiko Tsunoda
3	October 24, 2017 13:00-14:30	Presentation by the students and discussion (Lecture Room, 6F, Building 3)	Daichi Shigemizu, Tatsuhiko Tsunoda, Fuyuki Miya
4	October 24, 2017 14:40-16:10	UNIX practice (Information Retrieval Room, Library, 4F, M&D tower)	Tatsuhiko Tsunoda, Daichi Shigemizu, Fuyuki Miya
5	October 26, 2017 13:00-14:30	GWAS practice (Information Retrieval Room, Library, 4F, M&D tower)	Tatsuhiko Tsunoda, Daichi Shigemizu, Fuyuki Miya
6	October 26, 2017 14:40-16:10	Next-generation sequencer (NGS) data analysis (Lecture Room, 6F, Building 3)	Tatsuhiko Tsunoda, Fuyuki Miya
7	October 27, 2017 13:00-14:30	Presentation by the students and discussion (Lecture room 1, 21F, M&D tower)	Tatsuhiko Tsunoda, Daichi Shigemizu, Fuyuki Miya
8	October 27, 2017 14:40-16:10	NGS data analysis practice (Information Retrieval Room, Library, 4F, M&D tower)	Tatsuhiko Tsunoda, Daichi Shigemizu, Fuyuki Miya
9	October 30, 2017 13:00-14:30	Gene expression analysis (Lecture Room, 6F, Building 3)	Fuyuki Miya, Jun Hosoe
10	October 30, 2017 14:40-16:10	Epigenome analysis (Lecture Room, 6F, Building 3)	Takashi Kohda
11	October 31, 2017 14:40-16:10	Cancer genome/omics analysis (Lecture room 1, 21F, M&D tower)	Tatsuhiko Tsunoda
12	October 31, 2017 16:20-17:50	Network analysis (Lecture room 1, 21F, M&D tower)	Artem Lysenko
13	November 1, 2017 13:00-14:30	Prediction methods (Lecture room 1, 21F, M&D tower)	Piotr J. Kamola
14	November 1, 2017 14:40-16:10	Presentation by the students and discussion (Lecture room 1, 21F, M&D tower)	Tatsuhiko Tsunoda, Daichi Shigemizu, Fuyuki Miya
15	November 1, 2017 16:20-17:50	Presentation by the students and discussion (Lecture room 1, 21F, M&D tower)	Tatsuhiko Tsunoda, Daichi Shigemizu, Fuyuki Miya

Chemical Biology

(Code: 3031 1st year 2 units)

1. Instructor(s)

Name	Department, Title	E-mail
Hiroyuki Kagechika	Organic and Medicinal Chemistry, Professor	kage.chem@tmd.ac.jp
Hirokazu Tamamura	Medicinal Chemistry, Professor	tamamura.mr@tmd.ac.jp
Takamitsu Hosoya	Chemical Bioscience, Professor	thosoya.cb@tmd.ac.jp
Soichi Kojima	RIKEN Molecular and Chemical Somatology, Visiting Professor	skojima@postman.riken.go.jp
Tomoya Hirano	Organic and Medicinal Chemistry, Associate Professor	hira.chem@tmd.ac.jp
Wataru Nomura	Medicinal Chemistry, Associate Professor	nomura.mr@tmd.ac.jp
Shuichi Mori	Organic and Medicinal Chemistry, Associate Professor	s-mori.chem@tmd.ac.jp
Hiroki Shirai	Astellas Pharm Inc, Executive Fellow	

2. Classroom/Lab

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3. Course Purpose and Outline

Course Purpose

The purpose of this course is to understand the basic and application about chemical biology field. Chemical biology is a new and significant field of bioscience. This field includes the research to solve the biological problems at the molecular level or to regulate the biological systems by using the techniques, knowledge and ideas of chemistry.

Outline

This course deals with the overview of the chemical biology field including some topics of recent research, including organic chemistry, medicinal chemistry, genomic drug discovery, and bioinformatics.

4. Course Objective(s)

This course objective is to comprehend the methodology and technology of chemical biology, including molecular design, organic synthesis, biological functional analysis, and drug discovery.

5. Format

Lecture

6. Course Description and Timetable

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7. Grading System

Final examination (60%) and Attendance/Discussion (40%)

8. Prerequisite Reading

review on the fundamental organic chemistry

9. Reference Materials

- L. Schreiber, T. Kapoor, G. Wess (eds.) Chemical Biology, WILEY-VCH
- H. Osada (ed.) Bioprobes, Springer
- Kamerling, J. P. (ed) Comprehensive Glycoscience From Chemistry to System Biology, Elsevier
- Annes, J. P.; Munger, J. S.; Rifkin, D. B. J Cell Sci 116:217-224, 2003.
- Liby, K. T.; Yore, M. M.; Sporn, M. B. Nature Reviews Cancer 7:357-369, 2007.
- Ferrara, N.; Kerbel, R. S. Nature 438:967-974, 2005.

10. Important Course Requirements

none

11. Availability in English

All lectures or partial lectures are taught in English.

