

## Biodiversity Program (Biodiv)

### Introduction to the TIGP

Taiwan's Academia Sinica has established the Taiwan International Graduate Program (TIGP) in collaboration with several of the key national research universities in Taiwan. The purpose of the program is to develop the talent pool in those modern multidisciplinary fields that are important to the future economic and social development of Taiwan and to enhance standards of academic research and the potential for innovation in these and related fields.

As well as cultivating interdisciplinary research, TIGP is enhancing Taiwan's visibility in the world's academic arena. From the outset the program has not only provided rigorous interdisciplinary training, but also placed equal emphasis on the cultivation of scientific reasoning, high ethical standards, a global outlook and effective communication skills.

Under the oversight of Academia Sinica, TIGP offers an exciting intellectual environment with world-class faculty and state-of-the-art research facilities. With access to the best of the laboratory, the classroom and beyond, students will enjoy a truly rigorous interdisciplinary education.



## TIGP on Biodiversity

Over the past two centuries, global industrialization and the explosive growth of the human population have greatly accelerated the extinction of the Earth's species. This rapid decline in biodiversity is a great threat to the continuing survival of the species that remain, including humans, because it disturbs the balance of ecosystems. Biomedical and agricultural sciences also rely on natural products; successful exploitation and management of biodiversity is directly linked to human welfare. There are a great number of government agencies and non-governmental organizations devoted to raising public awareness and improving policy on biodiversity. Society has a pressing need to increase the supply of well-trained scientists in relevant fields who can work on these issues.

The TIGP Biodiversity Program, organized in conjunction with the National Taiwan Normal University (NTNU), offers a unique opportunity for aspiring young scientists to receive multidisciplinary training. The diverse ecosystems and the large number of endemic species in Taiwan are invaluable resources for the study of biodiversity. In addition, the strong research teams in Academia Sinica and NTNU provide students with a broad range of expertise in areas such as ecology, evolution, genetics, statistics and socio-economics. We expect our graduates to contribute to basic research that improves our understanding of biodiversity in Taiwan and the surrounding areas and, ultimately, to influence public policies for the conservation and sustainability of biological resources.



## Faculty Members

### Academia Sinica Biodiversity Research Center

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#### Dr. Wen-Hsiung Li, Distinguished Research Fellow and Director

*Ph.D., Brown University, USA*  
Evolutionary genomics, molecular  
evolution, bioinformatics and  
computational biology

#### Dr. Shu-Miaw Chaw, Distinguished Research Fellow

*Ph.D., Tulane University, USA*  
Evolution, phylogenetics and functional  
genomics of seed plants

#### Dr. Chih-Yu Chiu, Research Fellow

*Ph.D., National Tsukuba University,  
Japan*  
Soil biochemistry and microbiology,  
biogeochemistry

#### Dr. Allen Chen, Research Fellow

*Ph.D., James Cook University, Australia*  
Evolutionary ecology and genetics of coral  
reefs, coral phylogeny and speciation

#### Dr. Benny K.K. Chan, Research Fellow

*Ph.D., The University of Hong Kong*  
Intertidal and supply-side ecology,  
barnacle ecology, larval ecology

#### Dr. Sen-Lin Tang, Research Fellow

*Ph.D., University of Melbourne,  
Australia*  
Virology, archaeal biology, microbial  
genomics and computational biology

#### Dr. Daryi Wang, Associate Research Fellow

*Ph.D., National Taiwan Ocean  
University, Taiwan*  
Metagenomics, evolutionary genomics

#### Dr. Sheng-Feng Shen, Associate Research Fellow

*Ph.D., Cornell University, USA*  
Behavioral ecology, sociobiology,  
evolutionary game theory, climate change  
ecology

#### Dr. Kuo-Fang Chung, Associate Research Fellow

*Ph.D., Washington University in St.  
Louis, USA*  
Plant Taxonomy, Evolution, Population  
Genetics, Biogeography

#### Dr. Yoko Nozawa, Associate Research Fellow

*Ph.D., Kyushu University, Japan*  
Reproductive and recruitment ecology of  
reef corals, population and community  
ecology of reef corals

#### Dr. John Wang, Assistant Research Fellow

*Ph.D., Stanford University, USA*  
Social insect behavior, evolution, genetics  
and genomics, nematode genome  
evolution

#### Dr. Ryuji Machida, Assistant Research Fellow

*Ph.D., University of Tokyo, Japan*  
Marine ecology, phylogeography, genetic  
connectivity of marine metazoans

