

IPMB NEWSLETTER

Institute of Plant and Microbial Biology, Academia Sinica

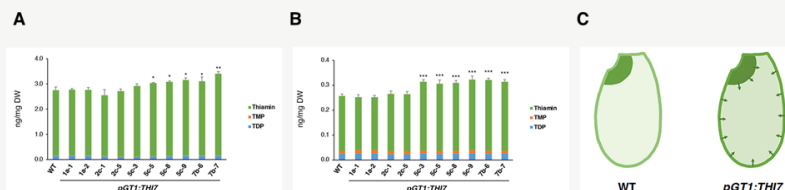


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Research Highlights 本期研究亮點

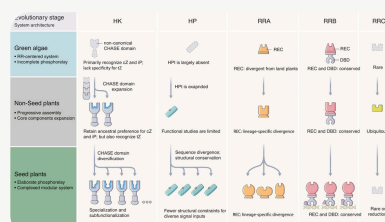
1 [Ming-Hsiun Hsieh] Endosperm-specific expression of a yeast thiamin transporter enhances vitamin B1 content in white rice



White rice contains very low levels of vitamin B1, placing populations that rely on it as a staple food at risk of vitamin B1 deficiency. To address this problem, Dr. Ming-Hsiun Hsieh's research team at our institute developed transgenic rice expressing the yeast vitamin B1 transporter gene *THI7* specifically in the endosperm under the control of the rice *GTT1* promoter. This increased the vitamin B1 content of rice grains by approximately 25% without affecting plant growth or grain yield under field conditions. The study provides a promising strategy for biofortifying white rice to help alleviate global vitamin B1 deficiency.

Chen et al., *J Exp Bot.* 2026 Jul 29;77(14):4449–4458.
<https://doi.org/10.1093/jxb/erag148>

2 [Ting-Ying Wu] Modular cytokinin evolution: Integrating heat stress and development during terrestrialization



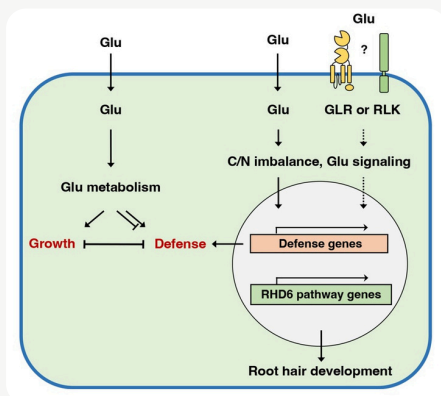
Cytokinin signaling, long regarded primarily as a developmental regulator, has emerged as a central integrator of plant terrestrial adaptation.

Comparative genomic and structural phylogenetics indicate a stepwise assembly of the phosphorelay, where

receptor domains diversified alongside lineage-specific shifts in cytokinin usage, from cis-zeatin-enriched systems in early-diverging lineages toward trans-zeatin-dominant signaling in vascular plants, while downstream executors remained evolutionarily constrained. Cross-lineage transcriptomic comparisons under heat stress suggest a rewiring of physiological outputs. Although growth repression is deeply conserved, broader metabolic responses differ across clades: trehalose-associated osmoprotection in early land plants, whereas angiosperms transitioned to redox- and transport-based strategies. Overall, cytokinin signaling forms a modular framework that enabled early environmental buffering and was subsequently refined to support the complex architectures of vascular plants.

Wang et al., *Trends Plant Sci.* 2026 Jun 11:S1360–1385(26)00168–8.
<https://doi.org/10.1016/j.tplants.2026.05.007>

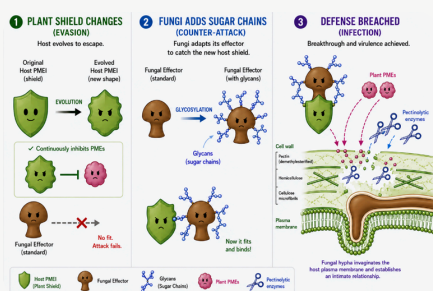
3 [Ming-Hsiun Hsieh] Glutamate triggers defense responses and promotes root hair elongation in *Arabidopsis*



Recent research from Dr. Ming-Hsiun Hsieh's laboratory has revealed that exogenous glutamate (Glu) serves dual functions as both a nitrogen source and a danger signal, and can influence plant growth, immune responses, and root hair development in *Arabidopsis* through distinct hormonal and transcriptional regulatory pathways.

