中国科学院植物研究所

INSTITUTE OF BOTANY, THE CHINESE ACADEMY OF SCIENCES

IBCAS

IB–CAS

中国科学院植物研究所

INSTITUTE OF BOTANY, THE CHINESE ACADEMY OF SCIENCES

简　介

中国科学院植物研究所地处美丽的香山脚下，占地74公顷，是我国植物基础科学的综合研究中心。其前身为1928年创建的静生生物调查所和1929年成立的北平研究院植物研究所，1950年合并为中国科学院植物分类研究所，1953年改为中国科学院植物研究所。1950年以来，先后获得国家自然科学奖一等奖2项，其他国家级、中科院和省部级科研成果奖160余项。

植物研究所以“整合植物生物学”为学科定位，围绕与植物学发展密切相关的国家战略需求——生态环境、现代农业、植物资源和系统进化等领域，利用实验生物学（包括“组学”）、生物信息学等最新技术和手段，通过植物系统本身不同组织层次（分子、亚细胞、细胞、组织、器官、个体、群体和生态系统）以及植物科学与相关学科和技术的交叉融合进行整合研究。

植物研究所目前拥有系统与进化植物学研究中心、植物生态学研究中心、分子发育生物学研究中心、光合作用研究中心、信号转导和代谢组学研究中心和植物园；综合办公室、人事教育处和科研计划财务处；文献与信息管理中心，还有系统与进化植物学国家重点实验室、植被与环境变化国家重点实验室、中国科学院光合作用与环境分子生理学重点实验室；内蒙古锡林郭勒草原生态系统国家野外科学观测研究站、内蒙古鄂尔多斯草地生态系统国家野外科学观测研究站、湖北神农架森林生态系统国家野外科学观测研究站、中国科学院北京森林生态系统定位研究站、多伦恢复生态学试验示范研究站、浑善达克沙地生态研究站、中国北方林生态系统定位研究站、东乌珠穆沁草原生态系统管理研究站、华西亚高山植物园；中国生态系统研究网络（CERN）生物分中心。

植物研究所主办的刊物有*Journal of Integrative Plant Biology*（植物学报）(SCI-E)、《植物分类学报》(SCI-E)、《植物生态学报》、《植物学通报》、《生物多样性》、《生命世界》、《中国植物园》、《植物引种驯化集刊》。

植物研究所为国家首批批准的硕士和博士学位授予单位之一，目前博士学位授予点有植物学、发育生物学与生态学；硕士学位授予点有植物学、发育生物学、细胞生物学与生态学。并设有博士后流动站。

IBCAS

A Brief Introduction of IBCAS

The Institute of Botany, the Chinese Academy of Sciences (IBCAS) is located at the foot of the beautiful Fragrant Hills. It occupies an area of 74 hm^2. It is an integrative research center of basic plant sciences in China. Its predecessors were the former Fan Memorial Institute of Biology and the Institute of Botany, Beiping Academy of Sciences set up in 1928 and 1929, respectively. The two institutes were merged into the Institute of Plant Taxonomy, CAS in 1950. In 1953, the Institute changed to its current name. Since 1950, IBCAS has gained two of the First-Class National Natural Science Awards and 140 awards from the CAS and other ministries as well as from provincial awarding organizations.

IBCAS takes "Integrative Plant Biology" as its main research direction, implements comprehensive research projects mainly in the fields of eco-environment, modern agriculture, plant resources and systematic evolution that are highly related to disciplinary development in plant sciences, and is focused on the strategic needs of the nation. This mission can be achieved by means of developing new techniques and modern methodologies. These include, but are not limited to, using various-omics commonly applied in experimental biology and bioinformatics and *via* the inter-disciplinary approach to conduct research on different levels of organization in plant systems, from molecular, subcellular, cellular, tissue, organ, individual, and population to ecosystem together with other relevant disciplines and techniques.

IBCAS contains the Research Center for Systematic and Evolutionary Botany, Research Center for Plant Ecology and Biodiversity Conservation, Research Center for Plant Molecular and Developmental Biology, Research Center for Plant Photosynthesis, Research Center for Signal Transduction and Metabolomics and the Beijing Botanical Garden. The administrative departments include General Office, Division of Personnel and Education, Division of Research and Finance, and Center for Documentation and Information. The institute also has a State Key Laboratory of Systematic and Evolutionary Botany, a State Key Laboratory of Vegetation and Environmental Change, and a CAS Key Laboratory of Photosynthesis and Environmental Molecular Physiology. In addition to these on-campus facilities, it also has nine field stations, including the Inner Mongolia Grassland Ecosystem Research Station, Beijing Forest Ecosystem Research Station, Ordos Sandland Ecosystem Research Station, Shennongjia Biodiversity Research Station, Otindag Sandland Ecological Research Station, Duolun Station for Restoration Ecology, Eco-system of North Forest Research Station, East Ujumchin Grassland Ecosystem Research Station (EUGERS), and the West China Subalpine Botanical Garden. The institute is also headquarters for the Biological Sub-Center of the Chinese Ecosystem Research Network (CERN).

