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

Faculty of Science

Department of Anatomy

### 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. Have a TOEFL ITP score of at least 500, TOEFL Internet-based score of 61 or IELTS score of 5 .

Exemptions 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. Have a TOEFL ITP score of at least 500, TOEFL Internet-based score of 61 or IELTS score of 5 .

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

### 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>Credit</b>
<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

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

Required courses	12
Elective courses not less than	12
Dissertation	48

	<b>Credit</b>	
<b>Required Courses</b>		
<b>For students with Master Degree in Anatomy or Anatomy and Structural Biology</b>		
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)
<b>For student with Master degree in other related fields</b>		
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)
<b>For students with Bachelor Degree</b>		
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)
<b>For student with M.D., DVM. and DDS.</b>		
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)
<b>Elective courses</b>			
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)
<b>Dissertation</b>			
SCAN	699	Dissertation	36(0-108-0)
SCAN	799	Dissertation	48(0-144-0)
<b>* These may change in cases where there are suggestions for the improvement of the curriculum</b>			

## 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, capacitation, 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, *Perineresis 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

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

1. Completed an Online Application at [www.grad.mahidol.ac.th](http://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. 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))  
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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 : [gradinter@mahidol.ac.th](mailto:gradinter@mahidol.ac.th)