Choosing a graduate program is one of the most important decisions you will make in your life. Then, why should you choose MOLECULAR AND CELL BIOLOGY PROGRAM? Because it is a SMART choice.

**Support** that encompasses both academic and living needs.
1. The supportive faculty strives to mentor young scientists and provide strong career foundations.
2. Supportive staff works to facilitate student interactions, and to make them feel at home at the institute and in Taipei. Finally, the MCB TIGP program provides competitive financial support, including low tuition fees and access to the medical care as well as grants to support students’ research, living, and conference travel costs.

**Molecular biology** training that is both comprehensive and integrative.
Students in TIGP MCB program receive a solid foundation in every aspect of molecular biology and are given opportunities to apply their knowledge to a diverse array of research fields.

**Accessible** faculty who strive to train the next generation of scientists.
Whether in the lab or in the classroom, TIGP-MCB program gives students access to nationally and internationally recognized professors at Academia Sinica and the National Defense Medical Center.

**Resources** encompassing everything from technical support in cutting-edge technologies and facilities to assistance with scientific writing and communication ensure that students receive comprehensive help in achieving their research and academic goals.

**Taipei** offers all the conveniences of a global, cosmopolitan city while remaining accessible, friendly, and one of the safest cities in the world.

The “SMART” training provided in the MCB program which are sponsored by the Institute of Molecular Biology (IMB), Academia Sinica in cooperation with the Institute of Life Sciences (ILS), National Defense Medical Center will help you build up your professional career.

**Research Interests**
The MCB program has about 40 faculty members; most have been trained in internationally highly regarded universities with extensive ties with global scholars. The research conducted by the faculty of MCB program covers a wide range of topics in basic researches with great potential of applications.


- Developmental Biology
- RNA Biology
- Structural Biology
- Infection and Immunobiology
- Chromosome Biology
- Neuroscience
- Plant Biology
- Systems Biology
**Research Resource**

In MCB program, high-quality research core facilities are equipped and feasible for each graduate student in the labs. Core facilities include transgenic mouse, transgenic fly, electron microscopy, confocal microscopy, X-ray crystallography, mass spectroscopy, microarray, electrophysiology, FACS and so on. Academia Sinica has an excellent Biological Sciences Library, with a large collection of books and research journals, as well as e-journals available on-line through the library. In addition, Public Service such as computer and printer facility, English Editor and Bioinformatics are used to support the in-campus research activities.

**Faculty Members**

**Academia Sinica**

**Institute of Molecular Biology**

**Wen Chang**
Ph.D., Microbiology and Immunology, University of Washington-Seattle, USA
Molecular mechanism of vaccinia virus entry into mammalian hosts
Cellular defense mechanisms and viral host range genes antagonizing host restriction

**Yu-Chan Chao**
Ph.D., Virology/Entomology, University of Arkansas, USA
Baculovirus gene regulation and protein engineering; pseudotyped influenza virus studies and applications

**Hung-Ta Chen**
Ph.D., Chemistry, University of Georgia, USA
Mechanisms of RNA polymerase II and III transcription

**Jun-An Chen**
Ph.D., the Wellcome Trust Gurdon Institute, Univ of Cambridge, UK
Interrogating neural development and degeneration by ES cells

**Jychian Chen**
Ph.D., Biological Sciences, Washington University in St. Louis, USA
Genetic and molecular analysis of Arabidopsis carbohydrate metabolic mutants, regulation and function of carbohydrate metabolic genes in plants

**Liuh-Yow Chen**
Ph.D., Biochemistry & Molecular Biology, Baylor College of Medicine, USA
Telomere Biology and Telomere Diseases

**Pei-Lin Cheng**
Ph.D., Biochemistry, National Yang-Ming University, Taiwan
Mechanisms of neuronal polarization and regeneration