12. Office hours

April 12 – June 22, 15:00–17:00
Hiroyuki Kagechika, kage.chem@tmd.ac.jp
Rm 609A, Floor 6, Bldg 21

13. Note(s) to students

none

Schedule

No	Day Time	Topics Venue	Instructor
1	November 7, 2017 13 : 00–14 : 30	Overview of Chemical Biology (Building 22, 1 F, seminar room 2)	Hiroyuki Kagechika
2	November 8, 2017 13 : 00–14 : 30	Organic Chemistry for Chemical Biology (Building 22, 1 F, seminar room 2)	Takamitsu Hosoya
3	November 8, 2017 14 : 40–16 : 10	Organic Chemistry for Chemical Biology (Building 22, 1 F, seminar room 2)	
4	November 9, 2017 13 : 00–14 : 30	Analytical Method for Chemical Biology (Building 22, 1 F, seminar room 2)	Tomoya Hirano
5	November 9, 2017 14 : 40–16 : 10	Analytical Method for Chemical Biology (Building 22, 1 F, seminar room 2)	
6	November 10, 2017 13 : 00–14 : 30	Peptide–Lead Mid–Size Drugs (Building 22, 1 F, seminar room 2)	Hirokazu Tamamura
7	November 10, 2017 14 : 40–16 : 10	Peptide–Lead Mid–Size Drugs (Building 22, 1 F, seminar room 2)	
8	November 14, 2017 14 : 40–16 : 10	Clarification of Drug Action Mechanism by Chemical Biology Techniques (Building 22, 1 F, seminar room 2)	Soichi Kojima
9	November 14, 2017 16 : 20–17 : 50	Clarification of Drug Action Mechanism by Chemical Biology Techniques (Building 22, 1 F, seminar room 2)	
10	November 15, 2017 14 : 40–16 : 10	Chemical Biology of the Genome (Building 22, 1 F, seminar room 2)	Wataru Nomura
11	November 15, 2017 16 : 20–17 : 50	Chemical Biology of the Genome (Building 22, 1 F, seminar room 2)	
12	November 16, 2017 13 : 00–14 : 30	Chemical Biology and Protein Engineering (Building 22, 1 F, seminar room 2)	Shuichi Mori
13	November 16, 2017 14 : 40–16 : 10	Chemical Biology and Protein Engineering (Building 22, 1 F, seminar room 2)	
14	November 20, 2017 14 : 40–16 : 10	Informatics for Drug Discovery (Building 22, 1 F, seminar room 2)	Hiroki Shirai
15	November 20, 2017 16 : 20–17 : 50	Informatics for Drug Discovery (Building 22, 1 F, seminar room 2)	

Special Lectures on Molecular Structures

(Code: 3033 1st year 2 units)

1. Instructor (s)

Nobutoshi Ito (Dept of Structural Biology, Professor)
Teikichi Ikura (Dept of Structural Biology, Associate Professor)
Nobutaka Numoto (Dept of Structural Biology, Assistant Professor)
Masayuki Nara (Dept of Chemistry, Professor)
Hidekazu Hiroaki (Nagoya University, Professor)
Kengo Kinoshita (Tohoku University, Professor)
Masataka Kuroda (Mitsubishi Tanabe Pharma, Chief Scientist)

2. Classroom/Lab

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3. Course Purpose and Outline

Course Purpose

Recent advances in structural biology resulted in not only in understanding molecular basis of biology and medicine but also accumulation of a large amount of structural information. The purpose of the course is that those students who are not specialized in the field understand the basics of the method and are able to make use of such information.

Outline

This course deals with three-dimensional structure of biological macromolecules such as proteins and nucleic acids. The basic ideas about structural biology are shown first and their implications to the biological activity and industrial importance will then be discussed. The practical methods to determine such structures, mainly X-ray crystallography and nuclear magnetic resonance (NMR) spectroscopy are also explained.

4. Course Objective(s)

To understand the structural information of biological macromolecules and make its use in one's own field.

5. Format

Lecture/Lab

6. Course Description and Timetable

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7. Grading System

Final examination (70 %) Contribution to the lectures (30 %)

8. Prerequisite Reading

None

9. Reference Materials

Branden & Tooze, "Introduction to Protein Structure" (Garland Publishing)

10. Important Course Requirements

None

1 1. Availability in English

All lectures or partial lectures are taught in English.

1 2. Office hours

On request (by prior appointment with Prof Ito)

1 3. Note(s) to students

None

Schedule

No	Day Time	Topics Venue	Instructor
1	November 27, 2017 13:00-14:30	Introduction to Protein Structures I (Lecture Room, 6F, Building 3)	N. Ito
2	November 27, 2017 14:40-16:10	Introduction to Protein Structures II (Lecture Room, 6F, Building 3)	
3	November 28, 2017 13:00-14:30	Structure and function & molecular recognition I (Lecture Room, 6F, Building 3)	
4	November 28, 2017 14:40-16:10	Structure and function & molecular recognition II (Lecture Room, 6F, Building 3)	
5	November 29, 2017 13:00-14:30	Methods to determine the structure of biological macromolecules I (Lecture Room, 6F, Building 3)	
6	November 29, 2017 14:40-16:10	Methods to determine the structure of biological macromolecules II (Lecture Room, 6F, Building 3)	
7	November 30, 2017 13:00-14:30	Protein folding & stability I (Lecture Room, 6F, Building 3)	T. Ikura
8	November 30, 2017 14:40-16:10	Protein folding & stability II (Lecture Room, 6F, Building 3)	
9	December 1, 2017 13:00-14:30	NMR analysis of proteins I (Lecture Room, 6F, Building 3)	H. Hiroaki
10	December 1, 2017 14:40-16:10	NMR analysis of proteins II (Lecture Room, 6F, Building 3)	
11	December 4, 2017 13:00-14:30	Protein structure & drug development (Lecture Room, 6F, Building 3)	M. Kuroda
12	December 4, 2017 14:40-16:10	Computational analysis (Lecture Room, 6F, Building 3)	K. Kinoshita
13	December 5, 2017 13:00-14:30	Crystallization & data analysis of proteins (Lecture Room, 6F, Building 3)	N. Ito, T. Ikura & N. Numoto
14	December 5, 2017 14:40-16:10	Crystallization & data analysis of proteins (Lecture Room, 6F, Building 3)	
15	December 6, 2017 10:30-12:00	Structure analysis of biomolecules by infrared and Raman spectroscopies (Lecture Room, 6F, Building 3)	M. Nara