Hung et al., *Plant Physiol.* 2026 Jul 2;201(3):kiag484.
<https://doi.org/10.1093/plphys/kiag484>

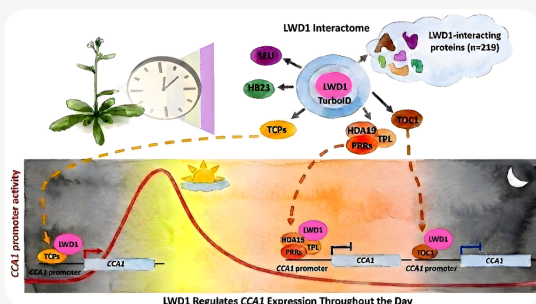
4 [Lay-Sun Ma] How a Corn Smut Fungus Hacks Plant Cell Walls



Plants reinforce their cell walls with pectin, using PMEIs as molecular brakes to maintain this barrier against pathogens. The UMaydis@IPMB group discovered that the corn smut fungus *Ustilago maydis* bypasses this defense by secreting Ngel, which disables plant PMEIs. Without these brakes, the plant's own enzymes break down pectin, loosening the cell wall and promoting fungal colonization. Crucially, N-glycosylation adds specific sugar chains to Ngel, enabling it to specifically recognize host PMEIs. Adding these sugar tags to a non-functional ortholog restores the virulence of the ΔNgel mutant, revealing how fungi use glycan modifications to outsmart plant defenses.

Bhaskar et al., *Plant Cell.* 2026 Aug 10;koag234.
<https://doi.org/10.1093/plcell/koag234>

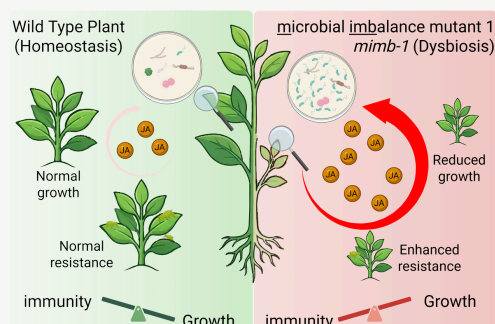
5 [Shu-Hsing Wu] Plant circadian clock: LWD protein complexes keep the 24-hour timeline in check



External light entrains plant circadian rhythms, while internal clocks help plants anticipate daily light-dark cycles. Dr. Shu-Hsing Wu's team previously showed that LWD proteins are essential for a robust *Arabidopsis* circadian clock. Using TurboID proximity labeling, the team identified 219 LWD1-interacting proteins, revealing that LWD1 dynamically recruits different partners throughout the day. At dawn, LWD1 interacts with TCPs to activate the morning gene *CCA1*. From late afternoon through early night, it forms a repression complex with PRRs/HDA/TPL to suppress *CCA1*. This dual regulatory mechanism ensures that *CCA1* peaks at dawn, helping synchronize the plant's 24-hour internal clock with external light cues.

Huang et al., *Proc Natl Acad Sci USA.* 2026 Aug 11;123(32):e2618203123.
<https://doi.org/10.1073/pnas.2618203123>

6 [Ka-Wai Ma] How a Scented Hormone Shapes the Plant Microbiome



Plants rely on a balanced microbiota for healthy growth and stress tolerance. Using Arabidopsis, researchers found a mutant with elevated jasmonic acid (JA) signaling associated with altered microbial profiles, increased microbial load, and microbiota-dependent growth defects. JA treatment reproduced similar effects in wild-type plants, suggesting regulation through a positive feedback loop. Although enhanced JA signaling impaired plant growth, it also enhanced pathogen resistance. These findings revealed that JA plays a key role in shaping plant-microbiota interactions and highlight the importance of tightly regulating JA signaling to balance growth, defense, and interaction with the plant microbiome.

Lu and Isip et al., *ISME J.* 2026 Jan 14;20(1):wrag146.
<https://doi.org/10.1093/ismejo/wrag146>



Resources to Share 實用資訊分享

RECOMMENDED BY THE LIFE SCIENCE LIBRARY

Teaching Tools in Plant Biology



Teaching Tools in Plant Biology, developed by the **American Society of Plant Biologists (ASPB)**, provides peer-reviewed, research-based educational resources that help instructors incorporate current plant science into their teaching. Each topic includes a concise overview article, ready-to-use PowerPoint slides, and suggested readings that can be used independently or integrated into lesson plans.

Users can:

Discover peer-reviewed teaching resources covering diverse plant biology topics

Download classroom-ready PowerPoint slides

Explore curated reading materials for further learning

Enhance teaching with research-based educational content

RELATED LINKS

Teaching Tools in Plant Biology

✓ <https://academic.oup.com/plcell/pages/teaching-tools-plant-biology?login=true>

New Members 新血報到

1 Tan Phat Huynh 黃新發 [Yu-Ying Hsieh]



Hello, my name is Phat and I'm from Vietnam. I just recently joined IPMB as a research assistant in Dr. Yu-Ying Hsieh's lab. I finished my bachelor degree in Chemical Engineering at National Taiwan University of Science and Technology. I aspire to understand science from

both the experimental and computational sides, and I am learning more about genetics, bioinformatics and structural biology. Currently I am working to elucidate the functional difference in bacteria's magnesium transporter, with the goal of learning more about biology and experiment design and methods.

