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Doctor of Philosophy Programme in Anatomy and Structural Biology (International Programme)

หลักสูตร ปรัชญาดุษฎีบัณฑิต สาขาวิชา กายวิภาคศาสตร์และชีววิทยาโครงสร้าง (หลักสูตรนานาชาติ)(ภาคปกติ)

Faculty of Science

Department of Anatomy

คณะวิทยาศาสตร์

ภาควิชา กายวิภาคศาสตร์

Expected number of students to be accepted all year round : 10 Students

#### Admission Requirements

A candidate must:

Candidate with the Master's degree :

1. Must hold Master degree of Science
2. Have a minimum grade point average of 3.50
3. Submit a certificate of English proficiency with minimum admission score:
  - IELTS - at least 3 or
  - TOEFL INTERNET BASED - at least 32 or
  - TOEFL ITP (test arranged by Faculty of Graduate Study, Mahidol University) - at least 400

#### Important Notes:

- English proficiency score must be taken within 2 years up to the admission date.
  - Application without submitting a valid English certificate will NOT be considered.
  - MU English Competence Standards: [www.grad.mahidol.ac.th](http://www.grad.mahidol.ac.th)
  - MU English proficiency tests, please contact the Language Center, Faculty of Graduate Studies.  
Tel. 0-2441-4125 ext. 221-222
4. Exemption from the above conditions may be granted by the Programme Committee under exceptional circumstances.

#### Candidate with the Bachelor's degree:-

1. Must hold Bachelor degree of Science or any equivalent degree with at least second class honor, or hold M.D., DVM., or DDS
2. Submit a certificate of English proficiency with minimum admission score:
  - IELTS - at least 3 or
  - TOEFL INTERNET BASED - at least 32 or
  - TOEFL ITP (test arranged by Faculty of Graduate Study, Mahidol University) - at least 400

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Tel. 0-2441-4125 ext. 221-222
3. Exemption from the above conditions may be granted by the Programme Committee under exceptional circumstances.

## Written Examination

There is NO written examination for this program. Applicants must check their eligibility for interview upon the announcing date of the interview list which is scheduled for each admission round.

## Curriculum Structure

	Credit
<b>Plan 2</b>	
<b>For students with Master Degree in Anatomy or Anatomy and Structural Biology</b>	
Required courses	7
Elective courses not less than	5
Dissertation	36
<b>For student with Master degree in other related fields</b>	
Required courses	11
Elective courses not less than	5
Dissertation	36
<b>For students with Bachelor Degree</b>	
Required courses	20
Elective courses not less than	5
Dissertation	48
<b>For student with M.D., DVM. and DDS.</b>	
Required courses	12
Elective courses not less than	12
Dissertation	48

**Credit****Required Courses****For students with Master Degree in Anatomy or Anatomy and Structural Biology**

SCAN 604	Current Topics in Cellular and Structural Biology	1(1-0-2)
SCAN 616	Current Topics in Neuroscience	1(1-0-2)
SCAN 617	Seminar in Frontier Research of Anatomy and Structural Biology I	1(1-0-2)
SCAN 618	Seminar in Frontier Research of Anatomy and Structural Biology II	1(1-0-2)
SCAN 619	Seminar in Frontier Research of Anatomy and Structural Biology III	1(1-0-2)
SCID 502	Cell Science	2(2-0-4)

**For student with Master degree in other related fields**

SCAN 502	Structural Neurobiology	3(2-3-5)
SCAN 522	Structural Biology of Cell and Tissue	3(2-3-5)
SCAN 604	Current Topics in Cellular and Structural Biology	1(1-0-2)
SCAN 617	Seminar in Frontier Research of Anatomy and Structural Biology I	1(1-0-2)
SCAN 616	Current Topics in Neuroscience	1(1-0-2)
SCAN 618	Seminar in Frontier Research of Anatomy and Structural Biology II	1(1-0-2)
SCAN 619	Seminar in Frontier Research of Anatomy and Structural Biology III	1(1-0-2)