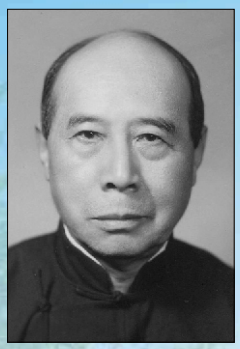
IBCAS sponsors several important national journals, namely, *Journal of Integrative Plant Biology*, *Acta Phytotaxonomica Sinica*, *Journal of Plant Ecology*, *Chinese Bulletin of Botany*, *Biodiversity Science*, *Life World*, *Chinese Botanical Gardens, Collected Papers of Plant Introduction and Acclimatization*, etc.

IBCAS is one of the institutions first approved to confer master's and doctor degrees. At present, it has Ph.D programs in botany, developmental biology and ecology, and master's programs in botany, developmental biology, cellular biology and ecology. The IBCAS is also a national base for postdoctoral trainings.

现任所长
Present Director of the Institute

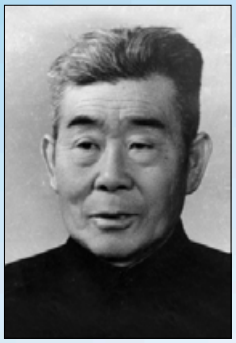
马克平
Keping Ma
[2006.4-]

历任所长
Former Directors of the Institute



秉 志 Chih Ping
[1928－1932]
(静生生物调查所)
Fan Memorial Institute of Biology

胡先骕 Hsen-hsu Hu
[1932－1949]
(静生生物调查所)
Fan Memorial Institute of Biology



刘慎谔Liou Tchen-ngo
[1929－1950]
(北平研究院植物研究所)
Institute of Botany, Beiping Academy of Sciences

钱崇澍Chien Sung-shu
[1950－1965]

汤佩松 Peisung Tang
[1978－1982]

钱迎倩 Yingqian Qian
[1982－1987]

路安民 Anmin Lu
[1987－1990]

张新时 Xinshi Zhang
[1990－1998]

韩兴国 Xingguo Han
[1998－2006]

组织机构设置
Organizations

中国科学院植物研究所
Institute of Botany, the Chinese Academy of Sciences

所　长
Director

所务委员会
Institute's Administrative Committee

学术委员会
Academic Committee

学位委员会
Academic Degree Approval Committee

综合办公室
General Office

人事教育处
Division of Personnel and Education

科研计划财务处
Division of Management for Research and Finance

文献与信息管理中心
Center for Documentation and Information

系统与进化植物学国家重点实验室
State Key Laboratory of Systematic & Evolutionary Botany

系统与进化植物学研究中心
Research Center for Systematic and Evolutionary Botany

植物标本馆
Herbarium (PE)

植被与环境变化国家重点实验室
State Key Laboratory of Vegetation and Environmental Change

植物生态学研究中心
Research Center for Plant Ecology

9个野外生态定位研究站
9 Field Stations

中国科学院光合作用与环境分子生理学重点实验室
Key Laboratory of Photosynthesis and Environmental Molecular Physiology, CAS