2 Yu-Tung Lin 林禹彤 [Chung-Ju Wang]



My name is Yu-Tung, and I am an undergraduate student in the Department of Life Science at NTU. I am a member of Dr. Chung-Ju Wang's lab. I have broad interests in plant science. During my undergraduate studies, I conducted field research on pollination networks of alpine plants in

Taiwan and completed an internship at the Dr. Cecilia Koo Botanic Conservation Center, where I learned techniques for preserving tropical plants. I also had the opportunity to join IPMB as a summer intern last year, where I worked on *Agrobacterium*-mediated transformation in broccoli. This summer, I began studying maize meiosis and have been enjoying learning new techniques and learning about plant genetics and cell biology.

3 Guan-Wen Lee 李冠彬 [Pao-Yang Chen]



Hi everyone, I'm Lee Guanwen, an Information Management major. I am excited to join Dr. Pao-Yang Chen's lab as a public sector summer intern. My research focuses on methylation analysis and high-performance computing (HPC). I look forward to

applying my IT background to biological data and meeting everyone at IPMB!

4 Sze Yue Lee 李詩渝 [Yu-Ying Hsieh]



Everyone calls me Sandra and I graduated from my Master's training at Universiti Malaya, Malaysia, with a project that involved assembling polar fungal whole genomes, molecular species identification, and computational analyses to search and evaluate their

biosynthetic gene clusters. Now at Dr. Yu-Ying Phoebe Hsieh's LAB of PIE, I aim to move my sights beyond computational data and expand my understanding past a singular fungi, by examining how it can interact with other microbes and affect each other as well as their surroundings. I also enjoy going to live music shows, being around greenery and nature, playing badminton and eating good food.

IPMB Calendar 重要行事曆

SEPTEMBER

2026/09/11

Tea Party

2026/09/15

Shang-Fa Yang Memorial Lectures

2026/09/16

Travel Grant Competition

2026/09/22

Distinguished Lecture: Dr. Jane Langdale

OCTOBER

2026/10/17

Academia Sinica Open House

NOVEMBER

2026/11/04-05

Early Career Symposium

Administrative Staff Introduction 行政團隊介紹

1 Academic Affairs 學術事務 / Hsiao-Yun Wang 王筱筠



大家好，我是秘書筱筠！自 101 年加入植微所以來，不知不覺已經和大家一起走過將近 15 年了（驚！）。

除了協助所長相關事務之外，我也負責承辦所內學術評鑑、接待訪賓、聘審案件等業務。但其實我的工作更像所內的「多功能協調站」，接聽大家遇到的各種疑難雜症諮詢，提供最適切的支援，讓老師、同仁和每位來訪的貴賓都能感受到順暢、貼心的行政服務。

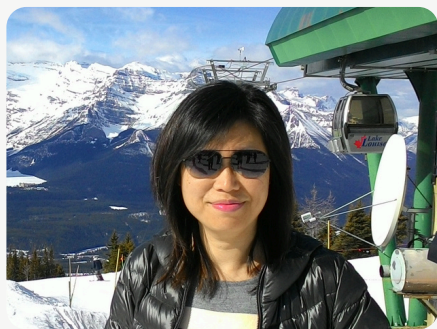
期望自己能成為大家值得信賴的後盾，無論是行政上的大小事、工作遇到卡關、需要抒解壓力，或只是有個小問題想確認，都歡迎隨時來找我！期待和大家一起打造有效率、有溫度，也有凝聚力的植微所！

Hello everyone! I'm Hsiao-Yun. Since joining the institute in 2012, I've been fortunate to grow together with the IPMB community for nearly 15 years.

I support the Director's office and coordinate a variety of administrative affairs, including Academic Advisory Committee, faculty appointments, and hosting visiting guests. Over the years, my role has become a central point of contact for many day-to-day questions and challenges, helping colleagues find the right solutions and ensuring smooth, friendly administrative support across the institute.

I hope to be someone you can rely on. Whether you need help with administrative matters, have a question, run into a problem at work, or simply want to chat, my door is always open. I look forward to continuing to support our IPMB community and helping make it an efficient, welcoming, and enjoyable place to work.

