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Doctor of Philosophy Program in Medical Anatomy (International Program)

Faculty of Medicine, Siriraj Hospital Department of Anatomy

Admission Requirements

A candidate must:

Plan 2

1. For applicant who holds Master's degree
 - 1.1 Graduated with Master's degree in Sciences, Medical Sciences, Physical Therapy, Sport Sciences, Nursing, etc. from institutes approved by the Higher Education Commission with minimum grade point average of 3.50.
 - 1.2 Provides at least two letters of recommendation issued by advisor or supervisor and/or the educational portfolio
2. For applicant who holds Bachelor's degree
 - 2.1 Graduated with Bachelor's degree or studying in the final year of Bachelor's degree of Medicine, Dentistry, Veterinary, Pharmacy, Sciences, Physical therapy or other related fields from institutes approved by the Higher Education Commission with minimum grade point average of 3.50
 - 2.2 Should have scientific knowledge and be capable of doing research in Anatomy.
3. Have a TOEFL ITP score of at least 500, TOEFL Internet-based score of 61 or IELTS score of 5. Those who do not have any of the test score specified above will have to take the English Proficiency Examination of the Faculty of Graduate Studies on the specified examination day

Exemption from the above conditions may be granted by the Programme Committee under exceptional circumstances.

Curriculum Structure

	Credit
For students with Master's degree	
Required Courses	6
Elective Courses no less than	6
Thesis	36
For students with Bachelor's degree	
Required Courses	22
Elective Courses no less than	2
Thesis	48

	Credit
Required Courses	
For students with Master's degree	
SIAN 608 Seminar in Medical Anatomy I	1(1-0-2)
SIAN 609 Seminar in Medical Anatomy II	1(1-0-2)
SIAN 610 Professional Skills and Teaching in Anatomy	1(0-2-1)
SIAN 614 Clinical Anatomy	2(1-2-3)
SIAN 617 Current Topics in Anatomy	1(1-0-2)
For students with Bachelor's degree	
SIAN 603 Developmental Biology	1(0-2-1)
SIAN 604 Neuroscience	2(1-2-3)
SIAN 605 Cell and Tissue	3(1-4-4)
SIAN 606 Human Anatomy I	4(2-4-6)
SIAN 607 Human Anatomy II	4(2-4-6)
SIAN 614 Clinical Anatomy	2(1-2-3)
SIID 501 Molecular and Cellular basis of Biomedicine	3(2-2-5)
SIAN 608 Seminar in Medical Anatomy I	1(1-0-2)
SIAN 609 Seminar in Medical Anatomy II	1(1-0-2)
SIAN 610 Professional Skills and Teaching in Anatomy	1(0-2-1)
Elective Courses	
SIRE 501 Statistics	3(3-0-6)
SIRE 502 Research Methodology	2(2-0-4)
SIAN 611 Advanced Human Genetics	2(2-0-4)
SIAN 612 Laboratory Techniques in Medical Sciences	2(1-2-3)
SIAN 613 Biomechanics	2(2-0-4)
SIAN 615 Advanced Neuroanatomy and Neuropathology	2(2-0-4)
SIAN 616 Histopathology	2(1-2-3)
Thesis	
For students with Master 's degree	
SIAN 699 Dissertation	36(0-108-0)
For students with Bachelor's degree	
SIAN 799 Dissertation	48(0-144-0)
* These may be changed in case of curriculum revision	

Areas of study that a student may select for concentration:

1. Gross Anatomy
2. Microanatomy
3. Embryology
4. Neuroanatomy
5. Molecular biology
6. Physical Anthropology

Additional advantages of the program

The department of Anatomy has facilities for carrying out research activities in various fields in anatomy as well as soft cadavers for biomechanics research. The program has emphasized on anatomical researches which can be applied to medical sciences.