Advanced Biomaterials Science

(Code: 3034 1st year 2 units)

1. Instructor(s)

Nobuhiko Yui, Prof. of Organic Biomaterials yui.org@tmd.ac.jp
Takao Hanawa, Prof. of Metallic Biomaterials hanawa.met@tmd.ac.jp
Kimihiro Yamashita, Prof. of Inorganic Biomaterials yama-k.bcr@tmd.ac.jp
Yusuke Tsutsumi, Assoc. Prof. of Metallic Biomaterials tsutsumi.met@tmd.ac.jp
Miho Nakamura, Assoc. Prof. of Inorganic Biomaterials miho.bcr@tmd.ac.jp
Atsushi Tamura, Assist. Prof. of Organic Biomaterials tamura.org@tmd.ac.jp
Yoshinori Arisaka, Assist. Prof. of Organic Biomaterials arisaka.org@tmd.ac.jp
Naohiro Horiuchi, Assist. Prof. of Inorganic Biomaterials nhori.bcr@tmd.ac.jp

2. Classroom/Lab

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3. Course Purpose and Outline

Course Purpose

To understand the basis of biomaterials used for a variety of applications in contact with living body. The properties of biomaterials are requested to vary as to adopt their applications in hard and soft tissues. The final goal of this course is to master basic knowledge on biomaterials including metals, ceramics, and polymeric materials covering a wide range of medical applications.

Outline

This course deals with bio-inspired systems using metals, ceramics, and organic materials from basic material science to biotechnological and biomedical applications. Recent topics about drug delivery system and tissue engineering will be also lectured.

4. Course Objective(s)

This course provides basic information on biomaterials including metals, ceramics and polymeric materials. It is important to understand how these biomaterials have been applied for a wide range of clinical issues as to recover and/or regenerate the lost properties of original body functions.

5. Format

Lecture

6. Course Description and Timetable

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7. Grading System

Final examination (50%), Attendance (50%)

8. Prerequisite Reading

None

9. Reference Materials

Any references will be suggested during the lectures.

10. Important Course Requirements

Each instructor will advice in advance as to promote a better understanding of students.

11. Office hours

Any questions on each lecture are always welcome.

1 2. Note(s) to students

This lecture is a basic course of "Applied Biomaterials (3036)". For deeper understanding, it is advised to take "Applied Biomaterials(3036)" simultaneously.

Schedule

No	Day Time	Topics Venue	Instructor
1	October 25, 2017 13:00~14:30	Introduction (classification & historical background) (Meeting Room 2, Floor 1, Building 22)	N. Yui
2	October 25, 2017 14:40~16:10	Structure of metals (Meeting Room 2, Floor 1, Building 22)	Y. Tsutsumi
3	October 26, 2017 8:50~10:20	Deformation and fracture of metals (Meeting Room 2, Floor 1, Building 22)	Y. Tsutsumi
4	October 26, 2017 10:30~12:00	Polymer properties (Meeting Room 2, Floor 1, Building 22)	N. Yui
5	October 27, 2017 16:20~17:50	Polymer structure (Meeting Room 2, Floor 1, Building 22)	N. Yui
6	November 2, 2017 14:40~16:10	Polymer synthesis (Meeting Room 2, Floor 1, Building 22)	A. Tamura
7	November 2, 2017 16:20~17:50	Polymer processing (Meeting Room 2, Floor 1, Building 22)	Y. Arisaka
8	November 7, 2017 16:20~17:50	Introduction to bioceramics (Meeting Room 2, Floor 1, Building 22)	K. Yamashita
9	November 8, 2017 16:20~17:50	Bioceramics of calcium phosphate (Meeting Room 2, Floor 1, Building 22)	
10	November 9, 2017 8:50~10:20	Overview of materials 1: (Meeting Room 2, Floor 1, Building 22)	T. Hanawa
11	November 9, 2017 10:30~12:00	Overview of materials 2: (Meeting Room 2, Floor 1, Building 22)	
12	November 10, 2017 16:20~17:50	Surface property of metals (Meeting Room 2, Floor 1, Building 22)	Y. Tsutsumi
13	November 16, 2017 8:50~10:20	Medical application of metals (Meeting Room 2, Floor 1, Building 22)	T. Hanawa
14	November 16, 2017 10:30~12:00	Bioceramic processing and properties (Meeting Room 2, Floor 1, Building 22)	N. Horiuchi
15	November 17, 2017 16:20~17:50	Bioceramic processing and properties (Meeting Room 2, Floor 1, Building 22)	M. Nakamura

Applied Biomaterials

(Code: 3036 1st year 2 units)

1. Instructor (s)

Akiko Nagai, Assoc. Prof. of Material Biofunctions nag-bcr@tmd.ac.jp
Takao Hanawa, Prof. of Metallic Biomaterials hanawa.met@tmd.ac.jp
Nobuhiko Yui, Prof. of Organic Biomaterials yui.org@tmd.ac.jp
Akio Kishida, Prof. of Material-based Medical Engineering kishida.mbme@tmd.ac.jp
Tsuyoshi Kimura, Assoc. Prof. Material-based Medical Engineering kimurat.mbme@tmd.ac.jp
Atsushi Tamura, Assist. Prof. of Organic Biomaterials tamura.org@tmd.ac.jp
Kosuke Nozaki, Assist. Prof. of Material Biofunctions k.nozaki.fpro@tmd.ac.jp
Yoshihide Hashimoto,, Assist. Prof. of Material-based Medical Engineering
hashimoto.atrm@tmd.ac.jp

2. Classroom/Lab

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3. Course Purpose and Outline

Course Purpose

To understand pathological phenomena associated with biomaterials and pathophysiological responses of the body to the devices. The final goal of this course is to find future challenges of the biomaterials for clinical application.