2 Accounting and Cashier 會計出納 / Ing-Tzu Lin 林櫻姿



大家好，我在所內負責公務預算會計業務。主要工作包含概（預）算與決算編製、公務經費及院內計畫經費帳務處理、核銷及預算控管。平日核心任務是審核單據與核銷經費，並作為同仁與院方主計室的溝通橋樑，協助大家瞭解核銷規定，讓本所各項採購、核銷業務得以順暢推動。

我曾任銀行行員、稅務局稅務員及大學出納，長年處理財務數字，養成嚴謹細心的工作態度。很榮幸能加入植微所行政團隊，運用專業協助師長推動研究，未來也期許自己持續精進，提供優質服務。工作之餘，我喜歡走訪郊山步道、擁抱大自然，在山林間紓解壓力，在步履間找回工作與生活的平衡。

Hello everyone! I'm responsible for government-funded accounting and budgeting at IPMB. My work includes preparing budgets and financial reports, managing government and Academia Sinica project accounts, reviewing reimbursement claims, and monitoring budget expenditures. I also serve as a bridge between our colleagues and the AS Accounting Office, helping everyone understand reimbursement policies and ensuring the smooth processing of purchases and financial transactions.

Before joining IPMB, I worked as a bank clerk, tax officer, and university cashier. These experiences helped me develop a careful and detail-oriented approach to financial management. I'm delighted to be part of the IPMB administrative team and to support our researchers through my professional expertise. Outside of work, I enjoy hiking in the mountains and spending time in nature, which helps me recharge and maintain a healthy work-life balance.

3 Comprehensive Affairs 總務採購 / Chia-Chang Cheng 鄭嘉昌



轉眼間來到植微所服務即將滿兩週年！雖然在優秀的行政團隊中我還是個「菜鳥」，但這段日子以來，深深感受到了植微所大家庭的熱情與包容！

我的主要任務是擔任本所機電運作與安全的「幕後推手」，負責高低壓機電、中央空調與門禁監控等設備的維護與合約執行；同時承辦能源查核申報、車輛通行證及事務庫房採購等庶務。當遇上大型活動或防災應變需要支援時，我也會第一時間挺身而出。

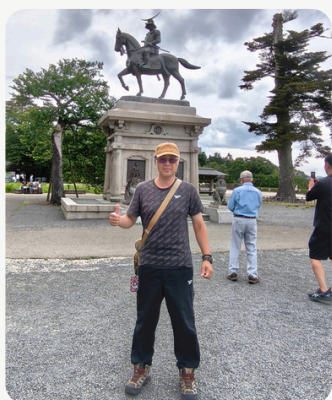
「使命必達、用心盡力」是我的工作哲學。一旦投入工作，我便會發揮專長追求最佳效能；而在與同事的互動、溝通協調與團隊合作中，我也常能從大家身上學到許多，讓自己更加進步。期許自己能持續努力，成為植微所研究團隊最堅實、最安心的後盾，順暢推動各項總務與機電運作！

Hello everyone! It's hard to believe that I'm already approaching my second anniversary at IPMB. Although I'm still one of the newer members of our administrative team, I've truly appreciated the warmth, support, and sense of community at IPMB.

My primary role is to support the institute's facilities and operations behind the scenes. I oversee the maintenance and service contracts for electrical and mechanical systems, including high- and low-voltage equipment, central air conditioning, and access control systems. I also coordinate energy audits, vehicle permits, and general procurement. Whenever major institute events or emergency response efforts require additional support, I'm always ready to help.

I believe in approaching every task with dedication and giving my best. Through working with colleagues, I continue to learn, grow, and improve every day. I look forward to providing reliable support for IPMB's research community by helping ensure the smooth operation of our facilities and administrative services.

4 Comprehensive Affairs 總務採購 / Chih-Jan Wang 王志然



大家好，我是王志然，於 105 年 3 月起於植微所擔任總務人員。

任職期間，主要負責所內行政庶務、財產維護及各項營繕工程的推動。在執行工程時，特別注重溝通與細節，充分考量並貼近各實驗室的特殊需求，確保工程順利進行的同時，能最大程度降低對科研工作的影響，維護優質安全的研發環境。

總務事務繁雜且多涉及公眾事務，各項業務的順利推動，都非常需要大家的耐心支持與理解。私底下的我假日喜歡到戶外踏青、親近自然。非常榮幸能在這裡與優秀的大家一同共事，未來我會持續秉持專業與熱忱，以主動積極的態度協助所務推動，為研究團隊提供最堅實的後勤保障。

Hello everyone! I'm Chih-Jan Wang, and I have been working at IPMB since March 2016.