光合作用研究中心
Research Center for Plant Photosynthesis

分子发育生物学研究中心
Research Center for Molecular and Developmental Biology

信号转导与代谢组学研究中心
Research Center for Signal Transduction and Metabolomics

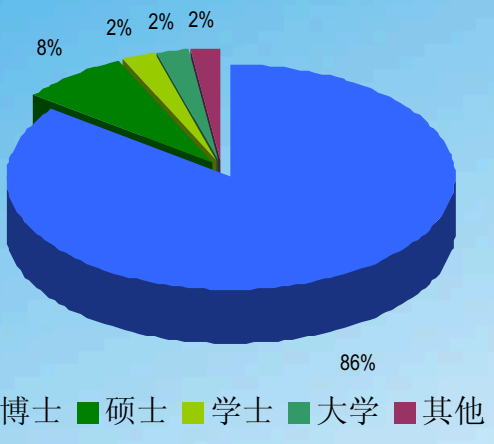
北　京　植　物　园
Beijing Botanical Garden

队伍建设

Faculty and Staff

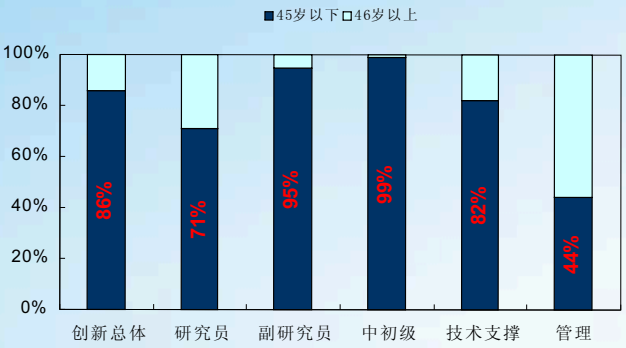
“科技创新，以人为本”。植物研究所在凝炼科学目标、合理布局学科的基础上，以科技创新队伍知识结构的优化和调整为主线，以将帅人才的凝聚和培养为重点，坚持“善用现有人才，吸引优秀人才，培养未来人才”的原则，人才引进和人才培养并举，将人才引进和培养与推进科技创新跨越发展战略、造就将帅人才相结合，全方位、多层次加强科技人才队伍的建设，为各类人才积极创造科技创新环境和公平竞争平台,努力提升科技创新队伍的整体科研创新水平。近年来，共引进国内外各类人才45人，其中执行中的“百人计划”人才10人。国家杰出青年基金获得者9人，国家自然科学基金委创新群体2个。在人才培养和队伍建设方面取得了长足的进步，基本形成了知识、年龄结构不断优化，学科布局合理的人才队伍。

Talents play an important role in S&T innovation. In accordance with our academic mission, IBCAS has taken great steps to attracting new talents and training young scientists. Our human resource policies are aimed to properly use existing talents, attract and train young talents, and initiate training programs for future talents. More importantly, IBCAS has made great efforts to create a fair competition mechanism and to invest largely on improving infrastructure and research facilities, which has been shown very effective in both new talents recruitment and performance enhancement. Recently, 45 new faculty members have been recruited from abroad and other institutions within China. Among that, 10 faculty members have obtained the “Hundred Talents Program”. 9 faculty members have obtained the National Excellent Youth Foundation, and the institute has two innovative groups of National Science Foundation of China. Great progress has been made in talent training and team construction. Currently, we have established a research team with reasonable age structure and expertise.



创新基地内人员的知识结构

Degree Structure of the Research Team



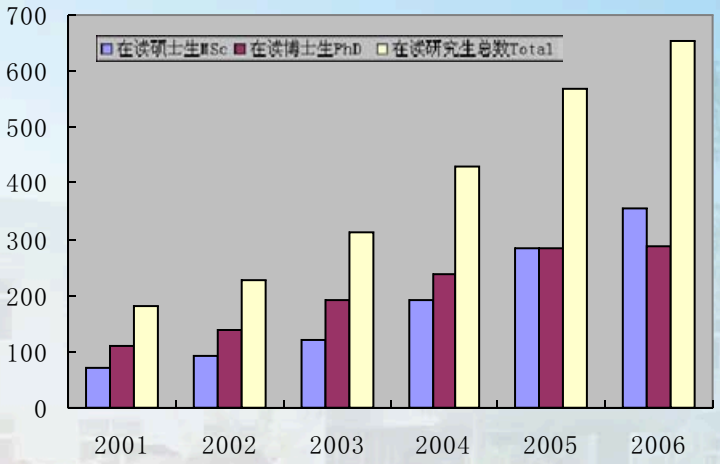
创新基地内人员的年龄分布

Age Structure of the Research Staff

人 才 培 养
Education

植物研究所是国家首批批准的硕士与博士学位授予单位之一，也是国家首批批准设立博士后科研流动站的单位之一。博士培养点有：植物学、发育生物学、生态学。硕士培养点有：植物学、发育生物学、细胞生物学、生态学。现有在岗博士研究生导师55人，在岗硕士研究生导师53人，在学研究生624人，在站博士后47人。植物研究所已成为我国植物学高科技人才培养基地。

