

Five Divisions ,Graduate Institute of Medical Science

Division of Microbiology and Immunology

History and Overview

Division of Microbiology and Immunology was founded in 2007 and belongs to the Graduate Institute of Medical Sciences, College of Medicine. The Division recruits both master and doctoral students.

Goal of Education

The objective of our Division is to educate our graduate students to become a knowledgeable, well-skilled, and self-problem solving person. We hope our master graduate students provide our country new-blood and professional man power for biotechnology development. As for doctoral students, our educational goal is to cultivate self-learning and highly motivated independent researchers in the field of microbiology and immunology.

Distinctive Features of Education

Our Division offers advanced microbiology, advanced molecular immunology, applied microbiology, medical immunology, and seminar courses for graduate students. Required courses like cell biology and molecular biology are offered by the faculty members of the Graduate Institute of Medical Sciences to strengthen the basic knowledge of students. Besides classic lectures, paper discussion and seminar presentation are also emphasized during the study period.

Faculty

Presently, there are 2 professor, 4 associate professors, 3 assistant professors, totally 9 faculty members in the Division of Microbiology and Immunology. The specialties of our faculties cover bacteriology, mycology, parasitology, immunology, cytology, molecular

biology and applied microbiology.

Distinctive Features of Research

The research programs of the faculty in the Division reflect a variety of exciting areas of modern microbiology and immunology. Our faculties span a broad range of interests including nutrition immunology, parasitology, psychoimmunology, fungal genetics, medicinal fungus, application of probiotics, bacterial pathogenesis, signal transduction of inflammation, development of immuno-modulatory foods, gene therapy for asthma, evaluation of anti-tumor, anti-microbial, and anti-inflammation functions of natural products or synthetic chemicals, to name a few. Due to the interdisciplinary nature of these research interests, numerous collaborative efforts between our faculty and those in other divisions or other academic and industrial sectors have developed. Our Division is equipped with facilities such as refrigerated ultracentrifuge, fermentor, MACS separator, fluorescence microscope, phase-contrast inverted microscope, polymerase chain reaction thermal cycler, incubators, P2-level bacteriology laboratory and cell culture room to provide a good research atmosphere for students and faculties.

Prospect

Due to the fact that innovation of biotechnology is prompt and human are facing the challenging of new emerging infectious diseases, dissemination and promoting research of microbiology and immunology is crucial and imperative. Our forthcoming research will focus on the pathogenesis of microbes, new immunization technology, and application of probiotics in preventing and treating disease, hoping to uphold global health worldwide. (Ching-Hua Su, Director/Professor)

Division of Molecular Pharmacology

History and Overview

their research subjects the original five Graduate Institutes (the Basic Science Division of the Graduate Institute of Medical Sciences, the Division of basic Medical Science, the Graduate Institute of Cell and Molecular Biology, the Graduate Institute of Pharmacology, and the Graduate Institute of Neuroscience) were merged and named as the Graduate Institute of Medical Sciences in 2007. Currently, the Graduate Institute of Medical Science consists of five Divisions, including the Division of Microbiology and Immunology, the Division of Molecular Pharmacology, the Division of Biochemistry and Molecular Cell Biology, the Division of Cell Physiology and Neuroscience, and the Division of Medical Laboratory Science and Biotechnology. Division of Medical Laboratory Science and Biotechnology is one of the five divisions of Graduate Institute of Medical Science.

Goal of Education

We engage in biomedical basic research and application in the industrial circle. We offer perfect experimental facilities and operating environment, which enables students to understand in depth relevant knowledge, technical abilities and principles. The training will equip students with specialized skills in clinical medicine, biomedical research and biotechnology after graduating in the future.

Distinctive Features of Education

Curriculum

The teaching contains biochemistry, micro-biology, immunology, toxicology, examine instrument, reproduction medicine, pharmacology, cancer cell biochemistry and biotechnology production design etc.

Facilities

The present equipments are not second to the domestic and international first-class research institutions. They can be used in most advanced biological research work such as molecule biology, cell biology, blood, biochemistry,

bacterium, virus, tumor and immunity subjects, etc. Each instrument has its own full-time teacher to maintain and the instruments can be used by all teachers and students in the department. These novel equipments, in addition to the well designed curricula, are the best choice for the study of experimental medical sciences.

Faculty

More teachers will be employed, especially teachers with doctor degree in microorganism / blood specialty in order to strengthen the faculties.