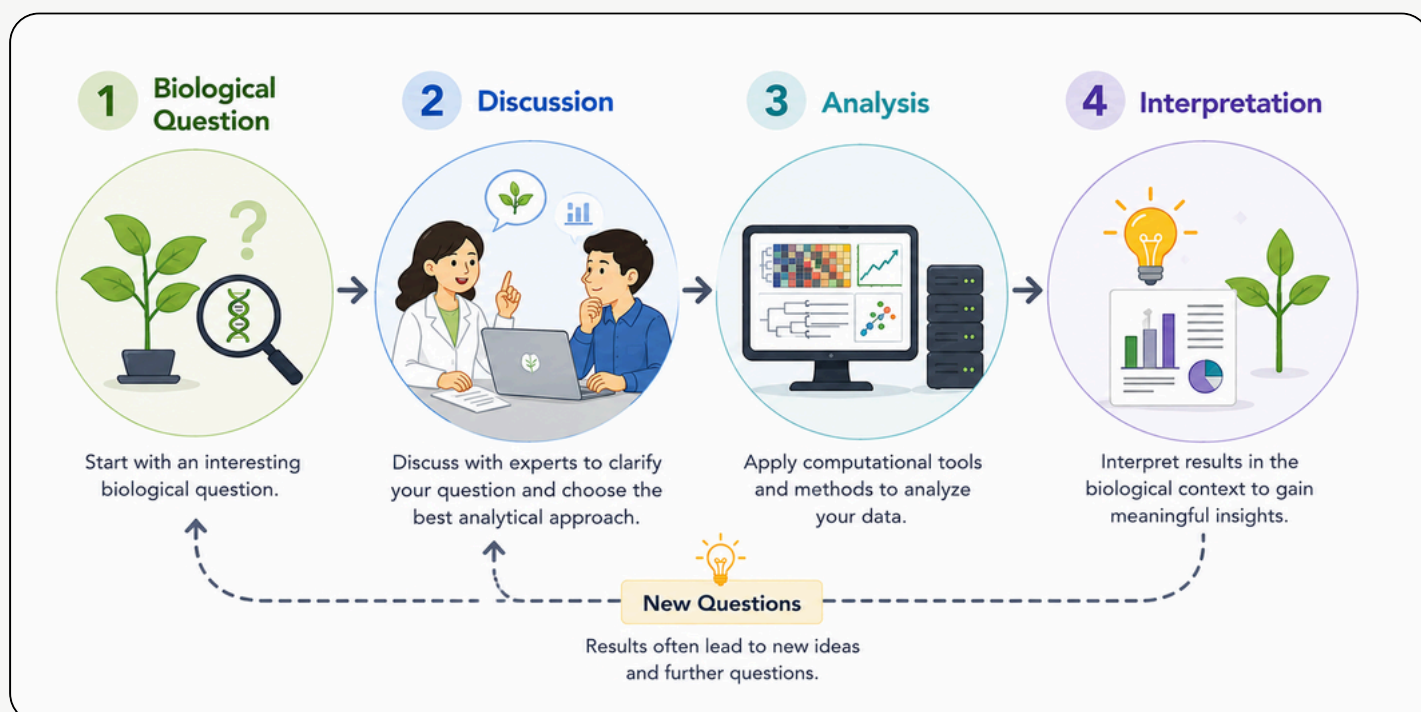
My responsibilities include supporting the institute's administrative operations, maintaining facilities and property, and coordinating renovation and construction projects. For every project, I place great importance on communication and attention to detail, working closely with laboratories to understand their specific needs while minimizing disruptions to research and ensuring a safe, high-quality working environment. Supporting the institute's operations involves a wide range of responsibilities, and the successful completion of many tasks depends on everyone's cooperation and understanding. Outside of work, I enjoy hiking and spending time in nature. It is a privilege to work alongside such talented colleagues at IPMB, and I look forward to continuing to support our research community with professionalism, enthusiasm, and a proactive approach.

Unboxing the Core Lab 開箱核心實驗室: **Bioinformatics** 生物資訊

Bridging Biology and Bioinformatics

Modern biological research generates increasingly large and complex datasets. Turning these data into biological insight requires not only computational tools, but also a clear understanding of the scientific question behind them.

Established in 2007, the IPMB Bioinformatics Core provides computational expertise to support plant and microbial research. The team works closely with researchers to clarify biological questions, identify appropriate analytical approaches, and customize workflows when necessary. Its mission is to facilitate the use of bioinformatics tools and integrate bioinformatics expertise into biological discovery.



What Can the Core Help With?

The Bioinformatics Core has advanced by learning through practice, and over time it has supported a broad range of research needs, including:

1. Genomics & Transcriptomics

DNA-seq and RNA-seq tasks like SNP/InDel calling, structure variant detection, differential expression analysis, and alternative splicing comparison. Also include scRNA-seq tasks like clustering, differential expression, and trajectory analysis.