#### Dr. Yin-Ru Chiang, Assistant Research Fellow

*Ph.D., University of Freiburg, Germany*  
Physiology and metabolism of bacteria,  
biodegradation and bioremediation, and  
microbial metabolomics

#### Dr. Isheng Jason Tsai, Assistant Research Fellow

*Ph.D., Imperial College, UK*  
Evolution of parasitism and pathogenicity.  
Eukaryotic microbes (fungi and helminths)  
ecology and biodiversity

#### Dr. Mao-Ning Tuanmu, Assistant Research Fellow

*Ph.D., Michigan State University, USA*  
Biogeography, biodiversity conservation,  
remote sensing

#### Dr. Chih-Ming Hung, Assistant Research Fellow

*Ph.D., University of Minnesota, USA*  
Evolution, Population genetics, genomics,  
phylogeography

### Agricultural Biotechnology Research Center

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#### Dr. Lie-Fen Shyur, Research Fellow

*Ph.D., National Taiwan University,  
Taiwan*  
Herbal medicine research, enzyme  
biotechnology

#### Dr. Wen-Chin Yang, Associate Research Fellow

*Ph.D., Université de la Méditerranée,  
France*  
Herbal medicine research, molecular  
vaccine technology

### Genomics Research Center

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#### Dr. Trees-Juen Chuang, Research Fellow

*Ph.D., National Chiao Tung University,  
Taiwan*  
Bioinformatics and computational biology,  
comparative & evolutionary genomics/  
transcriptomics, post-transcriptional  
regulation, genome annotation, DNA  
methylation, systems biology

#### Dr. Tsung-Lin Li, Associate Research Fellow

*Ph.D., University of Cambridge, UK*  
Natural product chemistry, microbial  
pathogenicity

## Institute of Cellular and Organismic Biology

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### Dr. Jr-Kai Yu, Associate Research Fellow

*Ph.D., University of California, San Diego, USA*

Developmental biology, evolution of development

### Dr. Yi-Hsien Su, Associate Research Fellow

*Ph.D., University of California, San Diego, USA*

Developmental biology, gene regulatory networks, systems biology

### Dr. Kinya G. Ota, Assistant Research Fellow

*Ph.D., The Graduate University for Advanced Studies (SOKENDAI), Japan*

Evolutionary developmental biology, marine biology

### Dr. Yung-Che Tseng, Assistant Research Fellow

*Ph.D., National Taiwan University, Taiwan*

Marine ecophysiology, molecular physiology, systems biology, evolutionary and comparative physiology

## Institute of Chemistry

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### Dr. Steve S.-F. Yu, Associate Research Fellow

*Ph.D., National Tsing Hua University, Taiwan*

Bioorganic chemistry and bioinorganic chemistry

## Institute of Information Science

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### Dr. Arthur Chun-Chieh Shih, Research Fellow

*Ph.D., National Central University, Taiwan*

Next-generation sequencing, microrna regulation, molecular evolution, short read sequence assembly

## Institute of Plant and Microbial Biology

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### Dr. Chih-Horng Kuo, Associate Research Fellow

*Ph.D., University of Georgia, USA*

Microbial genome evolution and diversity

## Institute of Statistical Science

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### Dr. Wei-Chung Liu, Assistant Research Fellow

*Ph.D., Imperial College London, UK*

Mathematical biology, theoretical ecology, quantitative epidemiology, network biology, sociology, systems biology

## Institute of Molecular Biology

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### Dr. Jun-Yi Leu, Research Fellow

*Ph.D., Yale University, USA*

Molecular mechanisms of speciation and genetic buffering

## Research Center for Environmental Changes

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### Dr. Tung-Yuan Ho, Associate Research Fellow

*Ph.D., State University of New York at Stony Brook, USA*

Marine biogeochemistry, marine organic chemistry, environmental analytical chemistry

## National Taiwan Normal University Department of Life Science

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### Dr. Yuying Hsu, Professor

*Ph.D., Syracuse University, USA*

Animal behavior (contest decisions, learning, physiological mechanisms)

### Dr. Jenn-Che Wang, Professor

*Ph.D., National Taiwan University, Taiwan*

Taxonomy of plants, Plant ecology

### Dr. Yu-Feng Hsu, Professor

*Ph.D., University of California, Berkeley, USA*

Entomology, invertebrate zoology

### Dr. Shih-Ying Hwang, Professor

*Ph.D., Ohio State University, USA*

Genetics, phylogenetics

### Dr. Chung-Chi Chen, Professor

*Ph.D., University of Maryland, USA*

Ecological modeling, system ecology, planktonic ecology, estuarine ecology, nutrient dynamics, experimental ecosystems