Distinctive Feature of Research

We possess two potential research areas, i.e., the within-cell signal transduction mechanism and the development of clinical testing reagent. We have published over 40 SCI papers per year in recent years. The quality and quantity of research have generally improved over the past 3 years with average over 10 research projects per year. We have great progress in not only the number of research projects and awards from the National Science Council, but also in the publication of scientific papers. All these bring us not to second to the other medical colleges. In the future, we hope to combine talents in various fields, to create specialties of research and to have better research results.

Prospect

Services

Most of the staff from the division takes part in the administrative work, becomes part of the university committee, supervises at the university hospitals and provides clinical services. In addition to teaching and involving in clinical services, they also engage in outside-university organizations. After passed the law of medical technology, we are activating in organizing conferences in order to fulfill the requirements that all medical technologists have to accumulate additional 100 credits in every four years after graduating. The

University will fully support the research facilities to the division and students.

Faculty

Faculty members of Taipei Medical University having interests and expertise in neuroscience will join this training program.

Distinctive Features of Research

Our mission is to establish an internationally known Neuroscience unit of Taiwan via conducting original frontier neuroscience research of brain and mind. The challenging task of training young neuroscientists includes original thinking, lifetime learning and problem solving skills is critical for uncovering the neurodegenerative mechanism of progressive brain diseases and for improving diagnosing methods, preventing strategies, and treatment procedures. This brain division should perform research either independently or collaboratively with biotechnology industry locally and globally in developing new clinically useful neuroprotective drugs using integrated cell/molecular biological methods, animal models and double blind clinical trials with a goal for helping patients suffering degenerative brain diseases. We also collaborate with other neuroscience/brain research groups and institutes collegially improving Taiwan's international ranking in training, development, and research impacts. The faculty members are actively pursuing their research and intellectual interests, and are actively involved in collaborative researches. A laboratory rotation is designed to meet each student's needs and interests while providing a firm foundation in the broad research areas encompassing cellular, developmental, and molecular biology, and biochemistry. The division is currently organizing two core laboratories, which house a full range of facilities required for genomics and proteomics, molecular cloning and yeast two hybrid system. We anticipate considerable intellectual interactions and collaborative researches in the core laboratories.

Prospect

Services

We have established integrative researches in Neuroscience in multidiscipline fields.

Career development

We will educate the graduates to be the superior teachers and researchers.

International activities

International scholars will be constantly invited to present their researches. Additionally, faculty members and graduate students in this division will be encouraged to participate international activities.

(Yi-Hsuan Lee, Director/Professor)

Division of Medical Laboratory Science and Biotechnology

History and Overview

The Faculty of Medical Technology (FMT) was founded in 1965, with a total of 39 years of history. Since 1996, FMT enrolls part-time students to the Program of Advanced Diploma and provides academic credits for Continuing and Extension Education. The FMT is as youthful and active as the 1960-founded Taipei Medical University, which helps expanding the model of the faculty as well as creating for itself a positive reputation.

The Graduate Institute of Biomedical Technology (GIBT) was founded in 1987. GIBT combines the knowledge of medical fundamentals and applied technology. The aim of GIBT is to create high-level and professional biomedical technicians who will contribute to medical organizations and the development of related medical technology research in order to upgrade the country's medical treatment as well as to improve the health of all nations. To integrate the resources, to increase the collaboration, and to offer the graduate students with more opportunity in decision of

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Prospect

Services

All regular faculty members teach in both graduate and undergraduate programs and are active in the continuing education. The division offers a variety of continuing education programs and special training program for college graduates. We offer special training programs in "Biotechnology" and in "genomics and proteomics" in summers. The curriculum of the special training program of "Genomics and Proteomics" includes Genomics, Analysis for gene expression, Transcriptional factor array, Proteomics and Protein expression.

Career development

The graduates are competitive in both the academic and industrial arena.

International academic activities

Scholars from different countries are constantly invited to present their research data. Additionally, faculty members and graduate students are encouraged to participating international academic activities.
(Chwen-Ming Shih, Director/Associate Professor)

Division of Cell Physiology and Neuroscience

History and Overview

The Graduate Institute of Neuroscience is established in 2005. To integrate the resources, to increase the collaboration, and to offer the graduate students with more opportunity in decision of their research subjects the original five Graduate Institutes (the Basic Science Division of the Graduate Institute of Medical Sciences, the Division of basic Medical Science, the Graduate Institute of Cell and Molecular Biology, the Graduate Institute of Pharmacology, and the Graduate Institute of Neuroscience) were merged and named as the Graduate Institute of Medical Sciences in 2007. Currently, the Graduate Institute of Medical Science consists of five Divisions, including the Division of Microbiology and Immunology, the Division of Molecular Pharmacology, the Division of Biochemistry and Molecular Cell Biology, the Division of Cell Physiology and Neuroscience, and the Division of Medical Laboratory Science and Biotechnology. Division of Cell Physiology and Neuroscience is one of the five divisions of Graduate Institute of Medical Science.