植物研究所以整合植物生物学为学科定位，以植物对环境适应的生物学基础为主要研究方向，以绿色高效农业和生态环境的国家需求为重要研究领域，重点在植物的系统发育和进化、陆地植被/生态系统与全球变化、资源植物分子与发育生物学、植物信号转导与代谢组学、生物多样性保育与可持续利用等方面开展系统的研究工作。目前，拥有系统与进化植物学国家重点实验室、植被与环境变化国家重点实验室、中国科学院光合作用与环境分子生理学重点实验室；研究单元包括系统与进化植物学研究中心、植物生态学研究中心、分子发育生物学研究中心、光合作用研究中心、信号转导与代谢组学研究中心和北京植物园。



历年研究生招生规模

Enrollments of postgraduate students in the past 6 years (MSc, PhD, Total)

IBCAS was selected to be the institute to confer MSc degrees in Botany, Developmental Biology, Cell Biology and Ecology and PhD degrees in Botany, Developmental Biology and Ecology. Currently, there are 55 doctor supervisors and 53 master supervisors with 624 graduate students and 47 post-doctors in the institute.

The mission of the institute is to undertake basic research in plant biology through multidisciplinary and integrative approaches. The major research fields include plant systematics and evolution, ecosystem and vegetation under the background of global change, formative mechanism of biodiversity and its conservation, molecular and developmental basis of green and high-efficiency agriculture and biotechnology for the utilization of plant resources, plant signal transduction, and plant metabolomics. IBCAS contains three key laboratories: the State Key Laboratory of Systematic and Evolutionary Botany, the State Key Laboratory of Vegetation and Environmental Change, and the CAS Key Laboratory of Photosynthesis and Environmental Molecular Physiology. There are currently 6 research departments in the institute: Research Center of Systematic & Evolutionary Botany, Research Center of Plant Ecology, Research Center of Molecular and Developmental Biology, Research Center of Photosynthesis, Research Center of Signal Transduction and Metabolomics and Beijing Botanical Garden.

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重要科技成果
Principal Scientific and Technical Achievements

进入知识创新工程试点以来，植物研究所以优势学科领域和重要学术方向为背景，面向国家重大战略需求和国际科学前沿，承担了一大批国家、中国科学院和地方的重大项目和研究课题，围绕植物与环境相互关系的生物学基础研究，在植物系统发育重建和进化机制、陆地生态系统对全球变化响应与适应、生物多样性形成机制与保护途径、绿色高效农业分子基础与资源植物利用生物技术等方面开展了系统的研究工作，在国内和国际上取得了具有一定影响力的科技创新成就。这些重要创新研究成果不仅引起了国际同行的广泛关注，更重要的是进一步提升了植物研究所在植物对环境适应的生物学基础研究领域的国际地位。

Since the commencement of the KIP (Knowledge Innovation Project) of CAS, IBCAS has taken advantage of the multiplicity of its disciplines and edge-cutting research fields. In accordance with the strategic needs of the country and the frontiers in life sciences, IBCAS has undertaken a large batch of important and major research projects sponsored by the state, CAS and many other funding agencies. Focusing on the basic research of biology on how plants interact with the physical environment, IBCAS has obtained grants to support studies on phylogenetic reconstruction and evolutionary mechanism, global change, the mechanism of biodiversity formation and conservation, modern agriculture at both molecular and organismal levels and biotechnology for the utilization of plant resources. These research projects have produced many important publications and created new technologies that have national and international influences.

△ 《中国兰科植物研究》获国家自然科学二等奖(2002年)

"Study on the Orchidaceae in China" received a National Natural Science Award (Second Class) in 2002

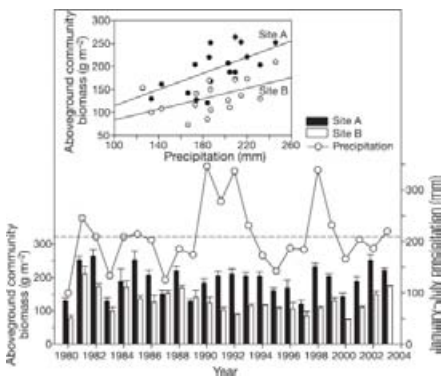
◁ 2004年全部正式出版的《中国植物志》是目前世界上最大型、收录植物种类最丰富的一部巨著。全书80卷126分册，5 000多万字，记载了我国301科3 408属31 132种维管束植物。该书基于我国四代植物学家80年工作的积累、45年艰辛的编撰才得以最终完成。

Flora Reipublicae Popularis Sinicae (FRPS), a comprehensive flora of China, consists of 80 volumes (in 126 fascicles). This was accomplished by the efforts of Chinese botanists for four generations. The publication of this series of books has been the result of 45 years of hardwork since 1959. There are a total of 301 families, 3 408 genera and 31 132 species of vascular plants native to China (*Science*, 2005).