2. Systems Biology

Co-expression clustering, protein-protein interaction networks, functional gene annotation, and ontology & pathway enrichment.

3. Protein Structure & Interaction

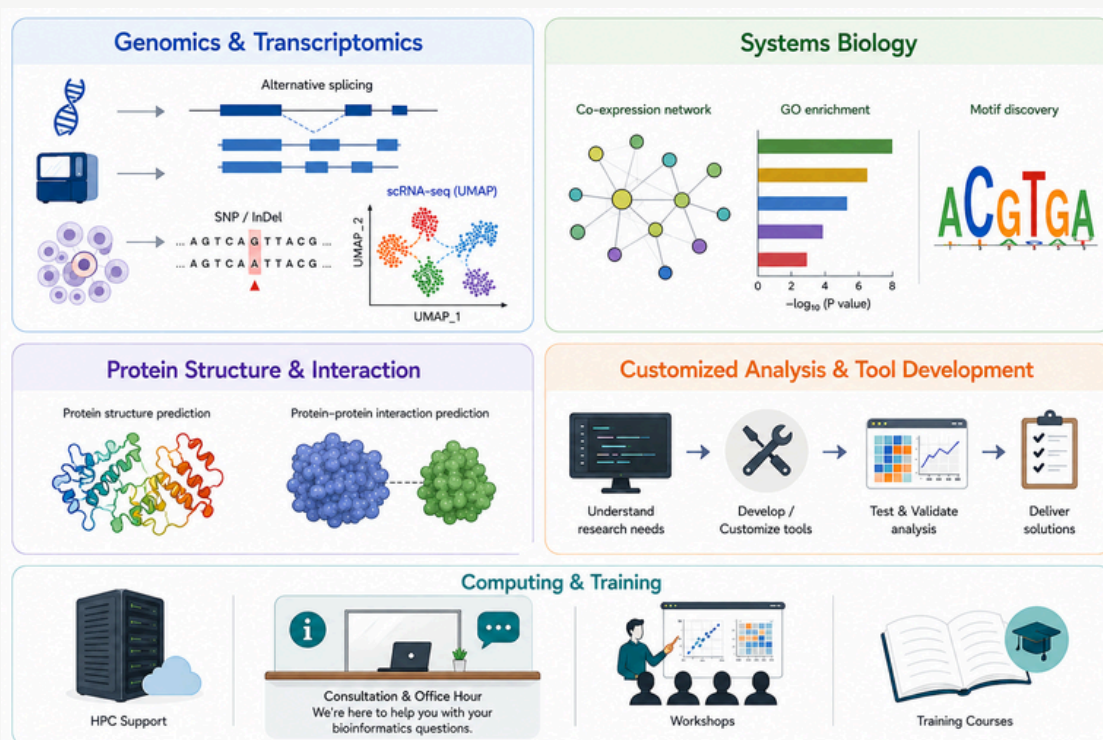
Protein structure prediction, protein-ligand binding prediction, and related structure-based analyses.

4. Customized Analysis & Tool Development

Customized development like developing new programs or organizing existing tools into useable pipelines.

5. Computing & Training

HPC maintenance & consultation, and training workshops for HPC usage and bioinformatics tools.



From Questions to Reproducible Analysis

To begin bioinformatics projects, the Core works with researchers to clarify their scientific questions. This is to translate biology questions into computationally feasible tasks. Each analysis step is carefully documented and reviewed, ensuring that workflows can be reproduced and, when appropriate, formalized into standard operating procedures.

The strength of the Core lies in its reproducibility framework: consistent logging, transparent review, and standardized procedures. These practices guarantee that analyses can be repeated, verified, and extended across projects, providing long-term reliability and confidence in the results.

From Questions to Reproducible Analysis



Ask the Core Team: Questions You Might Be Curious About

Q1

When should I contact the Bioinformatics Core?

As soon as you begin designing experiments or encounter computational challenges – early consultation ensures maximum degree of freedom for downstream analyses.

Q2

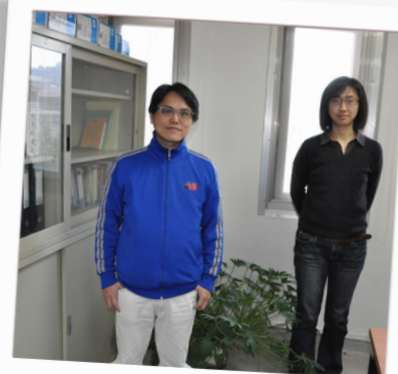
What is the most common question the Bioinformatics Core receives?