Details of Scholarships

- Graduate Scholarships
- Siriraj Graduate Scholarships

Proposal / Concept Paper**Anatomy field**

Structure of organ always relates to its functions or vice versa, this is also true for the musculoskeletal system. Knowledge of bony structure is indeed needed in various fields such as orthopaedics, prosthesis design, biomechanic study, kinesiology, forensic sciences, and anthropology. Shape variation of bones, particular foot bones can lead to the etiology of foot problem and explain the underlying mechanism in biomechanics ground. The appropriate designed prosthesis will give the better off surgical intervention and patient quality of life. Thus the knowledge of bony shape is essential for biomedical field. Study of bony shape has been done by linear measure of its dimension and expressed shape as index or aspect ratio, however still lacking the real information of shape.

Geometric morphometrics is a branch of morphometry which is a valuable and non-expensive method to study the shape of any object. Thus, shape of various parts of human skeletal are studied and reveal the different of between sides and gender. The difference in some part of the bone will imply the different pulling force of the muscle such as the greater trochanter. The musculoskeletal research group in the department of Anatomy aims to study the variation shape of skeletal in relation to its biomechanic function and also the etiology of particular injury

Microanatomy field

Diabetes mellitus (DM) is an increasing prevalent disease in the world. It afflicts a large number of people from all social groups throughout the world. The DM complications, including retinopathy, nephropathy and neuropathy, associate with dysregulations of a number of systems in the body such as vascular, nervous, endocrine, musculoskeletal, digestive, and urogenital systems. Many researchers have studied the physiological and biochemical changes of various systems in the DM. However, few studies have been performed to demonstrate the morphological alterations of various organs/ structures in the DM. In addition, the data concerning microvascular architecture of various organs in the DM is obscure. The results of the limited numbers of morphological and microvascular studies are contradictory in some aspects, thus the need for further ultrastructure and microvascular studies were suggested. Accordingly, the scope of our currently work was to establish the morphological alterations of various organs/ structures in both short-term

and long-term diabetes by using light microscopy (LM) and transmission electron microscopy (TEM). Additionally, microvascular changes in various diabetic organs/ structures were investigated by vascular corrosion cast technique in conjunction with scanning electron microscopy (SEM).

The study gives insights into a relationship between hyperglycemia and morphological alteration of the organ system in the progression of DM. If the structures of induced-diabetic organs have changed, it should be considered as a useful basic knowledge for future therapeutic treatment of diabetic patients to increase their life expectancy.

Embryology field

Nowadays several chemicals/drugs are manufactured to serve need of people such as insecticide, herbicide or other important drug such as valproic acid (anticonvulsive drug). Their usages are not well caution resulting in residues in natural and harmful to human and animals and adversely affect to ecosystems. Tests for chemicals/drugs effect to pregnant women are very few so these studies were conducted to screen the teratogenic effect of chemicals/drugs by using in ovo chick embryo as an animal model.

The positive results can be further studies in other mammals because chick embryo in ovo was proved to be more advantage in their short gestation, low price, easily handling, commercially available and more database were already studied compared to human. The Chick in ovo for Teratogen Screening Center (CIOTS) aims to study the teratogenic effect of several chemical and/or drug by using chick in ovo model.

Neuroanatomy field

Neuroscience laboratory has been largely related to Regeneration and Neurodegenerative diseases in animal models (rat) and trying to understand the neural bases of the injury using morphological, biochemical and behavioral determinations in both motor and sensory function tests.

By studying peripheral nerve injury such as sciatic nerve crush, tibial and peroneal nerve transections, using sciatic functional index (SCI) resulted from foot print task after walking tract analysis and the morphometric analysis of the axon regeneration done by N-CAM immunofluorescence staining. Thai herbal medicine which is nerve regeneration promotor also used to investigate effects on the nerve injury in rats.

Spinal cord injury animal model, rat and mice, this research has been conducted in collaborative with Physiological department and Department of Physical Medicine and Rehabilitation, University of Alabama at Birmingham (UAB), USA, the study has been determined the effect of estrogen in neuroprotection, the promising effect of Schwann cell culture in CNS regeneration and the skilled and unskilled motor behavioral task for the evaluation of recovery function after injury. Other interesting area of research was global cerebral ischemic model and the neuroprotection effects of some herbal nutrition.