Outline

This course deals with the reaction of living body to biomaterials, physiology, biochemistry, cell biology, immunology in order to understand biomaterials in details. Future direction and the problems to be solved of the biomaterials research will be discussed.

4. Course Objective(s)

This course provides information on principle interactions between the body and the biomaterials.

It is important to build new strategies for clinical application from the existing information.

5. Format

Lecture

6. Course Description and Timetable

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7. Grading System

Final examination 50%, Attendance 50%
12 attendances out of 15 are needed to take the exam.

8. Prerequisite Reading

To be announced by each lecturers.

9. Reference Materials

To be announced by each lecturers.

10. Important Course Requirements

To have motivation to contribute the advancement of medical science.

11. Office hours

As needed

1 2. Note(s) to students

This lecture is an advanced course of "Advanced Biomaterials Science (3034)". For deeper understanding, it is advised to take "Advanced Biomaterials Science (3034)" simultaneously.

Schedule

No	Day Time	Topics Venue	Instructor
1	November 24, 2017 13:00~14:30	Basic Pathology (Meeting Room 2, Floor 1, Building 22)	A. Nagai
2	November 24, 2017 14:40~16:10	Disease and Biomaterials (Meeting Room 2, Floor 1, Building 22)	A. Kishida
3	November 27, 2017 16:20~17:50	Biological response 1: toxicity & acute inflammation (Meeting Room 2, Floor 1, Building 22)	N. Yui
4	November 28, 2017 16:20~17:50	Biological response 2: chronic inflammation (Meeting Room 2, Floor 1, Building 22)	A. Kishida
5	November 29, 2017 16:20~17:50	Biological response 3: drug metabolism (Meeting Room 2, Floor 1, Building 22)	A. Tamura
6	November 30, 2017 16:20~17:50	Biological response 4: biomaterials & infections (Meeting Room 2, Floor 1, Building 22)	K. Nozaki
7	December 1, 2017 16:20~17:50	Biological response 5: cells & biomaterials (Meeting Room 2, Floor 1, Building 22)	N. Yui
8	December 4, 2017 16:20~17:50	Clinical application and challenge 1: polymeric biomaterials (Meeting Room 2, Floor 1, Building 22)	Y. Hashimoto
9	December 5, 2017 16:20~17:50	Clinical application and challenge 2: Bioceramics (Meeting Room 2, Floor 1, Building 22)	K. Nozaki
10	December 6, 2017 14:40~16:10	Clinical application and challenge 3: Metals (Meeting Room 2, Floor 1, Building 22)	T. Hanawa
11	December 6, 2017 16:20~17:50	Clinical application and challenge 4: regenerative medicine (Meeting Room 2, Floor 1, Building 22)	T. Kimura
12	December 7, 2017 8:50~10:20	Clinical application and challenge 5: pharmacology (Meeting Room 2, Floor 1, Building 22)	A. Tamura
13	December 7, 2017 10:30~12:00	Future development 1: Bioceramics (Meeting Room 2, Floor 1, Building 22)	A. Nagai
14	December 8, 2017 8:50~10:20	Future development 2: polymeric biomaterials (Meeting Room 2, Floor 1, Building 22)	N. Yui
15	December 8, 2017 10:30~12:00	Future development 3: Metals (Meeting Room 2, Floor 1, Building 22)	T. Hanawa

Translational Research

(Code: 3040 1st year 2 units)

1. Instructor (s)

Yoshihiro Takemoto, Professor, Life Science and Technology Track
Disease Prevention Science Course Program
Hiroyuki Kagechika, Professor, Department of Organic and Medicinal Chemistry

2. Classroom/Lab

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3. Course Purpose and Outline

Course Purpose

This course will follow a learning course covering basic research to clinical research and the marketplace (i.e. application and contribution to society), offering a comprehensive review of such topics as the issues in basic research, intermediary research (start-ups), and international clinical research, the marketplace perspective, how to think about intellectual property and regulations (regulatory science), methods for project management when running research development projects, etc., with the objective of obtaining an overall view of life science in its practical application.

Overview

In this course, first you will learn about the overall world trend in the pharmaceutical industry in terms of drug creation and development. After this, you will learn about the methods behind start ups and the entrepreneurs behind them, which play an important intermediary role between basic and applied research (in this case, clinical research). There will also be practice-based lectures on case studies where findings from university-based basic research were taken up in clinical research via start up companies. As background knowledge, you will learn about intellectual property and regulations. You will also study, through practice, about the management skills needed for running the different types of projects. Through this series of lectures, you will obtain an overall understanding of the issues and current status of translational research, which links research and society.

4. Course Objective(s)

Life science, which takes people as its subject, can be divided into three stages: basic research, clinical research, and intermediary research which connects the two. The objective of this course is the acquisition of an understanding and bird's-eye perspective of the issues at each stage.