How to interpret analysis results of RNA-seq data – from setting (adjusted) p-value thresholds to functional enrichment analysis.

Q3

What's the biggest misconception about bioinformatics?

Many people assume bioinformatics is just running software. While that may seem true in routine cases, the real challenge is making sure the biological question and the algorithm fit together. At the Core, we focus on this alignment and document every step, so results are not only produced but can be reproduced and trusted.



Bioinformatics Core Lab

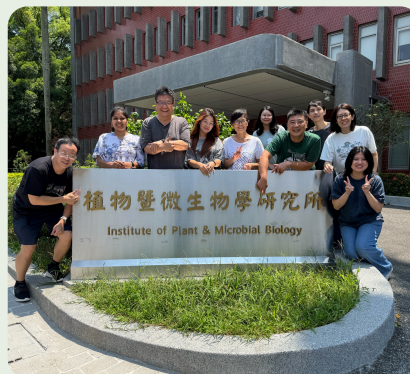
Good News & Achievements 植微人的好消息

NSTC SEED-Young Scholars Program



Congratulations to **Dr. Chih-Hang Wu** on being selected for the NSTC SEED-Young Scholars Program.

NSTC 2026 Future Tech Award



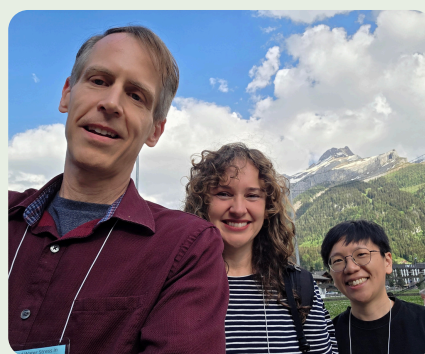
Congratulations to **Dr. Guang-Yu Jauh** and his team on receiving the 2026 Future Tech Award.

Outstanding Performance Award



Congratulations to **Jimmy Lin** on receiving the 2026 Academia Sinica Outstanding Performance Award for Civil Servants.

IPMB at the Gordon Research Conference



IPMB was well represented at the Salt and Water Stress in Plants Gordon Research Conference in Les Diablerets, Switzerland on May 24-29, 2026.

Dr. Paul Verslues was co-chair who organized the conference (with Siobhan Brady of UC-Davis) and **Dr. Ting-Ying Wu** was an invited speaker.

Career Milestone



Congratulations to **Dr. Yueh Cho**, former postdoc in Dr. Shu-Hsing Wu's lab, on joining National Taiwan University as an Assistant Professor in July 2026.



Career Milestone



Congratulations to **Dr. Geng-Jen Jang**, ex-PhD student in Dr. Shu-Hsing Wu's lab, on joining National Taiwan University as an Assistant Professor in August 2026.



Career Milestone



Congratulations to **Dr. Chibbhi Bhaskar**, former postdoc in Dr. Lay-Sun Ma's lab, on starting a postdoctoral position at the Max Planck Institute for Biology Tübingen in October 2026.

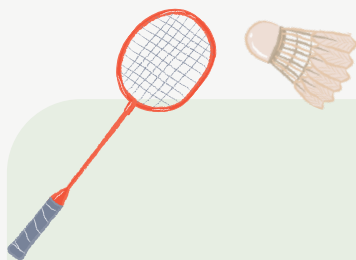


IOM Travel Grant



Congratulations to **Nian-Pu Li** on receiving a travel grant from the International Organization for Mycoplasmaology (IOM) to attend the 26th IOM Congress in Poland in July 2026.





Runner-Up at the 2026 Academia Sinica Badminton Team Tournament



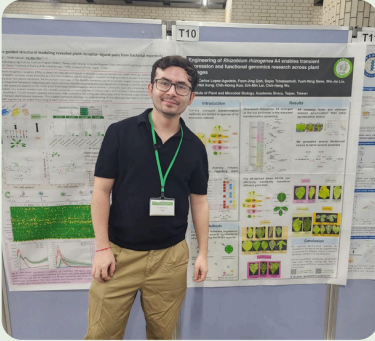
Congratulations to the IPMB badminton team on winning second place at the 2026 Academia Sinica Badminton Team Tournament. Well done to all team members!





Congratulations to Our Graduates

Congratulations to our Ph.D. and master's graduates. We celebrate your achievements and wish you every success in your future academic and professional careers.



Juan Carlos Lopez-Agudelo
(Ph.D.)

[Chih-Hang Wu & Erh-Min Lai]



Xuan Lai
(Ph.D.)

[Erh-Min Lai]



Yung-Hui Wen
(Ph.D.)

[Erh-Min Lai]



Huan-Chi Tien
(Ph.D.)

