Doctoral Program in Medical Sciences

■ Doctor of Philosophy in Medical Sciences

Program Educational Objectives

Doctoral Program in Medical Sciences aims to understand the fundamental process of life phenomena, including fetal development, birth, growth, aging, senescence, and death, and find better ways to prevent, diagnose, and cure human diseases. The goal is to train researchers and practitioners who could make significant contributions to our society's health and welfare.

Graduate Profile	The scope of our medical science program includes biomedical, clinical, and public health sciences. Our graduates are expected to carry out original research utilizing cutting-edge techniques acquired from a wide range of medical and life technologies. High-quality research, combined with ethical knowledge and communicative skills, would advance the development of new diagnoses and treatments for diseases.

Diploma Policy

The degree of Doctor of Philosophy in Medical Sciences is commenced to those who have fulfilled the requirements for the completion of the Doctoral programs, as set out in the Graduate School Regulations of the University of Tsukuba and related university regulations, and who are deemed to have the following competences.

	Competences	Evaluation perspectives
Knowledge and Skills	1. Knowledge creation competence: Ability to create new knowledge that can contribute to future society	①Are there any research findings that can be considered new knowledge? ②Can we expect you to create knowledge that will contribute to future society?
	2. Management competence: Ability to plan and implement measures to identify and solve challenges from a higher perspective	①Can you make and implement long-term plans for critical challenges? ②Can you identify challenges, even in other areas of expertise, and solve them from a higher perspective?
	3. Communication competence: Ability to express the true nature of academic findings positively and clearly	①Can you explain the true nature of research content and specialized knowledge clearly and logically to researchers from different areas and to people other than researchers? ②Do you proactively share your findings with researchers and experts from your field of expertise and accurately answer questions?
	4. Leadership competence: Ability to have objectives get accomplished under your leadership	①Can you set attractive and compelling goals? ②Are you capable of building systems to realize goals and accomplish objectives as the leader?
	5. Internationality competence: Possession of a high level of awareness and motivation to be internationally active and contribute to international society	①Do you have strong awareness and motivation to contribute to international society and international activities? ②Have you obtained adequate linguistic skills for international information collection and action?
	6. Establish research agendas: Identify issues related to diseases and life phenomena and to formulate into an original research plan.	Be able to identify critical issues and develop an original research plan based on the latest findings in the field.

	Competences	Evaluation perspectives
Knowledge and Skills	7. Conduct advanced research: Ability to plan and execute cutting-edge research in life sciences.	①Be able to understand and apply the latest methods and procedures available from various fields of study to accomplish your research. ②Be able to have skills in collecting literature, developing a strategy, and consulting with others to achieve your research.
	8. Specialized knowledge: Understand and utilize advanced knowledge to overcome difficulties in elucidating diseases or life phenomena.	Acquire and apply basic, clinical, and social medicine knowledge to understand diseases and elucidate life phenomena.
	9. Ethics: High awareness and sense of ethics appropriate for researchers and professionals who overcome diseases and elucidate life phenomena.	①A high level of awareness and motivation to elucidate the diseases and life phenomena? ②Have an ethical view and moral principles suited for researchers and medical professionals.
	10. Ability to express informative content: Think logically and express oneself as a researcher and advanced medical professionals.	Be able to explain technical information logically and clearly in native and foreign languages.
Guidelines for Assessing Learning Outcomes	The Competence Self-Assessment Form is submitted at both the mid-term evaluation and the preliminary defense, and is verified by the supervisor and reviewers.	

Evaluation Criteria for Degree Theses/ Dissertations	Dissertation Requirements 1. Publish a research report that contributes to the development of medicine and in scientific journals. 2. The purpose, methods, results, and discussion of the research must be in a format appropriate for a dissertation. 3. The results obtained need to be verified for authenticity. 4. The research outcomes should be discussed appropriately. 5. The significance of the research should be addressed clearly, with an understanding of global research trends in related fields. Review board members – The dissertation review committee consists of one principal examiner and three secondary examiners. Candidates for the primary and secondary examiners are selected by a consensus of the medical degree program leader and the members of the Academic Affairs Committee. The establishment of the dissertation review committee is decided by the Steering Committee of the Graduate School of Comprehensive Human Sciences committee. – Candidates for principal examiners will be selected from the research advisors of the Graduate School of Comprehensive Human Sciences Research Group. – Candidates for secondary reviewers will be selected from among the research advisors or course instructors of the Graduate School of Comprehensive Human Sciences Research Group. In addition, faculty members of other graduate schools of the university, graduate schools of other universities, or those who are recognized by the Steering Committee of the Doctoral Program in Medical Sciences as having research achievements equivalent or superior to those of the graduate school may be added as candidates for secondary reviewers. – The dissertation review committee shall, in principle, select as candidates the same primary and secondary examiners as the preliminary dissertation review committee. Evaluation – In the second half of the fourth year, a preliminary dissertation review committee consisting of one primary examiner and three secondary examiners is formed. The committee will evaluate and provide guidance on dissertation preparation based on the content of the presentation and the planned dissertation. – The student meets the qualifications to submit a final dissertation if they pass the mid-term evaluation, publish at least one original research article as a first author in a peer-reviewed international journal (written in English), and obtain a passing grade by the preliminary dissertation review committee. – Upon submitting the dissertation, the dissertation review committee is established. The committee will review the dissertation and conduct a final examination.