5. Format

At the beginning of each lecture, we will discuss a current topic in bio-science. After the lecture portion, there will be time allotted for discussion among students and question and answer time with the lecturer, allowing for an interactive lecture course.

6. Course Description and Timetable

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7. Grading System

Grades shall be based on, participation during the lecture (40%), questions during the lecture (30%), and reports (30%).

8. Prerequisite Reading

none

9. Reference Materials

none

1 0. Important Course Requirements

This course is practice-based and each lecture is interrelated so attendance is essential.

1 1. Office hours

As needed, please make an appt. thru E-mail. Professor Yoshihiro Takemoto's,
takemoto.mech@tmd.ac.jp

1 2. Note(s) to students

none

Schedule

No	Day Time	Topics Venue	Instructor
1 2	October 30, 2017 16:20-19:30	Translational Research (1) (Meeting Room 2, Floor 1, Building 22)	Y. Takemoto
3 4	November 6, 2017 16:20-19:30	Translational Research (2) (Meeting Room 2, Floor 1, Building 22)	M.Muramatsu
5 6	November 13, 2017 16:20-19:30	Translational Research (3) (Meeting Room 2, Floor 1, Building 22)	Y. Takemoto
7 8	To be announced (~Jan, 2018)	Translational Research (4)	Y. Takemoto
9 10	To be announced (~Jan, 2018)	Translational Research (5)	Y. Takemoto
11 12	To be announced (~Jan, 2018)	Translational Research (6) (Off-campus learning)	Y. Takemoto
13 14 15	To be announced (~Jan, 2018)	Translational Research (7) (Off-campus learning)	Y. Takemoto

General Information for Students

1 Contact and Notices

All student announcements and notices (concerning scholarship matters, health examinations, tuition payments, etc.) will be posted or told by guidance counselor, and students should make sure they do not miss any new postings. (Notices are posted on the bulletin board in front of the nursery, on the first floor of Building 6).

Because this bulletin board is updated constantly, students should check the postings at least once a day to avoid missing important notices.

Announcements concerning the dates, times and locations of lectures are made by e-mail when necessary. Students must check their e-mail regularly to avoid missing this information as well.

2 Tuition Fee

Students should pay tuition fee by the end of October and April. Or students become a withdrawal in any reason.

3 Student Identification Cards

Students entering the university are issued student ID cards as a way to identify themselves as university students. These cards should be worn as nametags while on campus. Because these ID cards are designed to be used for the two-year master course, they should be treated with care so they are not damaged or lost.

Students need to carry these cards with them at all times to facilitate purchases of such items as student commuter passes and on other occasions.

(1) Reissue

Students should promptly notify Educational Planning Section if they have lost or damaged their ID card, and complete the procedures to have another card issued to them.

(2) Return the card

Students should promptly return their ID card to Educational Planning Section upon graduation, withdrawal or expulsion, or when the card expires.

4 Certificates and Other Documents

Numerous types of certificates and other official documents are issued by Educational Planning Section, while others may be obtained from automatic document issuing machines.

(1) Educational Planning Section (hours: 8:30 a.m. ~ 5:15 p.m.)

The following documents are issued by Educational Planning Section. Students will need to fill out the appropriate application forms to receive the needed items. (As a general rule, Japanese certificate takes several days to issue after application. English version requires about one week.

① Academic transcripts

- ② Prospective course completion certificates (for students enrolled in the second year program of the master course, and for students who applied for a degree thesis in the doctoral course)
- ③ English-language certificate of attendance (issue requires about one week)
- ④ Practical training commuter passes

Commuter passes for traveling to hospitals and other locations off campus for practical training and other purposes may be issued. Students needing such passes should apply for them at Educational Planning Section.

Please be aware that it takes about one month to obtain permission from the railway companies (for example, application procedures should be completed by the end of February to begin use from April).

Note: Students should consult with Educational Planning Section concerning certificates or other documents not listed above.

(2) Automatic document issuing machine (hours: 8:30 a.m. ~ 9:00 p.m.)

Certificates of registration and student discount certificates are available from the “automatic document issuing machine” in the Student Lounge (4F, Building 5). Inquiries: Student Support Section (ext.5077), Educational Planning Section (ext. 5074).

5 Student Passenger Discount Certificates (Student Discount Certificates)

(1) Students using Japan Railways (JR) for extracurricular activities — such as returning to their family homes or for other purposes — are eligible for discounts (20 percent) on passenger fares when the routes traveled exceed 100 kilometers one-way.

Because this system is meant to reduce the financial burden on students while attending school and thereby contribute to the advancement of their education, discounts should be used in a responsible and systematic fashion. (Up to 10 tickets per student within one year; valid for two months from date of issue.)

(2) Abuse or dishonest use of this privilege is strictly forbidden. Students engaging in the types of activities listed below will not only be penalized equivalent to double the cost of the normal fare, there is also the risk that student discounts will be suspended for all students attending the university.

- ① When a train ticket purchased with a student discount certificate is in another person’s name.
- ② When an individual other than the purchaser uses a discounted train ticket.
- ③ Using a discounted ticket after the deadline has expired.

(3) Student discount certificates are available at the “Automatic document issuing machine” in the Student Lounge (4F, Building 5; hours: 8:30 a.m. ~ 9:00 p.m.).

Inquiries: Student Support Section (ext.5077), Educational Planning Section (ext. 5074).

