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 extinction of the Earth’s species. This rapid decline in biological diversity 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 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 National Taiwan Normal University (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 biological diversity in Taiwan and the surrounding areas, and ultimately, to influence public policies for the conservation and sustainability of biological resources.
Faculty

Academia Sinica

Biodiversity Research Center

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. Allen Chen, Research Fellow
Ph.D., James Cook University, Australia
Evolutionary ecology and genetics of coral reefs, coral phylogeny and speciation

Dr. Daryi Wang, Associate Research Fellow
Ph.D., National Taiwan Ocean University, Taiwan
Metagenomics, evolutionary genomics

Dr. Sen-Lin Tang, Associate Research Fellow
Ph.D., University of South Florida, USA
Environment and ecology, conservation

Dr. Hwey-Lian Hsieh, Research Fellow
Ph.D., University of South Dakota, USA
Virology, archaeal biology, microbial genomics, and computational biology

Dr. Benny K.K. Chan, Associate Research Fellow
Ph.D., The University of Hong Kong
Intertidal and supply-side ecology, barnacle ecology, larval ecology

Dr. Sheng-Feng Shen, Assistant Research Fellow
Ph.D., Cornell University, USA
Behavioral ecology, sociobiology, evolutionary game theory, climate change ecology

Dr. Yoko Nozawa, Assistant 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

Agricultural Biotechnology Research Center

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

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

Dr. Jr-Kai Yu, Assistant Research Fellow
Ph.D., University of California, San Diego, USA
Developmental biology, evolution of development

Dr. Yi-Hsien Su, Assistant 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

Institute of Chemistry

Dr. Steve S.-F. Yu, Associate Research Fellow
Ph.D., National Tsing Hua University, Taiwan
Bioorganic chemistry and bioinorganic chemistry

Dr. Ming-Hsi Chiang, Associate Research Fellow
Ph.D., Indiana University at Bloomington, USA
Bioinorganic chemistry and catalysis

Institute of Information Science

Dr. Wen-Liang Hwang, Research Fellow
Ph.D., New York University, USA
Wavelet analysis, signal, image and video processing

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

Dr. Chih-Hong Kuo, Associate Research Fellow
Ph.D., University of Georgia, USA
Microbial genome evolution and diversity

Institute of Statistical Science

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 Earth Sciences

Dr. Der-Chuen Lee, Associate Research Fellow
Ph.D., University of Michigan, USA
Isotope geochemistry
Institute of Molecular Biology
Dr. Jun-Yi Leu, Research Fellow
Ph.D., Yale University, USA
Molecular mechanisms of speciation and genetic buffering

Research Center for Environmental Changes
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
Dr. Yuying Hsu, Professor
Ph.D., Syracuse University, USA
Animal behavior (contest decisions, learning, physiological mechanisms)

Dr. Shou-Hsien Li, Professor
Ph.D., State University New York, Albany, USA
Population genetics and evolution, topics in animal behavior

Dr. Chung-Chi Chen, Professor
Ph.D., University of Maryland, USA
Ecological modeling, system ecology, planktonic ecology, estuarine ecology, nutrient dynamics, experimental ecosystems

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-Ping Lin, Professor
Ph.D., Cornell University, USA
Molecular systematics, character evolution, phylogeography, speciation mechanisms, insect endosymbiosis

Dr. Teng-Chiu Lin, Professor
Ph.D., The University of Kansas, USA
Forest ecology, landscape ecology

Dr. Jenn-Che Wang, Professor
Ph.D., National Taiwan University, Taiwan
Taxonomy of plants, plant ecology

Dr. Guan-Chiu Lee, Associate Professor
Ph.D., National Yang-Ming University, Taiwan
Biochemistry, molecular biology, protein engineering

Dr. Pei-Chun Liao, Associate Professor
Ph.D., National Taiwan Normal University, Taiwan
Population genetics, molecular evolution, molecular ecology, phylogeography

Dr. Si-Min Lin, Associate Professor
Ph.D., National Taiwan Normal University, Taiwan
Molecular evolution and phylogeography