Molecular biology field

Dengue fever (DF) and dengue hemorrhagic fever (DHF) are important public health problems in tropical and subtropical regions. Infection with dengue virus (DENV) produces variable clinical illness ranging from nonspecific viral symptoms to fatal hemorrhagic disease. Presently, there are no effective vaccine and drugs against DENV. The current research projects focus on identification of host proteins required for dengue virus replication, and viral-host interaction in dengue virus-mediated apoptosis.

Another field of interest is regulatory RNA which is a classification of non-coding RNAs (ncRNAs) revealed from the presence of plenty amount of non-coding transcripts in genome-wide transcriptome study. They are classified according to their sizes from small to long ncRNAs and play crucial roles in genome regulation other than proteins as canonical regulators of gene expression. A large growing

number of studies have shown that ncRNAs mediate genome regulation via several molecular mechanisms giving rise to proper and precise genomic function spatially and temporally. Interestingly, disruption of these mechanisms lead to several human diseases, particularly cancer. My research aims to focus on elucidating molecular disruption of ncRNA in both common inherited and non-inherited diseases which clinical spectrum remain unclear in molecular pathophysiological aspect. In addition, as ncRNAs have been found to function as key regulators for normal embryogenesis, underlying mechanism of improper control for specific gene expression in human morphogenesis will be studied to illustrate molecular pathogenesis in common human anomalies. Future therapies targeting in correction of ncRNA functional defect will be developed as a novel approach for ameliorating these human disorders.

Genetics field

The study of gene mutations in neurogenetic disorders by using denaturing high performance liquid chromatography (DHPLC) and DNA sequencing, including the study of protein structure and function.

Application Process

Application is only available via online application at www.grad.mahidol.ac.th

Required Documents

Prepare the following required documents to submit via online admission system or post:

1. Completed an Online Application at www.grad.mahidol.ac.th which comprised with
 - Form A** : Application Form
 - Form B** : Background and Proposed Field of Study
 - Form C** : Recommendation Forms (directly submitted by at least 2 referees)
2. Two copies of Degree Certificate (with officially certified English translation)
3. Two copies of Academic Transcript (with officially certified English translation)
4. Two copies of Recent Photos (Passport size)
5. Two copies of Passport
6. Two copies of English certificate (TOEFL/ IELTS/ MU-Grad Test)

(For Doctoral Program)

- TOEFL ITP score of at least 500, TOEFL Internet-based score of 61, or IELTS score of 5

(For Master's Program)

- TOEFL ITP score of at least 480, TOEFL Internet-based score of 54, IELTS score of 5 or MU GRAD TEST score of 60.

Notes

- Only accept TOEFL ITP score from examination center arranged by Faculty of Graduate Studies, Mahidol University.
 - TOEFL ITP taken from other domestic and overseas institutes are invalid.
 - The test date must be within previous 2 years before application date
 - Applicant who obtained a valid English score must submit an **official score certificate** along with your application. Otherwise, your English score will not be considered.
 - Detail of English Competency Standard for Admission:
<http://www.grad.mahidol.ac.th/en/current-students/language-center.php>
7. Two copies of Curriculum Vitae
 8. Two copies of Statement of Purposes and Career Goals
 9. Two copies of Current bank statement / Scholarship letter (if any)
 10. Two copies of Concept paper / research proposal (recommended for all applicants)
 11. Two copies of additional documents may be requested by each program (such as letter of work experience / professional license/ related certificates and awards)

Submitting documents via online admission system.

- All documents must be in pdf format (maximum size 2 MB)
- Recent photograph must be in jpeg format only (maximum size 2 MB)

Job option after graduation

1. An expert in anatomy and medical anatomy in higher education.
2. Researcher in applied anatomy, medical sciences and health sciences.
3. Academician in university.

Further information may be obtained from the Director of Graduate Studies, Medical Anatomy :

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Notes 1. For more education information : <http://www.grad.mahidol.ac.th>

<p>For more Information please contact The Student Admissions Section. Tel . 0 2441 4125 ext. 208-210, 0 2441 9129, E-mail : gradinter@mahidol.ac.th</p>
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