**Soo-Chen Cheng**
Ph.D., Biochemistry, Duke University, USA
Molecular mechanism of pre-mRNA splicing

**Cheng-Ting Chien**
Ph.D., Biochemistry and Cell Biology, Stony Brook University, USA
Dendrite arborization in development and diseases
Synapse formation and plasticity

**Huai-hu Chuang**
Ph.D. in Biomedical Sciences, University of California, San Francisco, USA
Receptor and Channel Function

**Bon-chu Chung**
Ph.D., Biochemistry, University of Pennsylvania, USA
Steroid Regulation, Zebrafish Development, Disease Model, Gene Regulation

**David C-D Hsiao**
Ph.D., Biological Crystallography, University of Pittsburgh, USA
Structural and functional study of protein-DNA and protein-protein interaction by X-ray crystallography

**Yi-Ping Hsueh**
Ph.D., Microbiology and Immunology, National Yang-Ming University, Taiwan
Neuronal Morphogenesis
Neurodevelopmental disorders
Neurodegeneration

**Der-Hwa Huang**
Ph. D., Biological Chemistry, Washington University, USA
Heterochromatin organization;
Chromatin remodeling in gene regulation
Chih-Yen King  
Ph.D., Biophysics, Harvard University, USA  
Molecular biology of amyloid and prions  
Structural principle of amyloids  

Jun-Yi Leu  
Ph.D., Molecular, Cellular, & Developmental Biology, Yale Univ., USA  
Yeast genomics and experimental evolution  
Cell-cell communication and gene network regulation  
Genetic and noise buffering  

Hsou-min Li  
Ph.D., Cell and Molecular Biology, Univ. of Wisconsin-Madison, USA  
Protein sorting within cells  
Developmental regulation of protein trafficking  

Nan-Shih Liao  
Ph.D., Biological Sciences, Illinois State University, USA  
Interleukin 15 in T and NK cell biology  
Intestine mucosal immunity  

Sue Lin-Chao  
Ph.D., Molecular and Cell Biology, the University of Texas at Dallas, USA  
Signal pathways govern the control of bacterial RNA degradation;  
Function of RNA degradosome components  
Function of growth-arrest genes during mouse brain development  
RNA biology  

Y Henry Sun  
Ph.D., Biology, California Institute of Technology (Caltech), USA  
Molecular mechanism of eye development in Drosophila  

Chin-Yin Tai  
Ph.D., Cell Biology, University of Massachusetts Medical School, USA  
Cellular mechanisms of morphological and synaptic plasticity in neurons  

Yi-Fang Tsay  
Ph.D., Biological Sciences, Carnegie Mellon University, USA  
Molecular mechanism of Nitrate signaling and transport in higher plants  

Ting-Fang Wang  
Ph.D., Biochemistry and Molecular Biology, Harvard University, USA  
Chromosome biology and fungal sexual development  

Huey-Nan Wu  
Ph.D., Biochemistry, University of Illinois, USA  
The molecular mechanism of flavivirus RNA replication: the role of viral RNA elements and virus nonstructural protein interactions  

Meng-Chao Yao  
Ph.D., Biology, University of Rochester, USA  
Gene amplification, deletion and rearrangements in eukaryotic cells  
The role of dsRNA in gene silencing, heterochromatin formation and DNA rearrangements  

Su-May Yu  
Ph.D., Plant Biology/Pathology, University of Arkansas, USA  
Mechanisms of sugar starvation signaling transduction and regulation of gene expression in plants;  
Rice functional genomics for discovery of genes controlling grain yield, stress tolerance, and nutrient utilization  

Hanna S. Yuan  
Ph.D., Chemistry, University of Southern California, USA  
Structural and functional studies of DNA and RNA metabolism  

Institute of Cellular and Organismic Biology  

Shen-Ju Chou  
Ph.D., Molecular and Cellular Biology, Baylor College of Medicine, USA  
Neural Development  
Cortical patterning
Ya-Hui Chou  
Ph.D., Institute of Life Sciences, National Defense Medical Center, Taiwan  
The development of olfactory local interneurons  
Neuronal diversity and variability; neuronal circuit function and insect behavior