### Dr. Teng-Chiu Lin, Professor

*Ph.D., The University of Kansas, USA*

Forest ecology, landscape ecology

**Dr. Shou-Hsien Li, Professor**

*Ph.D., State University New York, Albany, USA*

Population genetics and evolution, topics in animal behavior

**Dr. Li-Yih Lin, Professor**

*Ph.D., National Defense Medical Center, Taiwan*

Fish Physiology, Cell Physiology

**Dr. Chung-Ping Lin, Professor**

*Ph.D., Cornell University, USA*

Molecular systematics, character evolution, phylogeography, speciation mechanisms, insect endosymbiosis

**Dr. Si-Min Lin, Associate Professor**

*Ph.D., National Taiwan Normal University, Taiwan*

**Molecular evolution and phylogeography**

**Dr. Pei-Chun Liao, Associate Professor**

*Ph.D., National Taiwan Normal University, Taiwan*

Population genetics, molecular evolution, phylogeography, molecular ecology

**Dr. Tsu-Wei Wang, Associate Professor**

*Ph.D., University of Michigan, USA*

Neuroscience, developmental neurobiology, neural stem cell

**Dr. Pei-Jen Lee Shaner, Associate Professor**

*Ph.D., University of Virginia, USA*

Small mammal population dynamics, foraging behavior, wildlife habitat use, mark-recapture (mark), stable isotope ecology, biostatistics, database and GIS

**Dr. Chi-Chien Kuo, Assistant Professor**

*Ph.D., University of California, Davis, USA*

Disease ecology, ecological immunology, ecological parasitology, mammalogy



## Focal Areas

- Evolution and Genetic Diversity
- Species Diversity
- Ecosystem Diversity and Environmental Change

## Highlights of Curriculum Philosophy

- The program offers students the flexibility of designing a tailored training experience; elective courses have a modular design and the number of required courses is minimized.
- All courses are offered in English.

## Course Offerings

### A. Required courses

1. Population Genetics and Evolution (3 credit units)
2. Ecology and Conservation (3 credit units)
3. Seminar (1 credit unit, 4 semesters)
4. Lab Rotation (1 credit unit, 2 semesters, 2-4 laboratories)

### B. Elective courses (select at least two)

1. Molecular Evolution (3 credit units)
2. Ecological and Evolutionary Genomics (3 credit units)
3. Introduction to Next-Generation Sequencing (NGS) Data and Analysis (3 credit units)
4. Behavioral Ecology (3 credit units)
5. Biodiversity (3 credit units)
6. Systematics (3 credit units)
7. Marine Ecosystems (3 credit units)
8. Conservation Biology (3 credit units)
9. Disease Ecology (3 credit units)
10. Biological Modeling (3 credit units)
11. Biogeography (3 credit units)
12. Biostatistics (3 credit units)
13. Advanced Seminar (1 credit unit)
14. Microbial Ecology and Diversity (3 credit units)
15. Writing and Presentation of Biological (3 credit units)



### C. Chinese Language

International students are required to take a one year course in Mandarin Chinese in order to help their daily communication with local people.

## Degree Requirements

### 1. Course Work

- Each student is required to complete 12 credit units of required course work.
- Students with a Master's degree or who have worked in a related research field for at least five years after obtaining a B.S. degree require 6 further credit units (18 credits in total). Students with only a B.S. degree require 18 further credit units (30 credits in total). (NTNU reserves the right to make the final decision on the student's qualification.)

### 2. Lab Rotation

A student should rotate through 2 to 4 labs in 2 semesters. A failed rotation should be retaken the following semester.

### 3. Thesis Advisor

A student is required to identify a Thesis Advisor from within the Program faculty one month before the end of the first year (no later than June 30).

### 4. Thesis Advisory Committee

Within a month of identifying a Thesis Advisor, a student should propose, with Advisor's help, a Thesis Advisory Committee, to be approved by the Curriculum Committee. The committee should consist of at least five members, including the Thesis Advisor, and at least one committee member not affiliated with Academia Sinica or National Taiwan Normal University. The Thesis Advisory Committee shall meet at least once every six months to receive a progress report from the student. The Committee shall evaluate progress, and advise on current research problems and the future direction of the project.