6 Changes in Address, Name, etc.

Notice of changes in the address, permanent domicile, name, etc. (including telephone numbers) of the student or the student’s guarantor should be promptly reported to Educational Planning Section and the proper procedures completed.

Neglecting to complete these procedures may make it impossible for the university to contact the student or the student’s guarantor in times of emergency or other cases.

7 Leave of Absence, Readmission, Withdrawal, Research Training Consignment, Study Abroad, Extending Attendance Period

All requests for a leave of absence, readmission, withdrawal, research training consignment and other status changes require approval from the university president, following referral from a faculty meeting of Graduate School of Medical and Dental Sciences. Due to the time required to process such requests, students should consult with Educational Planning Section in advance.

Furthermore, students wishing to obtain research training at another graduate school or other institution must obtain approval from a faculty meeting of Graduate School of Medical and Dental Sciences, and then secure agreement for the plan from the other graduate school, etc. Due to the time required to process such requests, students must submit the application materials to Educational Planning Section no later than two months prior to the date on which the desired consignment is scheduled to begin.

(1) **Absences** (submit no later than Two months prior to the desired date of absence)

Students requesting, for illness or other reasons, a leave from the university for a continuous period of three months or more, or subsequent extensions of such leave, must submit either a “Request for Leave” or a “Request for Extension of Leave” form to Educational Planning Section, and obtain proper permission from the president. (In cases of illness, a physician’s medical certificate must be attached to the request.)

Students considering taking a leave (or extending the period of leave) should consult closely with their academic advisor in advance.

The periods granted for leave cannot exceed a combined total of two years.

(2) **Readmission** (submit no later than Two months prior to the desired date of readmission)

Students on leave who wish to gain readmission to the university either during or at the completion of the period of the said leave must submit a “Request for Readmission” form (cosigned by their guarantor) to Educational Planning Section, and obtain proper permission from the president. (If the leave is due to illness, a physician’s medical certificate must be attached to the request).

(3) **Withdrawal** (submit no later than Two months prior to the desired date of withdrawal)

Students wishing to withdraw from the university due to illness or other circumstances that renders it difficult for them to continue their studies must submit a “Request for Withdrawal” form (cosigned by their guarantor) to Educational Planning Section, and obtain proper permission from the president.

Students considering such withdrawal should consult closely with their academic advisor in advance.

(4) **Research Training Consignment** (submit no later than two months prior to the desired date of research training consignment)

Students wishing to undergo research training at another graduate school, research institute or high-level hospital (hereafter referred to as “other institutions”) must submit

a “Request for Research Training Consignment” form after consulting with the other party in advance. If Graduate School of Medical and Dental Sciences determines that such training is beneficial from an educational perspective, it will be possible for students making such requests to undergo research training at the institution in question.

(5) **Study Abroad** (submit no later than two months prior to the desired date of study abroad)

Students wishing to study at an overseas graduate school or institution of higher education equivalent to such graduate schools must submit a “Request for Study Abroad” form after consulting with the other party in advance. If Graduate School of Medical and Dental Sciences determines that such study is beneficial from an educational perspective, it will be possible for students making such requests to study abroad.

(6) **Extending Attendance Period**

Students wishing to maintain attendance at the university beyond the standard number of years required to complete the course (excluding leaves) must submit a “Request for Attendance Period Extension” form by the stipulated date, and receive proper permission for the said extension.

The attendance period may be extended to a maximum of twice the standard number of years required to complete the course (excluding leaves).

8 Training and Research Requests

Students wishing to engage in training (practical training) or research (collection of data through surveys of patients or other means) at outside hospitals or institutions must submit a written request for the said training or research to Educational Planning Section.

9 Lost and Found

Notices of items lost and found on campus should be conducted at the following locations:

- (1) Lecture rooms: Educational Planning Section, Administrative Division, Institute of Education (1F, Building 1 West, ext. 4534)
- (2) Other than “(1)” above: Administrative divisions in charge of locations (buildings) where the specific items were lost or found.

10 Career Survey

Students completing the Graduate School course (including those projected to complete all course work) must fill out and submit career surveys to Student Support Section of Administration Division, Student Support and Health Administration Organization.

Inquiries: Student Support Section (ext. 5077).

11 Others

- (1) Mail addressed to specific individuals should also include the name of the affiliated research group.
- (2) Traffic regulations are in effect on campus, and students are not permitted to commute to the university by car. On-campus driving permits may be issued, however, for

students for whom commuting by train, bus or other means is difficult, with students in such situations encouraged to consult about applying for these permits.

(3) Administrative contacts

- ① Academic affairs: Educational Planning Section, Administrative Division, Institute of Education (1F, Building 1 West, ext. 4534)
- ② Tuition payments: Financial Planning Section, Financial and Facilities Division (3F, Building 1 West, ext. 5042)
- ③ Automatic document issuing machine for certificates, Scholarships, tuition waivers: Student Support Section (3F, Building 5, ext. 5077)
- ④ Automatic document issuing machine for certificates, other documents: Educational Planning Section (1F, Building 1 West, ext. 5074)

Procedures for Submitting Forms

Educational Planning Section (1F, Building 1 West)