Tao-shih Hsieh  
Ph.D., Biophysical Chemistry, University of California, Berkeley, USA  
Biochemical and cellular functions of DNA topoisomerase and helicases  
Single molecular analysis of enzyme-mediated DNA dynamics

Jr-Kai Yu  
Ph.D., Marine Biology Research Division, Scripps Institution of Oceanography, University of California, San Diego, USA  
Developmental mechanisms of the cephalochordate amphioxus

Genomic Research Center  
Tien-Hsien Chang  
Ph.D., Molecular Biology, State University of New York at Buffalo, USA  
Genome-wide bypass of essential genes  
Genome architecture  
Molecular mechanism of pre-mRNA splicing, mRNA export, and translation  
In vivo roles of DExD/H-box proteins in RNA metabolism

National Defense Medical Center  
Institute of Life Sciences  
Tsu-Chung Chang  
Ph.D., Biochemistry, University of Illinois, Urbana-Champaign, USA  
Regulation of gene expression and molecular action of steroid hormones

Earl Fu  
D.Sc.D. Oral Biology, Boston University, USA  
The mechanisms of gingival overgrowth; The pathogenesis of periodontal disease

Po-Shiuian Hsieh  
M.D., National Defense Medical Center, Taiwan;  
Ph.D., Molecular Physiology, Vanderbilt University, USA  
The casual relationship between inflammation and obesity-associated metabolic syndrome and diabetes mellitus  
The therapeutic approach to prevent and treat metabolic syndrome and type II diabetes

Shih-Ming Huang  
Ph.D., Biochemistry and Molecular Biology, University of Southern California, CA, USA  
Nuclear receptor coactivator functions

Chi-Fen Lee  
Ph.D., Oncology, Molecular Biology, National Defense Medical Center, Taiwan  
Cancer immunotherapy, Molecular targeting therapy, Controlled-release drug formulation and Delivery systems of vaccine

Tzu-Yang Lin  
Ph.D. Molecular & Cellular Biology, National Tsing Hua University, Taiwan  
Drosophila neuronal connectivity and disease models

Chia-Yang Shiau  
Ph.D., University of Oxford, UK  
Hypoxia mimetic Effect against assault of ROS incurred by drug and disease pathology;  
Annexin based chimera as therapeutic and diagnostic tool;  
Non-ribosomal peptide synthetase (ACV synthetase and Gramicidin S synthetase)

Huey-Kang Sytwu  
M.D., National Defense Medical Center, Taiwan;  
Ph.D., Microbiology and Immunology, Stanford University, USA  
Immunopathogenesis of autoimmune diseases  
Immunomodulation and immunotherapy on autoimmune diabetes;  
Establishment of genetically-engineered islet grafts and lenti-siRNA-mediated knockdown mice

Chin-Chen Wu  
Ph.D., Pharmacology, University of London  
Mechanisms and possible therapies of sepsis associated with septic shock, disseminated intravascular coagulation, or multiple organ failure

Gwo-Jang Wu  
M.D., National Defense Medical Center, Taiwan;  
Ph.D., Endocrinology-Reproductive Physiology, University of Wisconsin-Madison, USA  
Cellular and Molecular Mechanisms of Fertilization  
Gametogenesis and Embryo Implantation in Mammals
Admission Requirement

The MCB program offers a wide range of topics in molecular biosciences for graduate study and research. Students with backgrounds in biochemistry, biology, molecular biology, genetics, anatomy, chemistry, physics and related fields are welcome to apply.

1. Certificate of degree
   Official records are defined as original documents issued by the institution that bear the actual signature of the Registrar and the seal of the issuing institution.