**For students with Bachelor Degree**

SCAN 502	Structural Neurobiology	3(2-3-5)
SCAN 520	Human Structure and Development	3(3-0-6)
SCAN 521	Human Gross Anatomy Dissection	2(0-4-2)
SCAN 522	Structural Biology of Cell and Tissue	3(2-3-5)
SCAN 604	Current Topics in Cellular and Structural Biology	1(1-0-2)
SCAN 617	Seminar in Frontier Research of Anatomy and Structural Biology I	1(1-0-2)
SCAN 616	Current Topics in Neuroscience	1(1-0-2)
SCAN 618	Seminar in Frontier Research of Anatomy and Structural Biology II	1(1-0-2)
SCAN 619	Seminar in Frontier Research of Anatomy and Structural Biology III	1(1-0-2)
SCID 502	Cell Science	2(2-0-4)
SCID 514	Animal Experimentation in Biomedical Research	1(0-2-1)
SCID 518	Generic Skills in Science Research	1(1-0-2)

**For student with M.D., DVM. and DDS.**

SCAN 604	Current Topics in Cellular and Structural Biology	1(1-0-2)
SCAN 617	Seminar in Frontier Research of Anatomy and Structural Biology I	1(1-0-2)
SCAN 616	Current Topics in Neuroscience	1(1-0-2)
SCAN 618	Seminar in Frontier Research of Anatomy and Structural Biology II	1(1-0-2)
SCAN 619	Seminar in Frontier Research of Anatomy and Structural Biology III	1(1-0-2)
SCID 502	Cell Science	2(2-0-4)
SCID 503	Systemic Bioscience	3(3-0-6)
SCID 514	Animal Experimentation in Biomedical Research	1(0-2-1)
SCID 518	Generic Skills in Science Research	1(1-0-2)

### **Elective courses**

SCAN	517	Gross Anatomy Dissection for Clinical Application	1(0-3-1)
SCAN	607	Advanced Microscopy and Structural Biology	2(1-2-5)
SCID	506	Concepts of Molecular Bioscience	2(2-0-4)
SCID	507	Microscopic Techniques	1(0-2-1)
SCID	508	Biomolecular and Spectroscopic Techniques	1(0-2-1)
SCID	509	Separation Techniques	1(0-2-1)
SCID	510	Immunological Methods	1(0-2-1)
SCID	511	Gene Technology	1(0-2-1)
SCID	513	Animal Cell Culture Techniques	1(0-2-1)
SCID	516	Biostatistics	3(3-0-6)
SCID	531	Microcomputer Applications	3(3-0-6)
SCID	532	Computer Programming	3(3-0-6)
SCID	533	Data Processing	3(3-0-6)
SCBC	610	Modern metabolism	2(2-0-4)
SCBC	611	Current Protocols in Biomolecular Research	1(1-0-2)
SCBT	502	Recombinant DNA Technology	3(2-3-5)

### **Dissertation**

SCAN	699	Dissertation	36(0-108-0)
SCAN	799	Dissertation	48(0-144-0)

\* These may change in cases where there are suggestions for the improvement of the curriculum

### **Areas of research that a student can select for his / her research Thesis / Dissertation**

#### **1. Structural Cell and Molecular Biology**

1. Shrimp biotechnology.
2. Virus and host interaction in shrimp.
3. Characterization of molecules involved in aquatic animal adaptation and excretory system.
4. Cell surface ligand-receptor interaction.
5. Molecular studies on dengue-2 virus and their variants

#### **2. Neuroscience**

1. Cellular and molecular mechanisms of neurodegeneration.
2. The roles of astrocyte and microglia in neuroprotection and neurotoxicity.
3. Synaptic plasticity and brain development.
4. Neuroendocrine control of growth and reproduction in mollusks and crustaceans.
5. Identification and mapping of neurotransmitters and corresponding receptors that are involved in the reproductive controls in the central nervous system of crustaceans and abalone.
6. Pathogenesis of motor neuron degeneration.
7. Gene expression profiling in neurological disorders.

### **3. Stem Cell Biology and Embryo Technology in mammal**

1. Embryonic stem cell research on proliferation and differentiation.
2. Stem cells for cell therapy.
3. Tissue engineering and transplantation for hearing research.
4. Bone-marrow mesenchymal stem cells for treatment of stroke.
5. Animal gamete and embryo technology : in vitro embryo production, nuclear transfer, cryopreservation and genetic manipulation.
6. Transgenic animal models for diseases.