Evaluation Criteria for Degree Theses/ Dissertations	Criteria for passing the final examination 1. Communication skills to merit the degree in Doctor of Medicine. 2. Understand the legal and ethical requirements in conducting medical research. 3. Be able to explain the objective, methods, and results of their research clearly and concisely. 4. Be able to explain, discuss and justify the results scientifically. 5. Explain the significance of the research in relation to global research trends in their field of study. 6. Be able to conduct independent research and publish the new research finding in academic journals in the future.

Curriculum Policy

While the remarkable progress in life and medical sciences has brought steady improvement in medicine, there is still a need for new treatment and prevention methods for most diseases. For this purpose, it is necessary to understand all phenomena of human life. The Biomedical Science division has promoted education and research to understand life phenomena and diseases mainly from life sciences and basic medicine prospective. The Clinical Medical Science division focuses on understanding life phenomena and diseases from clinical and social medicine perspectives.

The Doctoral Program in Medical Sciences merged the two divisions to provide education and research guidance beyond conventional training for doctoral students. The new program consists of core course subjects to prepare students to select their research topics. The students could formulate and implement the research plans, evaluate their results, and publish research findings in internationally recognized journals. The curriculum emphasizes research guidance involving multiple faculty members. It provides an environment where students can learn with international students and international researchers.

In addition to research activities, students will learn their capabilities and ethics in basic, clinical, and social medicine through various courses offered from both divisions. The education and research guidance in Comprehensive Human Science Research Group aims to understand the nature and science behind the “human beings”. Students will learn essential backgrounds and skills in medicine that apply to various fields of study.

Curriculum Design Framework	The General Education Courses provide ethical and legal knowledge to conduct biomedical research. The students will plan their research independently and learn advanced methodologies and research trends. The classes are taught in English with international students. In addition, maximizing the number of 50-course credits allows students to select courses relevant to their studies. Japanese will also be used for guidance and examination if student is more familiar or fluent in Japanese than English language.

Curriculum Design Framework	– "Introduction to Medical Research" course introduces bioethics, research ethics, information ethics, and legal knowledge about recombinant DNA and animal experiments. Students set their dissertation research agenda through discussions with their research advisors in the "Special Studies on Medical Sciences" and "Special Practice in Medical Sciences". The students will acquire the ability to plan and implement a research plan. – In the "Seminar in Medical Sciences", students will discuss various areas of medicine, refine their application skills, and acquire scientific writing skills. – "International Practical Medical Science" and "Medical and Scientific Communication" courses allow students to discuss their research with overseas researchers. They will also have an opportunity to present and listen to the research presentations from various topics. – In the "Lecture and Discussion" of the Major Subject group, students will learn to plan, conduct, and evaluate experimental approaches. In the "Seminar" , students learn from the abstracts of original research papers to understand the content research in their field of specialization and evaluate their research on global trends and standards. – It is recommended that students take two additional credits from Degree Programs' Common Courses, Inter-disciplinary Foundation Courses, and Graduate General Education Courses to acquire general and specific knowledge with broad perspectives.
Teaching and Learning Methods	The Program schedule is listed below. – By the end of the second year, students must earn 30 credits in required and elective courses. – In the first half of the third year, there will be a mid-term evaluation. Students will receive guidance on the preparation of their dissertations. – The student meets the qualifications to submit a final dissertation if they pass the mid-term evaluation, publish at least 1 original research article as a first author in a peer-reviewed international journal (written in English), and obtain a passing grade by the preliminary dissertation review committee during the second half of the fourth year. – Upon submitting the dissertation, the dissertation review committee is established. The committee will review the dissertation and conduct a final examination.

Admission Policy

Desired Student Profile	The objective of the program is to train individuals who can contribute to the understanding of life phenomena and diseases. We seek students who are motivated, ethically fit, and academically competent to the above objectives. We accept students from all over the globe in pursuing innovative research and have a strong will to contribute to the future of humanity.

Student Selection Process	– The candidates shall be selected by written and oral examinations. – The written examination will assess both English language skills and basic knowledge in life sciences and medicine. – The oral examination will be conducted in Japanese or English to evaluate the applicant's objectives, motivation, ethical quality, basic and specialized knowledge in the field of study, and communication skills

Learning Support Framework

Academic Support	The Program Office provides a range of academic support services, including assistance with mid-term and preliminary reviews, competence self-assessments, degree evaluations, and responding to student inquiries as needed. The program also supports students in preparing original research papers as first authors.
Opportunities for Peer Interaction	In the courses 'Lectures and Discussion' and 'Seminar', participation in lectures or seminars hosted by different laboratories is either recommended or required, offering opportunities for interaction with faculty and students across diverse fields.
Opportunities for Student–Faculty Interaction	In the mandatory course 'Lectures in Comprehensive Medical Sciences', students are encouraged to learn about the research conducted by faculty members in both basic science and clinical departments, and to acquire research techniques from experts in different fields that may be applicable to their own work.

Approaches to Assuring and Enhancing Educational Quality

The Educational Planning and Evaluation Committee carries out faculty development activities in collaboration with faculty organizations and academic programs.