Goal of Education

The main goal is to teach students with a solid knowledge background in neurosciences, an independence of mind, creative ability, motivation for life-time learning, and a capability of solving problems.

Distinctive Feature of Education

Curriculum

The courses include three parts: core courses, optional courses, and seminar. After this training program, the student is expected to apply their knowledge to study the mechanisms underlying of brain diseases and to develop the strategies for diagnosis, prevention, and therapy.

Facilities

The Brain Research Center, Stroke Center and Common Facility Center of Taipei Medical

graduate students with more opportunity in decision of their research subjects the original five Graduate Institutes (the Basic Science Division of the Graduate Institute of Medical Sciences, the Division of basic Medical Science, the Graduate Institute of Cell and Molecular Biology, the Graduate Institute of Pharmacology, and the Graduate Institute of Neuroscience) were merged and named as the Graduate Institute of Medical Sciences in 2007. Currently, the Graduate Institute of Medical Science consists of five Divisions, including the Division of Microbiology and Immunology, the Division of Molecular Pharmacology, the Division of Biochemistry and Molecular Cell Biology, the Division of Cell Physiology and Neuroscience, and the Division of Medical Laboratory Science and Biotechnology. Division of Biochemistry and Molecular Cell Biology in one of the five divisions of Graduate Institute of Medical Science.

Goal of Education

Our research and teaching are focused on studying the nature of various living processes at cellular and molecular level, and aimed to develop new medical and therapeutic biotechnology. Both basic and applied sciences are equally emphasized in the institutional teaching and research activities. The goals re set to promote domestic biomedical and biotechnological teaching, research and development, to facilitate the international academic information exchange, and to inspire the application of advanced knowledge and technology in biomedical sciences and biotechnology.

Distinctive Features of Education

Curriculum

To strengthen students' basic training, academic potential and biotechnological skill development, a separate core curriculum in cell and molecular biology and seminars are offered to students in either MS or Ph.D. program. The core curriculums are 14 credits for MS program

and 20 credits for Ph.D. program.

Facilities

There are state-of-the-art facilities for teaching and research activities of all the faculty and graduate students. Facilities for cell culture, cell & molecular analyses of various cell types and tissues are available as follows: *Cell Biology*: cell culture facilities, flowcytometers & sorter, fluorescence microscope and accessories, invert microscope, centrifuges of various speeds and rotors etc. *Molecular Biology*: PCR apparatus, rotary hybridization oven, gene pulser, autoradiographer, molecular modeling system, DNA sequencers etc. *Biochemistry*: various chromatography automation systems and NO-analyzer, electron spinning resonance, atomic absorption analyzer, FITR, GC mass-spectrometer, NMR-500Mhz etc available in Instrumentation Center of Taipei Medical University. These facilities greatly enhance the scope and facilitate the progress of research and training activities in the institute.

Faculty

Besides full-time faculty members, there are adjoin faculty members with specialty related to cell and molecular biology in various disciplines at Taipei Medical University. In addition, another adjoin faculty members are from the Institute of Molecular Biology, Academia Sinica. All faculty members participate in course and research activities according to their specialty.

Distinctive Features of Research

This division provides balanced academic and applied biotechnology training in biomedical field including basic life sciences, regenerative medicine and therapeutic medical development etc. The current research topics include: stem cell biology and technology, receptor biology and signal transduction, tissue regeneration and engineering, neuroendocrine-immune interaction, proteomics, protein engineering, molecular regulation of gene expression, and the structure-function relationship of proteins.

The orientation of our goal is contingent upon the main research goals of our university such as cardiovascular and thrombus studies, natural products in Chinese medicine, the development and study of functional mechanisms in synthetic medicine. In accordance with clinical and pharmacological studies we also strive to strengthen the application of such studies.