[Ting-Ying Wu]



Kim-Teng Lee
(Ph.D.)

[Ming-Hsiun Hsieh]



Vu Tran Tuan Kiet
(M.S.)

[Lay-Sun Ma]



Kuan-Yu Lin
(M.S.)

[Chih-Hang Wu]



Wei-Ting Huang
(M.S.)

[Jian-Geng Chiou]



Nian-Pu Li
(M.S.)

[Chih-Horng Kuo]

YIA Spotlight 年輕學者委員會

Young Investigator Association

Stay connected with YIA

1. Contact your YIA lab representative.
2. Visit our website and Facebook group:

YIA Official Website (Travel Grant & Job Opportunities): <https://ipmb.sinica.edu.tw/en/about/youngCommittee>

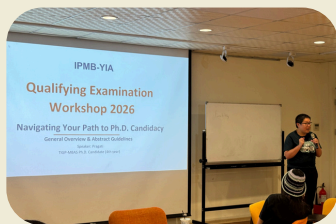
YIA Facebook Group (Activities & Updates): <https://www.facebook.com/groups/504629419562063>



YIA core member group photo

Past Events 活動回顧

[May 28, 2026] QE workshop



Preparing for the QE can be challenging. Through experience sharing, faculty advice, and interactive discussions, the workshop helped students gain practical insights and feel more confident about their upcoming examination.



Young Investigator Association

[June 1, 2026]

1st Cross-Disciplinary Knowledge Exchange Mixer

IPMB CROSS-DISCIPLINARY MIXERS

JOIN THE SERIES & REGISTER NOW

TIMELINE: A SERIES OF 7 MIXERS
FIRST MIXER: JUNE 1 (MON), 12:00-13:30 @ A324.
ALL OTHER DATES: TBD.

ORGANISERS
Organised by: The Young Investigator Association (YIA)

PROPOSED THEMES

- JUNE 1 (MON), 12:00-13:30 @ A324: PLANT BIOLOGY / MICROBIOLOGY / SYMBIOSIS
- TBD: CROP SCIENCE / PLANT IMMUNITY / DEVELOPMENTAL BIOLOGY
- TBD: CELL BIOLOGY / MICROBIAL COMMUNITY / MARINE BIOLOGY
- TBD: ALL IPMB TOPICS OPEN MIXER
- EXPERIMENTAL FAILURES: SHARED STORIES
- FAILURES MAKE US STRONGER: SHARED GROWTH
- UNEXPECTED SUCCESS: AHA! MOMENTS

PURPOSE

- FACILITATE CASUAL SCIENTIFIC EXCHANGE
- LOWER INTERDISCIPLINARY BARRIERS
- INCREASE EXPOSURE TO NEW ADVANCES
- LUNCH WILL BE PROVIDED

NARRATIVE STYLE, NO SLIDES REQUIRED, VERBAL, SHARING OR SHOWING A PICTURE

OPEN TO ALL IPMB MEMBERS



The first YIA Cross-Disciplinary Knowledge Exchange Mixer provided a relaxed environment for IPMB members to introduce their research, exchange ideas, and connect with colleagues from different disciplines. Through open discussion, participants learned about the diverse research taking place across the institute.

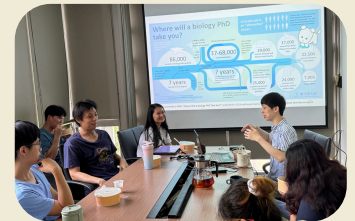


[June 23, 2026]

Early-Career Development Session for Young Scientists



Young scientists gathered for a discussion on early-career development. Participants shared their research experiences, discussed common challenges in academic careers, and exchanged perspectives. The session encouraged open communication and strengthened connections among early-career researchers.



Young Investigator Association

[July 29, 2026]

IPMB x YIA Badminton tournament



Taking a break from experiments, participants picked up their badminton rackets for a series of friendly matches. The tournament was a fun way to recharge, stay active, and enjoy time together outside the laboratory.

[July 31, 2026]

IPMB x YIA table tennis tournament



Research can be demanding, so participants traded pipettes for paddles and enjoyed a series of friendly table tennis matches. The tournament offered a refreshing break from the lab while bringing plenty of energy, laughter, and team spirit.

Featured Events 所內活動精選

Summer Tea Party

2026
06/12



Summer Undergraduate Internship Program

2026
07/01
|
08/31



Symposium of Newly Elected Academicians- Academician Chang-Hsien Yang

2026
07/03



Experimental Rice Field Harvest

2026
07/27



Faculty Retreat

2026
09/01
|
09/02



For any comments or suggestions about this newsletter, please contact Ms. Pei-Ling Wu (lilian541@gate.sinica.edu.tw).