2. Transcripts
   A grade point average (GPA) of 3.0 or higher for all college work (4.0 = A) is preferred.

3. English Requirements
   Students from non-English-speaking countries are expected to read, write, comprehend, and speak English in order to be admitted for graduate study. Applicants whose first or native language is not English are required to take a test of English proficiency as part of the application procedure. One of the following language test scores must be provided for application. Please note that test scores submitted must be taken within the past two years. Applicants should ensure that the test score(s) be sent to the TIGP Admissions Office prior to the application deadline.
   Although the English proficiency requirement for admission may vary in respective programs, the recommended requirements are as follows:
   (1) TOEFL: A total score of 79 on internet-based (TOEFL-iBT), 213 on computer-based TOEFL or 550 on paper-based TOEFL is strongly recommended as the minimum admission requirement for all programs. Please note that institutional TOEFL will not be accepted; only ETS International TOEFL will be accepted.
   (2) IELTS: A minimum overall Band Score of 5.5 on the Academic Test of International English Language Testing System (IELTS) taken within the past two years is required.
   (3) GEPT: In addition to TOEFL and IELTS, applicants in Taiwan may take the General English Proficiency Test (GEPT), administered by the Language Training and Testing Center. Under this option, applicants must submit their high-intermediate level certificate with the application.

Exemption from the English proficiency requirement
The test of English proficiency can be exempted for applicants graduated from universities where English is the primary language of instruction, if the applicants provide an official certification issued by the Office.

4. The Graduate Record Examination (GRE)
   We encourage the applicants to take GRE’s General Test. Alternatively, the applicants should provide us with supplementary information (e.g. M.S. thesis, research publication, description of research experiences) that can demonstrate your potential in research. Your qualification will be reviewed by the Admissions Committee.
5. **Two Letters of Recommendation**

6. **Statement of Purpose and Study Plan (less than 3 pages)**

7. **Other Evidence of Scholarly Achievements**
   After reviewing all the supporting documents mentioned above, candidates passing the first screening will be invited for an interview. Local candidates will be asked to come to Taipei for interviews, whereas international students will be video interviewed.

Application can be submitted through the on-line application system (recommended) http://db1x.sinica.edu.tw/tigp/ or by post to:

Admissions Office  
Taiwan International Graduate Program  
No. 128, Sec.2, Academia Road,  
Nankang, Taipei 11529  
Taiwan

The submitted application materials will not be returned to applicants under any circumstances. The complete application materials should be received by TIGP before March 31.

### Requirements for Ph.D. Degree

The Ph.D. in the MCB program requires successful completion of a minimum of 30-credit courses, a qualifying exam and thesis research.

### Courses

#### 1. Required Courses

<table>
<thead>
<tr>
<th>Courses</th>
<th>Credits</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molecular and Cell Biology</td>
<td>4</td>
<td>Fall</td>
</tr>
<tr>
<td>Seminar</td>
<td>4</td>
<td>1st and 2nd year</td>
</tr>
<tr>
<td>Annual Progress Report</td>
<td>0</td>
<td>Every fall semester, for 3rd year and above students</td>
</tr>
<tr>
<td>Thesis Research</td>
<td>12</td>
<td>Graduation</td>
</tr>
</tbody>
</table>

#### 2. Elective Courses

<table>
<thead>
<tr>
<th>Courses</th>
<th>Credits</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cellular and Molecular Immunology*</td>
<td>2</td>
<td>Spring</td>
</tr>
<tr>
<td>Developmental Biology*</td>
<td>2</td>
<td>Spring</td>
</tr>
<tr>
<td>Experimental Approaches in Molecular and Cell Biology</td>
<td>2</td>
<td>Fall</td>
</tr>
<tr>
<td>Lab Rotation</td>
<td>2</td>
<td>1st year</td>
</tr>
<tr>
<td>RNA Biology*</td>
<td>2</td>
<td>Spring</td>
</tr>
<tr>
<td>To be a Scientist: Perspectives and Essential Skills</td>
<td>3</td>
<td>Spring</td>
</tr>
<tr>
<td>Topics in Plant Science*</td>
<td>2</td>
<td>Spring</td>
</tr>
<tr>
<td>Virus and Cell Interactions*</td>
<td>2</td>
<td>Fall</td>
</tr>
</tbody>
</table>

* Courses are offered every other year.