Middle and long term research plan:

With the use of cloning and transfection genome-based biotechnology, we examine the different functions and effects of the target genetic polymorphism. Investigate vector transfection techniques, to better express or suppress specific genes in order to evaluate the effects of drug treatment on genes.

Currently, the main areas of research within the faculty are the effects and mechanisms of medication on cardiovascular, hepatic, respiratory systems, cancer, and inflammation. The results of our research have been published in numerous journals. The future direction is dependent upon the research orientation of our university, such areas include cardiovascular and thrombus studies, the development and effects of natural products in Chinese medicine or synthetic medicine. Further, in response to clinical and pharmacological studies, we also strive to improve the application of such studies.

Prospect

Services

The majority of our professors participate in external organizations such as the Taiwan Pharmacology Academic Society, Taiwan Medicine, and International Academic Societies of Physiology, Oncology, Radiology, Anesthesia, Internal Medicine, etc.

Employment and Continuing Education

Graduates of our master's program have the capacity of pursuing careers in the academia of pharmacology, teaching in medical organizations, clinical and related research

careers. They are also able to apply for a doctorate program in the biomedical sciences. They also have the opportunity to engage in the development of life sciences, pharmaceuticals production, and life science pharmacological technology.

International Academic Interaction

We plan on broadening our collaboration with numerous research units in Taiwan, USA China, Japan and other countries. We hope that such interactions will include our students enrolled in the master's program so that we may conduct student exchange programs. We had a short term exchange medical student from Austria who is in the field of cardiovascular inflammation studies. We also have international exchange visiting students from Spain and France, etc.

(Joan-Rong Sheu, Director/Professor)

Division of Biochemistry and Molecular Cell Biology

History & Overview

The Graduate Institute of Cell and Molecular Biology (ICMB) was established in 1994. The ICMB is committed to excellence in research as well as in teaching of the future academic and research professionals in the field of biomedical, therapeutic and life sciences. To promote domestic biomedical and biotechnological research and development, to facilitate the international academic information exchange, and to inspire the application of advanced knowledge and technology in biotechnology and biomedical sciences are the goals of this institute. There is a collaborative training program with Academia Sinica. The great majority of the tenured and adjoined faculties of this institute were trained abroad. The institute provides an excellent environment, and offers MS and Ph.D. training programs for devoted scientists in various fields of cell and molecular biology. To integrate the resources, to increase the collaboration, and to offer the

Graduate Institute of pharmacology was established in 2002, and our graduate students are supervised by teachers from the School of Medicine, Department of Pharmacology. Our main goal is to educate professional researchers in the field of pharmacology, and to promote mechanism studies in our school. To integrate the resources, to increase the collaboration, and to offer the graduate students with more opportunity in decision of their research subjects the original five Graduate Institutes (the Basic Science Division of the Graduate Institute of Medical Sciences, the Division of basic Medical Science, the Graduate Institute of Cell and Molecular Biology, the Graduate Institute of Pharmacology, and the Graduate Institute of Neuroscience) were merged and named as the Graduate Institute of Medical Sciences in 2007. Currently, the Graduate Institute of Medical Science consists of five Divisions, including the Division of Microbiology and Immunology, the Division of Molecular Pharmacology, the Division of Biochemistry and Molecular Cell Biology, the Division of Cell Physiology and Neuroscience, and the Division of Medical Laboratory Science and Biotechnology. Division Molecular Pharmacology is one of the five divisions of Graduate Institute of Medical Science.

Goal of Education

Accommodate the development of Taiwan's biotechnology and pharmaceutical manufacture.

Collaboration with clinical medical units.

Cultivate professionals in the development of pharmaceuticals and evaluation of the efficiency of drugs in order to accommodate the demands of our country and our society.

Elevate the level of education and research in pharmacology, strengthen the learning capacity and discussion of our students.

Distinctive Features of Education

Curriculum

In accordance with clinical developments, our

courses employ a heuristic mode of teaching and encourage students pose questions. Our courses guide our students step by step towards the theories and practical operation of pharmacology research. Our students are also required to take elective courses in order to enable them to develop an independent interest in research, so that they may be capable of problem solving. We also strive towards the education of pharmacology and to strengthen the cultivation of our faculty.

Facilities

In order to cultivate professionals in pharmaceuticals, and to elevate the level of pharmacy development and mechanism exploration within our graduate students, the mandatory courses in our division are divided into the following 3 main sections: 1. Research Methods in Fundamental Pharmacology 2. Laboratory practice in General Pharmacology Studies 3. Research in Systemic Pharmacology

The facilities in our division include those in pharmacology, physiology, molecular biology, cell culturing, etc. There are over 100 instruments.