Dr. Tsu-Wei Wang, Associate Professor
Ph.D., University of Michigan, USA
Neuroscience, developmental neurobiology, neural stem cell

Dr. Chi-Chien Kuo, Assistant Professor
Ph.D., University of California, Davis, USA
Disease ecology, ecological immunology, ecological parasitology, mammalogy

Dr. Pei-Jen Lee Shaner, Assistant 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. Yung-Che Tseng, Assistant Professor
Ph.D., National Taiwan University, Taiwan
Marine ecophysiology, molecular physiology, systemics, evolutionary and comparative physiology

Focal Areas
- Evolution and Genetic Diversity
- Species Diversity
- Ecosystem Diversity
- Environmental Change and Biodiversity

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 laboratories)

B. Core Elective courses (select at least two)
1. Molecular Evolution (3 credit units)
2. Evolutionary Biology (3 credit units)
3. Systematics (3 credit units)
4. Ecological and Evolutionary Genomics (3 credit units)
5. Biodiversity (3 credit units)
6. Biostatistics (3 credit units)
7. Behavioral Ecology (3 credit units)
8. Conservation Biology (2 credit units)
9. Population Ecology (3 credit units)

C. Elective courses
1. Special Topics on Bioinformatics (3 credit units)
2. Biomathematics (3 credit units)
3. Writing and Presentation of Biological Research (2 credit units)
4. The Regulation and Evolution of Gene Expression (2 credit units)
5. Molecular and Cell Biology (4 credit units)  
6. Adaptation and Selection (2 credit units)  
7. Marine Ecosystems (3 credit units)  
8. Environmental Change and Marine Biodiversity (3 credit units)  
9. Biological Modeling (3 credit units)  
10. Advanced Seminar (1 credit unit)  

D. **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), including 2 core elective courses, are required. Students with a only B.S. degree require 18 further credit units (30 credits in total), including 2 core elective courses. (NTNU reserves the right to make the final decision on the student's qualification.)

#### 2. Lab Rotation
A student should rotate through 2 labs in 2 semesters. The duration of each lab rotation is 16 weeks. A failed rotation should be retaken in the following semester.

#### 3. Thesis Advisor
A student is required to identify a Thesis Advisor from within the Program faculty before the start of the second year.

#### 4. Thesis Advisory Committee
Within one month of identifying a Thesis Advisor, a student shall propose, with the help of the Thesis Advisor, the composition of the Thesis Advisory Committee, which shall then be submitted to the Curriculum Committee for further approval. The Thesis Advisory Committee shall consist of at least five members (including the Thesis Advisor and at least one committee member who is not affiliated with Academia Sinica or NTNU). The Committee evaluates the progress and advises on current research problems and the future direction of the student's project.

#### 5. Qualification Examination

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#### 5.1 Pre-proposal
A student is required to submit a pre-proposal to the Curriculum Committee before the end of the third semester. The Pre-proposal shall include: (1) a tentative title, (2) a brief description of background and motivation and (3) tentative specific aims. The pre-proposal shall be at least two A4 pages.

#### 5.2 Preliminary Examination
Between the end of the second semester and the end of the fourth semester, a student must demonstrate his/her knowledge of biodiversity fundamentals and a potential for research by passing an oral examination. The format and the rules of the examination will be determined by the Academic Affairs Committee.

#### 5.3 Preliminary Proposal
A student is required to submit a Preliminary Proposal to the Curriculum Committee before the end of the fourth semester. The Preliminary Proposal shall include (1) a tentative title, (2) background and motivations, (3) tentative specific aims, (4) significance and (5) approach and methods.

#### 5.4 Thesis Proposal and Oral Defense
A student shall provide the Program Office with a near-final copy of the full thesis proposal to be defended and take oral defense before the end of the sixth semester.

The Thesis Proposal Examination Committee shall include at least five experts in fields relevant to the thesis research, including at least one committee member not affiliated with Academia Sinica or National Taiwan Normal University. The Thesis Proposal Examination Committee must be approved by the Curriculum Committee.