In addition, the MCB students may take any course offered by other programs in TIGP and by NDMC.

### 3. Chinese Language

In order to help TIGP students' daily lives' communication with the local people, international students are required to take one year course of Mandarin Chinese.

#### Qualifying Exam

TIGP-MCB Qualifying exam (QE) will be held in July and August every year. Students should take the QE before the start of the third academic year. Students who pass the Molecular and Cell Biology course are eligible to apply for taking QE. Student shall submit an application form and a one-page research proposal that contains Abstract and Specific Aims to the Curriculum and Degree Committee during April 15th - 30th. The topic shall not be related to your master and PhD thesis, or to your advisor's research. The topic can be in the field of student's thesis research.

The Curriculum and Degree Committee will appoint a proposal evaluation committee to evaluate each abstract and appoint QE committee for each student according to the subject of the proposal. The QE committee consists of 5 members, and the student’s thesis advisor should not serve in the committee or present during the exam.
The date of QE exam will be announced before June 1st. Student shall turn in the proposal to the MCB office two weeks before the exam date.
The format of proposal:
1. Specific Aims
2. Backgrounds and Significance
3. Experimental Design and Methods
4. Perspective Results
5. Discussion
(The item 4, 5 can be present separately or combine together.)
The format of reference should follow the journal “Cell” or “Nature”.

Students will defend their proposal in front of the QE committee. The qualifying exam will be evaluated based on (1) background knowledge, (2) rationale, originality and feasibility of the proposal, and (3) presentation skill. It requires at least four QE committee members’ approval to pass the exam. In case of failing the exam, students can retake the exam after 3-6 months.

Thesis Research

A minimum of two-year thesis research is required. Twelve credits will be granted to the student upon completion of the thesis defense.

Lab Rotation

Students may rotate through several labs with the goal of finding a lab to conduct their thesis research. The duration of each lab rotation is upon mutual agreement between the student and the advisor, but shall not exceed 4 months. A maximum of 2 credits will be granted, even if students take more than 2 lab rotations. Students are highly recommended to decide on the thesis research lab by the end of the first summer. Studentship will be terminated if a student cannot find a thesis research lab before applying for qualifying exam.

Thesis Committee

The thesis advisor will organize the thesis committee within one month after the student chooses the lab. Each committee should consist of at least 3 members, including the advisor. The thesis committee shall meet at least once a year for the progress report of the student. The committee evaluates the progress and advises on current research problems and the future direction of the project.

Progress Report

Students must give an annual progress report to the thesis committee. The first report is a thesis proposal and should be given by the end of the third semester. Thereafter, the progress report should be given once a year by the end of each fall semester. Students should prepare a written proposal or progress report according to the format given by the MCB office, and submit it to the thesis committee and MCB office 1 week before the committee meeting.

Degree Requirements

1. Completion of course requirement. 18 credits of course work is required for students with M.S. degree and 30 credits for students with B.S. degree only.
2. Publication: The student should publish, or have the manuscript accepted, at least one first-author paper on the thesis research. The affiliation of TIGP students in their published work should be listed as “Taiwan International Graduate Program, Graduate Institute of Life Science, National Defense Medical Center and Academia Sinica”, followed by the primary affiliation of the advisor.