### 5. Qualification Examination

The Qualification examination consists of two stages, the Preliminary Examination and the Thesis Proposal Oral Defense, explained briefly below. For details of the Qualification Examination, see "Guidelines for Qualifying Examinations in the TIGP Biodiversity Program, Biodiversity Research Center, Academia Sinica and Department of Life Science, National Taiwan Normal University" (<http://biodiv.tw/TIGP-BP/index.php?page=download>).

#### 5.1 Preliminary Examination

A student must demonstrate the depth and breadth of his/her knowledge in the fields of biodiversity by passing an oral examination. The student should take the Preliminary Examination before the end of the second semester; if the student does not pass the Preliminary Examination, the student's monthly fellowship will suffer a 10,000 reduction until the student passes the examination.

Only one make-up examination will be allowed if a student fails at the first attempt, and the student must pass the make-up examination before the end of the third semester.

### 5.2 Thesis Proposal and Oral Defense:

A student must demonstrate the suitability of his/her proposed research by successfully defending his/her thesis proposal. The student should complete the Thesis Proposal Oral Defense before the end of the fourth semester and provide the Program Office with a near-final copy of the full thesis proposal to be defended two weeks before the defense date. If the student does not pass the Thesis Proposal Oral Defense, the student's monthly fellowship will suffer a 10,000 reduction until the student passes the defense.

Only one make-up oral defense will be allowed if a student fails at the first attempt. The student must pass the make-up oral defense before the end of the fifth semester.

### 6. Progress Report

A student who has passed the Thesis Proposal Oral Defense should call a progress report meeting at least once before the end of each academic year until graduation; the Thesis Advisory Committee shall evaluate progress, and advise on current research problems and the future direction of the student's project.

### 7. Thesis Defense

Before applying to defend his or her thesis, a TIGP-BIODIV student must have research results published or manuscripts accepted by SCI journals. The student must be the first author or corresponding author of either (1) one paper with an Impact Factor higher than 5 or in a journal ranked in the top 10% in the field or (2) more than one paper where the sum of the papers' impact factors is greater than 5. Students should show either the letter(s) of acceptance or the published paper(s).

## 8. TIGP-BIODIV Program Study Schedule

Year		Time to Complete	Task/Exam
1st	Fall	October 15	Complete NTNU on-line Research Ethic Course (new for enrolled students in and after 2016.09)
	Spring	June 30	Submit the "Thesis Advisor Record" form
		January 31	1.Submit the "Thesis Advisory Committee" form 2.Take the "Preliminary Examination"
2nd	Fall	January 31	Pass the "make-up Preliminary Examination"
	Spring	July 31	Take the "Thesis Proposal Oral Defense"
3rd	Fall	January 31	Pass the "make-up Thesis Proposal Oral Defense"
3rd and beyond		July 31, once every academic year	Call yearly progress report meetings
Degree Examination		Apply before November 15/ May 15	Pass "Degree Examination" before the end of the 7th year (14th semester)
For students enrolled in and after 2017.09			

## Student Status and Degree Conferral Policy

Degree candidates in the Biodiversity Program must be officially registered students of the TIGP Biodiversity Program of the National Taiwan Normal University. Upon graduation, a student will be conferred a Ph.D. degree, and will receive a diploma from the National Taiwan Normal University as well as a certificate from Academia Sinica.



## Admission to the Ph.D. Program

The Program strongly suggests that applicants, while applying, contact members of the program faculty whose research interests might match their thesis topics and who might act as the students' thesis advisors. Interaction between applicants and faculty members will help the Program understand more about the applicant and improve the process of reviewing applications.

The Program admits students to the fall semester only. Application information is available at and applications can be submitted through the TIGP web site: <http://tigp.sinica.edu.tw>. The deadline for application is March 31. It is to the advantage of the students to apply as early as possible. There is no charge for applications.

Students with a B.S. or M.S. degree from an accredited institution will be considered for admission. The following criteria/materials will be used to evaluate the applicant's qualifications for admission:

1. Undergraduate and graduate academic records or transcripts.
2. The General Test of the Graduate Record Examination (GRE): General and Subject scores are optional but applicants are strongly encouraged to provide them. Applicants who fail to submit GRE scores for evaluation, should provide supplementary information (e.g. M.S. thesis, research publication, description of research experience, etc) to demonstrate their research potential.
3. English proficiency: Applicants whose first language is not English must submit the results of an English test taken within the two years preceding the application deadline. Acceptable test scores are
  - i. TOEFL: scores of 550 on the paper-based (or 79 on the new internet-based TOEFL (TOEFL-iBT)) or higher; (Our institution CODE & NAME are: 7142 Academia Sinica) Only ETS International TOEFL will be accepted. Institutional TOEFL will not be accepted.