#### 6. Progress Report
After passing the full thesis proposal and oral defense, a student must submit a progress report to the Thesis Advisory Committee by the end of each academic year (July 31st). The progress report should be written according to the format given by the Program Office and should be submitted to the Thesis Advisory Committee and the Program Office one week prior to the committee meeting.

#### 7. Thesis Defense
Prior to application for thesis defense, a TIGP-BIODIV student should have research result(s) published or manuscript(s) accepted by a SCI journal. A student should meet at least one of the following conditions: the first author or the corresponding author of one paper with Impact Factor higher than 5 or in a journal ranked at the top 10% in the field, or more than one paper with the sum of Impact Factors greater than 5.

### 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 the Academia Sinica.
Admission to the Ph.D. Program

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

TIGP-Biodiversity Program offers admissions for the fall semester only. For more information regarding admission to the Ph.D. program, please visit TIGP website at http://tigp.sinica.edu.tw; for online application, please proceed to http://db1x.sinica.edu.tw/tigp/. The deadline for application is March 31 every year. 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 it. 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) that can demonstrate their research potential.

3. English proficiency: All applicants whose first language is not English must submit an English test score, except those applicants who have recently completed two or more years of study in an English-speaking country. Please note that test scores submitted must be from tests taken within the two years prior to the application deadline.
   i. TOEFL: scores of 550 on the paper-based (or 213 on the computer-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.

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 Department of Life Science of NTNU. These students must subsequently submit an application of “Direct Admission into 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 (NTNU reserves the right to make the final decision on the student's qualification) need a minimum of 18 credits for graduation.

Application can be submitted through the on-line application system (recommended) http://db1x.sinica.edu.tw/tigp/index.php 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.

Fellowship Support and Stipends

The TIGP will provide a full fellowship for all incoming graduate students during the first year of their enrollment at NT$34,000 (approximately US$1,133) per month. This support will be extended for another two years on evidence of satisfactory progress towards the degree. In subsequent years, students’ financial support will be provided by their Thesis Advisors. The amount of the support will be at the discretion of the Thesis Advisor.
Housing and Living Costs

Options include on-campus housing and off-campus housing. A self-catering student dormitory providing single study bedrooms is available to TIGP students at reasonable cost on the Academica Sinica campus. (for details please visit our website at http://tigp.sinica.edu.tw/housing.html). Off-campus private housing is generally more expensive. Rents for off-campus apartments with 2-3 rooms range from NT$12,000-20,000 (US$400-670) per month not including utilities.

Meals are available at modest cost at several eateries on the Academia Sinica campus. Various types of local cuisine are also available at off-campus cafeterias and restaurants within walking distance and at affordable costs.

The Gymnasium on campus, which is equipped with indoor jogging track, gym, swimming pool, aerobic court, and so on, is also available to students at modest cost.

Medical Insurance

A student will qualify for Taiwan’s National Health Insurance Program six months after he/she receives an Alien Resident Certificate (ARC), which will be available soon after arrival in Taiwan. Students are expected to pay the same premium as all Taiwan citizens (about NT$660/US$22 per month) and will be entitled to the same medical coverage.

Contact Information

For information concerning the Biodiversity Program, please contact:
Program Coordinator
Dr. Wen-Hsiung Li
Biodiversity Research Center

Program Homepage
http://biodiv.sinica.edu.tw/TIGP-BP

Program Assistant
Mr. Sage Kung
Tel: 886-2-2787-2234
Fax: 886-2-2789-9624
E-mail: tigpbiodiv@gate.sinica.edu.tw

For information concerning TIGP, please contact:
Ms. Huan-Yi Shen
TIGP Administrative Assistant
Taiwan International Graduate Program
Nankang, Taipei 115, Taiwan
E-mail: tigp@gate.sinica.edu.tw
Tel: 886-2-2789-8050
Fax: 886-2-2785-8944
Taiwan International Graduate Program (TIGP) Homepage:
http://tigp.sinica.edu.tw