In principle, the thesis advisor should be the only corresponding author of the publication for graduation. If more than one corresponding authors in publication, student and advisor MUST submit a written statement to specify the reason to Curriculum and Degree Committee before the beginning of the semester toward graduation for approval.
3. Written thesis in English
4. Completion annual progress reports in a timely order
5. Consent of the thesis committee to proceed with the thesis defense
6. Pass the thesis defense

Transfer Credits

New students who have previously completed graduate school coursework with a grade of 70 or higher at other domestic or international colleges and universities within five years of admission, students can request to have these credit transferred with Curriculum and Degree Committee if any of the following condition is met:

1. course with identical titles and contents (transcript required)
2. course with similar titles and contents (transcript, the course outline, syllabus and textbook used need to be provided to get approval by Curriculum and Degree Committee and the corresponding course instructor)
3. If necessary, take the oral or written exam in time.

Requests for transfer credits should be submitted by the end of the Add/Drop period of the first semester after enrolling in the program. The total numbers of transfer credits should not exceed 1/3 of the total elective credits required by the program for graduation (Thesis credits excluded). Molecular and Cell Biology, thesis research and Seminars credits cannot be transferred.

Summary of Credits

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Molecular and Cell Biology</td>
<td>4</td>
</tr>
<tr>
<td>Seminar</td>
<td>4</td>
</tr>
<tr>
<td>Elective Courses</td>
<td>≧ 10 (minimal)</td>
</tr>
<tr>
<td>Thesis Research</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
</tr>
</tbody>
</table>

Degree Conferral Policy

Based on the Regulations of the Ministry of Education in Taiwan, students will officially register with our partner universities. Upon completion of the program, each student will be conferred a Ph.D. degree by the partner university and a certificate jointly signed by the President of Academia Sinica and the Director of TIGP.
**Fellowship and Stipend**

The 1st year:
Each student will receive a monthly stipend of NT$34,000 (around USD 1,133) from TIGP.

The 2nd and 3rd years:
Student fellowships will be renewed after successful fulfillment of the fellowship requirements:
1. Satisfactory academic performance, including completion of all required courses.
2. An agreement with a MCB faculty to serve as the student’s thesis advisor.
3. Completion of the qualifying exam.

The 4th year and after:
The thesis advisor is responsible for the student fellowship. The amount of fellowship may vary depending on the advisor’s funding situation and the student’s academic performance.

**Tuition and Medical Insurance**

The structure of tuition fee is consisted of basic fee at around NTD 12,000 and credit fees according to the credits you take per semester upon registration. Each credit fee will cost approximately NTD 1,350.
The health insurance cost is approximately NTD 9,000 per year. Six months after receiving their Alien Resident Certificate, students are qualified to join the National Health Insurance Program. Students pay the same premium as all the citizens in Taiwan and enjoy the same medical coverage.

**Living and Housing Costs**

Housing options include on-campus and off-campus. On-campus self-catering student dormitory with single study bedrooms is available to TIGP students at reasonable costs (for details please visit our website at [http://tigp.sinica.edu.tw/housing.html](http://tigp.sinica.edu.tw/housing.html)). Off-campus private housing is generally more expensive with rents range from NT$ 5,000 - 15,000 per month. Program will provide assistance to students who wish to seek for off-campus housing.
Meals are available on campus at the Activity Center Cafeteria and near-by restaurants at affordable cost.

**Correspondence and Information**

For information concerning this program, please contact:
Ms. Jessica Shih and Ms. Linda Chen
Program Secretary
Institute of Molecular Biology, Academia Sinica
E-mail: jshih@imb.sinica.edu.tw; hsiao0703@imb.sinica.edu.tw
MCB Website: [http://www.imb.sinica.edu.tw/mcb](http://www.imb.sinica.edu.tw/mcb)

For information concerning TIGP, please contact:
Ms. Huan-Yi Shen
TIGP Administrative Assistant
Taiwan International Graduate Program
E-mail: tigp@gate.sinica.edu.tw
Tel: 886-2-2789-8050
Fax: 886-2-2785-8944
TIGP Website: [http://tigp.sinica.edu.tw](http://tigp.sinica.edu.tw)