- ii. GEPT: Instead of TOEFL, applicants in Taiwan may take the General English Proficiency Test (GEPT) administered by the Language Training and Testing Center. Applicants are required to submit their high-intermediate level certificate when applying for admissions.
- iii. IELTS (International English Language Test System): Scores of 5.5 or higher on the Academic Test are required. Applicants who have recently completed two or more years of study in an English-speaking country are exempt from this requirement.
- 4. Three letters of recommendation commenting on the applicant's personal character and qualifications for independent study, including intellectual ability, research potential and scientific motivation.
- 5. Statement of purpose (plan, including research interests and reason for graduate study).
- 6. A student with only a B.S. degree and less than five years' relevant post-graduate work experience prior to the date of application will enroll the program first as an M.S. student in the Department of Life Science of NTNU. These students must subsequently submit an application for "Direct Admission into the Doctoral Program" to complete their entrance to the TIGP Biodiversity PhD Program and must obtain a minimum of 30 credits for graduation. Students with an M.S. degree or who have worked in a related research field for at least five years after obtaining a B.S. degree need a minimum of 18 credits for graduation. (NTNU reserves the right to make the final decision on the student's qualification.)

For online application to the TIGP, please proceed to <http://db1x.sinica.edu.tw/tigp/>. The application materials submitted for evaluation will not be returned to the applicants under any circumstances.

Please send hardcopy applications to:  
Admissions Office  
Taiwan International Graduate Program  
128 Academia Road, Section 2  
Nankang, Taipei 11529  
Taiwan

## Fellowship Support and Stipends

The TIGP provides a full fellowship at NT\$34,000 (approximately US\$1,060) per month for each graduate student for the first year. The support will be renewable for another two years upon evidence of satisfactory progress towards the degree. If the progress falls short in some way the amount of support may be reduced. Starting from the 4th year, financial support will depend on the laboratory you have joined, which will also determine the amount and the length of the support. For more details, see <http://biodiv.tw/TIGP-BP/index.php?page=download>



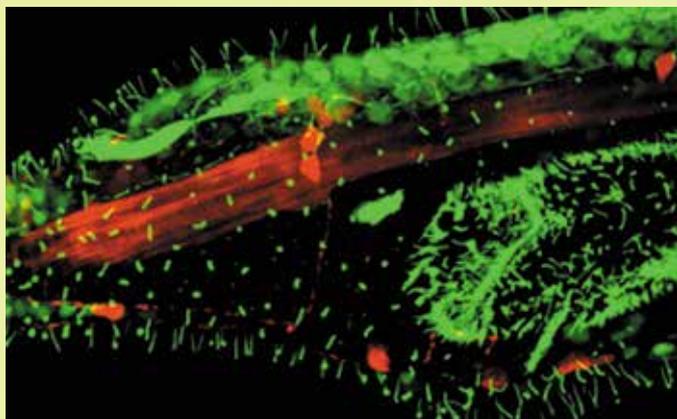
## Tuition, Housing, Medical Insurance and Living Cost

The NTNU tuition fees for international students are reduced so that they pay the same amount as local students. Options for housing include on-campus and off-campus accommodation. A self-catering student dormitory providing single study bedrooms is available to TIGP students at reasonable cost on the Academia Sinica campus. (For details please visit the website: <http://tigp.sinica.edu.tw/Accommodation.html>).

### A summary of the expected cost of attendance:

Item	NTD	
Registration Fee	12,390/semester	
Credits Fee	1,470/credit	
National Health Insurance*	7,500-8,000/	
	On-campus (Single Room)	Off-campus (Single Room/Apartment)
Housing	5,500 /month	6,000-20,000 /month
Living Expenses	6,000-8,000/month	

\*Students are qualified to join the "Taiwan National Health Insurance Program" six months after obtaining an Alien Resident Card (ARC) in Taiwan provided that they have resided continuously in Taiwan during that time. Students have to pay a premium for the insurance program and will be entitled to the same medical coverage as Taiwanese citizens.



## Contact Information

For information concerning the Biodiversity Program, please contact:

### Dr. Seng-Feng Shen

Program Coordinator  
Biodiversity Research Center  
Program Homepage  
<http://biodiv.sinica.edu.tw/TIGP-BP>

### Ms. Vanessa Chen

Program Assistant  
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For information concerning TIGP, please contact:

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Taiwan International Graduate Program  
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Taiwan International Graduate Program (TIGP) Homepage:  
<http://tigp.sinica.edu.tw>