### **4. Reproductive Biology and Neuro-endocrinology of economic mollusks and crustaceans**

1. Endocrine manipulation of the reproductive process for increased production in abalone and economic crustaceans.
2. Characterization and distribution of reproductive neuropeptides and hormones in abalone and economic crustaceans.
3. Reproductive biotechnology in shrimp.
4. Molecular mechanisms of gamete maturation, capitation, and fertilization.
5. Gamete membrane molecules and signal transduction during fertilization.
6. Genetic manipulation for enhancing reproduction of aquatic animals.
7. Cryopreservation of gamete and larvae of polychaete, *Perinereis nuntia*.
8. Cryopreservation of gametes and embryos of abalone and prawn.

### **5. Development of immunodiagnosis, drugs and vaccines for fasciolosis and schistosomiasis**

1. Development of immuno-diagnosis and vaccine for fasciolosis.
2. Drug discoveries from natural bioactive compounds for trematode and nematode parasites.
3. Using *Caenorhabditis elegans* model organism in studying parasitic diseases.

### **6. Cancer Research**

1. Cell-matrix interaction: signaling involved cell migration, cancer invasion and metastasis.
2. Analysis of translation elongation factor 1A2 (*EEF1A2*) genes in various cancers.
3. Antiviral and anticancer effects of medicinal herbs.

### **Additional advantages of the programme**

Graduate students in M.Sc. and Ph.D. programmes can select their research topics from a wide variety of ongoing research both in the Department of Anatomy and in the Center of Excellence.

Most doctoral students will get scholarships and / or research assistantships. In addition, most will have a chance to go abroad as part of his / her research and work at a renowned university for at least 7 months to 1 year.

Market demand for graduates from our programmes is high in both government and private universities. Graduates will be trained to be professional in both teaching and research skills.

## **Details of Scholarships**

1. Royal Jubilee Scholarship.

## **Application Process**

Application is only available via online application at [www.grad.mahidol.ac.th](http://www.grad.mahidol.ac.th)

## **Proposal / Concept Paper**

Foreign applicants have to attach a proposal or concept paper regarding research field of interest and a short plan of research.

## **Required Documents**

Applicants must upload all documents via online admission system. All documents must be in PDF format (maximum size 2 MB). Photograph must be in JPEG format.

- Recent photographs (1x1 inch in size)
- A copy of an applicant's degree certificate or a letter of graduation certification (for an applicant with a degree completion)
- A letter certifying that an applicant is currently in the final year prior to graduation (for an applicant seeking for a degree)
- A detailed transcript of a degree (for an applicant with a degree completion)
- A grade report with course names and grades received from the first to the current semester prior to graduation
- A copy of identification card
- A copy of house registration certification
- A copy of Certificate of English proficiency : IELTS / TOEFL INTERNET BASED / TOEFL ITP
- A copy of proof of payment.

## **Job option after graduation**

1. Expert researcher in Anatomy and Structural Biology
2. Consultant in Anatomy and Structural Biology in local or foreign institutes
3. Researcher in biomedical science and agricultural science

**Further information may be obtained from the Director of Graduate Studies,**

**Department of Anatomy :**

1. **Assoc.Prof. Permphan Dharmasaroja (E-mail : [permphan.dha@mahidol.ac.th](mailto:permphan.dha@mahidol.ac.th))**

Room B118, B Building, Floor 1,

Department of Anatomy, Faculty of Science

Tel. : 0 2201 5409 Fax. : 0 2354 7168

2. **Asst.Prof. Krai Meemon** (E-mail : [krai.mee@mahidol.ac.th](mailto:krai.mee@mahidol.ac.th))

Room B126, B Building, Floor 1,

Department of Anatomy, Faculty of Science

Tel. : 0 2201 5417 Fax. : 0 2354 7168

**Notes**

1. The programme of Anatomy and Structural Biology requires students study the pre - requisite courses:
  - SCID 500 Cell and Molecular Biology 3 Credits
2. For more education information : [www.grad.mahidol.ac.th](http://www.grad.mahidol.ac.th)

**For more Information please contact The Student Admission Section.  
Tel . 0 2441 4125 ext. 208-210 , 0 2441 9129, E-mail : [gradthai@mahidol.ac.th](mailto:gradthai@mahidol.ac.th)**