Notification or Application Form	Summary	Submission Deadline
Request for Leave Request for Extension of Leave	For leave of 3 months or more *In case of illness, a physician's medical certificate must be attached	Submit no later than 2 months before desired date of leave
Request for Readmission		Submit no later than 2 months before desired date of readmission
Request for Withdrawal		Submit no later than 2 months before desired date of withdrawal
Request for Study Abroad	*To study at an overseas university or research institute, attach a request with a written explanation from an academic advisor and an acceptance letter from the overseas location	Submit no later than 2 months before desired date of study abroad
Request for Research Training Consignment	To receive research training from another graduate school or research institute	Submit no later than 2 months before desired date of training consignment
Request for Training or Research	To receive training or engage in research at another hospital, etc.	Submit no later than 2 weeks before desired date of training or research (2 months in advance for overseas study)
Request for Extending Attendance Period		Submit by late January
Notification of Name Change	*Attach documents attesting to change in family or given name	As required (submit promptly)
Notification of Change in Address		As required (submit promptly)
Notification of Change in Guarantor		As required (submit promptly)
Notification of Change in Address of Guarantor		As required (submit promptly)
Request for Reissue of Student ID	When student ID is lost or damaged	As required (submit promptly)

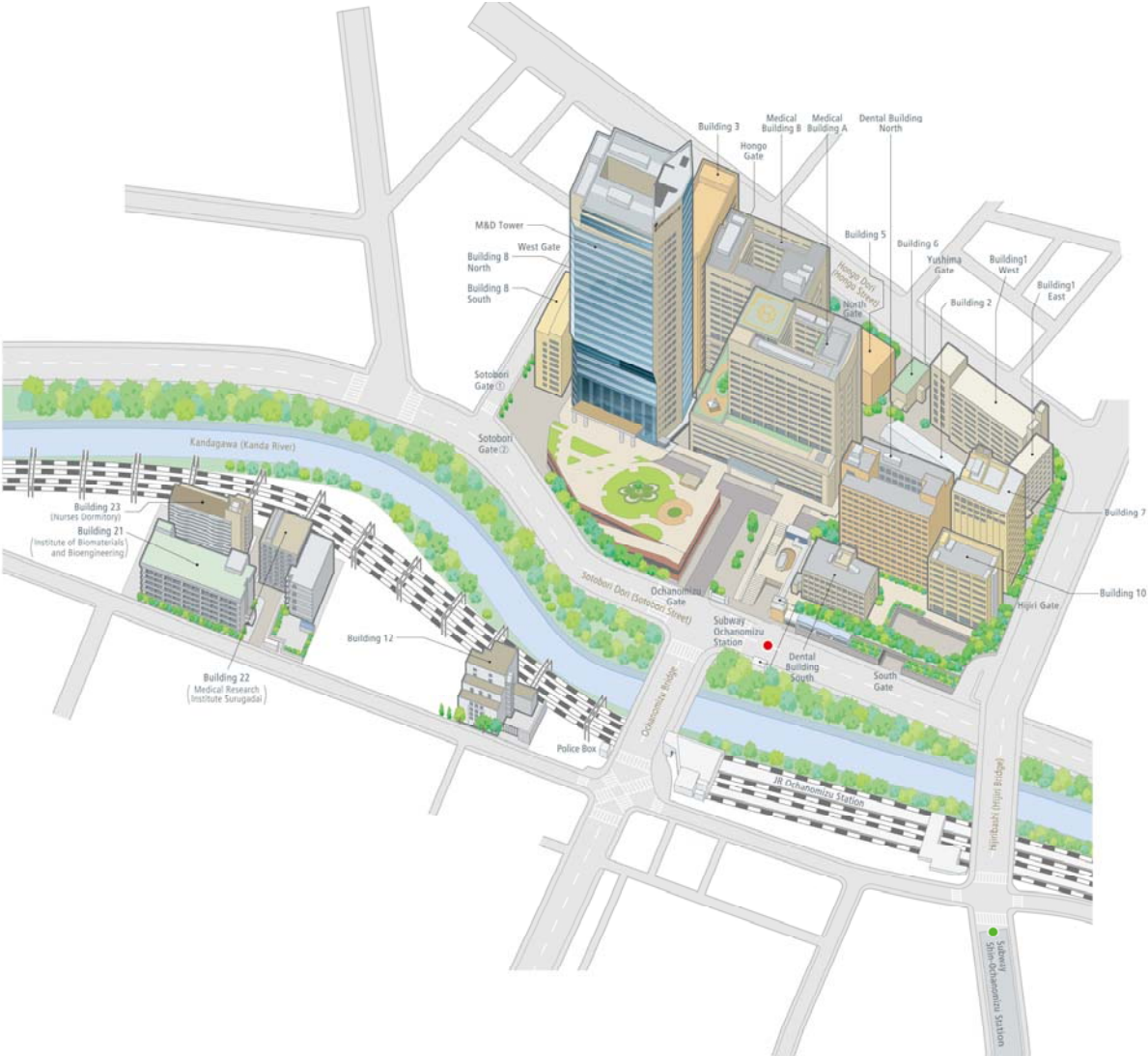
Issue of Certificates and Other Documents

Type	Application/Issue Location
Certificate of Attendance	Use the automatic document issuing machine (4F Student Lounge, Building 5) *Submit to Educational Planning Section if the document is in English.
Academic Transcript	Apply at the Educational Planning Section. Japanese certificate takes one week to issue after application. (English version requires about one week.)
Certificate of Credits Earned	
Certificate of Course Completion	
Certificate of Prospective Course Completion	
Certificate of Attendance Period	
Other Certificates	
Student Passenger Discount Certificate	Use the automatic issue machine (4F Student Lounge, Building 5)