Faculty

Our division has many faculty members. Area of research are: cardiovascular pharmacology, molecular pharmacology, smooth muscle pharmacology, pulmonary pharmacology, natural therapy, food, nutrition and cancer, anticancer, Chinese herb medicines, inflammation and cardiovascular pharmacology, separation of natural products ingredients, tumor suppression, evaluation of strengthening of activity of immune system, fundamentals and clinical research of tumor radiotherapy, gene therapy, techniques in new drug treatment, medical equipment, experiment in drugs and clinical studies, hormones, blood kinetics, anesthesia, pain studies.

Distinctive Features of Research

supervisors in this division work toward a unified direction, each 'family' of the laboratory members communicates through Lab and Rotation, scheduled gatherings in order for the supervisors to understand problems arisen in the students' life. Through communication, too, the supervisors can counsel students to be more optimistic and hardworking.

Each academic level in this division (both bachelor and master levels) will be assigned one supervisor to provide counseling and help release any tensions in the daily life of every student. At least one gathering will also be held among the supervisors and students in each semester. The forms of the gatherings vary from outdoor activities to indoor restaurant meals, in which supervisors can talk to student heart-to-heart and assist students to accommodate research life.

Employment and continuing Education

We guided graduates to become researchers in the related fields. These graduates are always invited to join the alumni. Through participating in the institute's activities, good relationships are established among the former students. (Chien-Ho Chen, Director/Associate Professor)

臨床醫學研究所

簡史及概況

臨床醫學研究所前身為醫學研究所臨床組，在歷屆所長：蕭柳青教授、江漢聲教授、許準榕教授以及林建煌教授的領導下，建立了本所宏觀的架構。2006 年 10 月臨床醫學研究所由教育部核准成立，並於 2007 年 8 月正式獨立為臨床醫學研究所。

臨床醫學研究所成立之宗旨主要為培育臨床醫師具備傑出研究能力。由於臨床醫師在研究領域的表現越來越被重視，甚至成為評判其專業能力必備的條件。本所提供一系列的課程，讓臨床醫師在接受完整的訓練後，具有獨立進行研究與整合臨床與基礎研究議題之能力。並期許醫師能藉由研究工作的進行來解決臨床問題，提昇醫療品質促進社會福祉。

教學目標

培育優秀的醫師科學家(physician-scientists)研究人才。整合基礎醫學與臨床研究。提昇臨床醫師具臨床轉譯研究之能力。

教學特色

課程規劃

本所課程規劃主要著重於培養臨床醫師從事基礎醫學轉譯研究及臨床研究之能力。課程內容除「分子生物學」、「細胞生物學」及「應用生物統計學」等基礎醫學之課程外，更加強「臨床試驗」、「研究設計」、「基因醫學」以及「轉譯醫學」等課程，期許研究生能有效結合基礎與臨床醫學研究，培育具獨立思考且有創新研究能力之醫學研究人才。另為提昇學生研究水準，特別強化「進階論文寫作」以及「專題討論」課程，讓學生具備醫學研究必備之科學文章撰寫和資料整理能力。各教師依其所學專長及研究興趣，另開多樣性的選修課程供研究生修習，以拓展研究生的學識根基。

教學設備

除本所購置之筆記型電腦、單槍投影機...等一般的教學設備外，校方教務處、資訊處、教材教具中心亦有多項教學設備可提供師生於教學及研究上之使用。本所儀器設備包括分子生物、細胞培養、藥理、生理、組織等相關設備共約 130 項以上，另校方共同儀器中心及頂尖中風研究中心亦有高達 50 項以上之特定研究儀器設備，可提供本所師生使用。

師資

本所現有 10 位專任教師，其中有 6 位教授、2 位副教授、2 位助理教授，多為同時獲有醫學士及理學博士學位(M.D., Ph.D.)。本所除專任教師外，並合聘 70 名以上之醫學系臨床學科助理教授以上之專、兼任教師參與本所之教學研究工作，協助指導本所研究生。

研究特色

本所教師除了臨床工作外，亦投入相當心力於基礎與臨床研究整合，強調以基礎的方法解決臨床的問題。本所專任教師近三年(2006-2008)發表於國際學術期刊論文數達 64 篇，研究計畫數達 29 件；並持續成長中。

展望