Major On-Campus Facilities

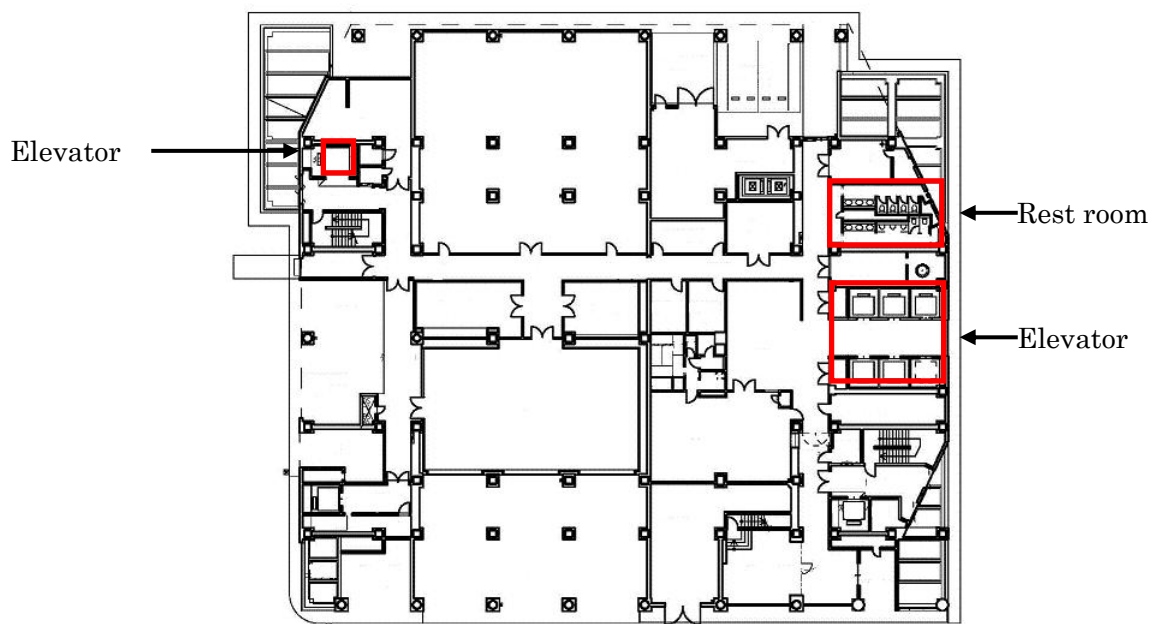
Lecture Room 3	11F, M&D Tower	
Seminar Room 3	23F, M&D Tower	
Training Room	19F, M&D Tower	
Conference Room 3	16F, M&D Tower	
Library	3/4F, M&D Tower	03-5803-5592
Health Service Center	2F, Building 5	
General Isotope Center	Building 8 North	03-5803-5788
Animal Research Center	7F, Building 7/B2F, Building 3/ B2F, M&D Tower	
Consumer's Cooperative, Cafeteria, Shop	1/B1F, Building 5	
Educational Planning Section	1F, Building 1 West	03-5803-4534
Student Support Section	3F, Building 5	03-5803-5077
Accounts Section, Finance Division	3F, Building 1 West	03-5803-5042

Campus Map

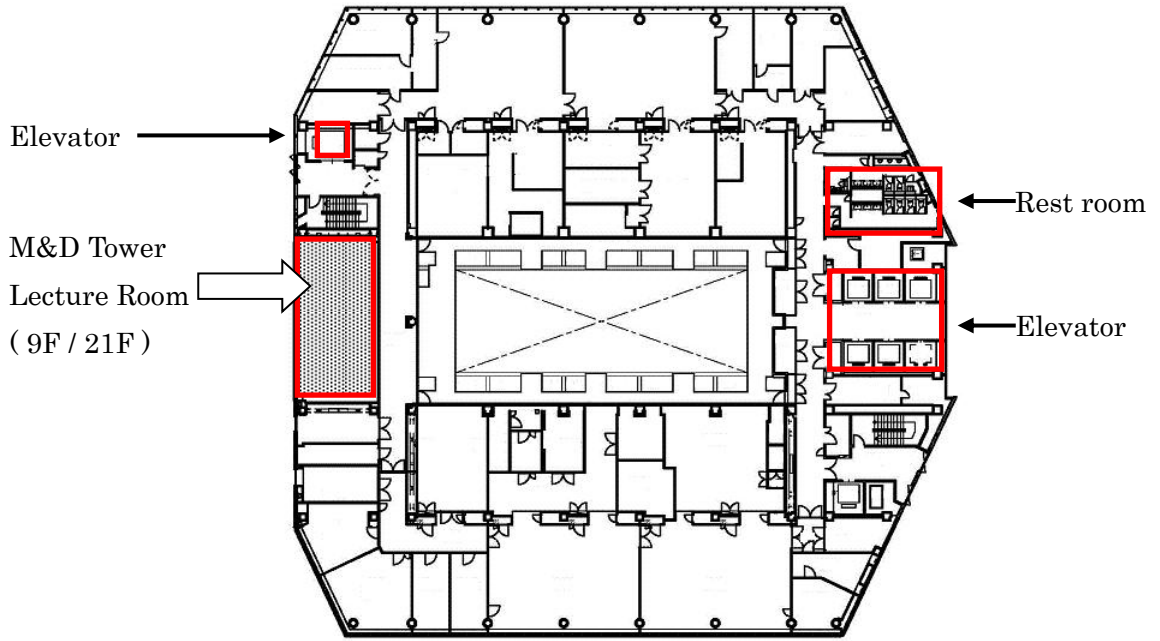


M&D Tower Floor Map

○The first floor plan



○The 9th / 21st floor plan



○The 23rd floor plan