▷ 匡廷云院士与中国科学院生物物理研究所合作，成功获得2.72Å分辨率的菠菜LHC-II晶体结构解析，发表在*Nature*，在国内外引起较大的反响。此成果入选"2004年中国十大科技新闻"。

"Crystal structure of spinach major light-harvesting complex at 2.72 Å resolution" was awarded as one of "the Ten Great Science and Technology News of China" in 2004.

Nature 2004, **428**: 287–292



Ecosystem stability and compensatory effects in the Inner Mongolia grassland

Yongfei Bai[1], Xingguo Han[1], Jianguo Wu[1,2], Zuozhong Chen[1] & Linghao Li[1]

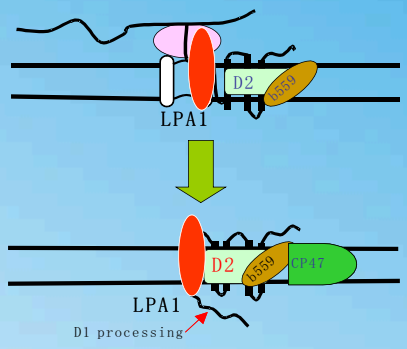
[1]*Laboratory of Quantitative Vegetation Ecology, Institute of Botany, Chinese Academy of Sciences, Beijing 100093, China*
[2]*Faculty of Ecology, Evolution and Environmental Science, School of Life Sciences Arizona State University, Tempe, Arizona 85287-4501, USA*

Nature 2004, **431**:181–184

内蒙古典型草原生产力稳定性维持机制

重要科技成果

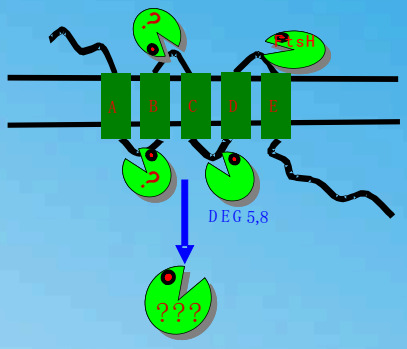
Principal Scientific and Technical Achievements



LPA1作为光系统II反应中心蛋白D1相互作用的膜蛋白分子伴侣，促进PSII复合物的组装

LPA1 appears to be an integral membrane chaperone that is required for efficient PSII assembly.

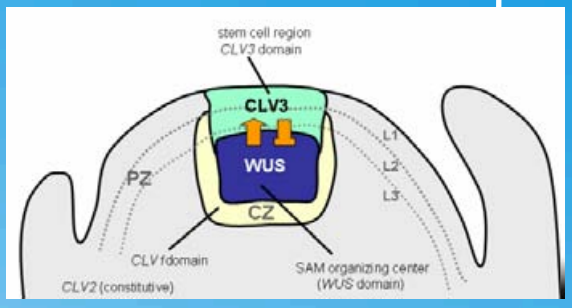
Peng LW, Ma JF, Chi W, Guo JK, Zhu SY, Lu QT, Lu CM, Zhang LX. ***Plant Cell*** 2006, 16: 955−969.



DEG5和DEG8协同作用参与PSII 反应中心D1蛋白质在CD −loop 上的初级剪切

DEG5 and DEG8 have a synergistic function in the primary cleavage of the CD loop of the PSII reaction center protein D1.

Sun XW, Peng LW, Guo JK, Chi W, Ma JF, Lu CM, Zhang LX*. ***Plant Cell*** 2007, doi/ 10.1105.

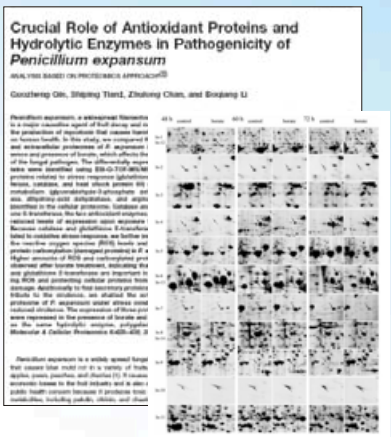


我们发现CLV3和CLE19是以小分子多肽的形式调节生长点中干细胞的数目

We demonstrated that CLV3 and CLE19 functions as small peptides to regulate the number of stem cells in the shoot apical meristem.

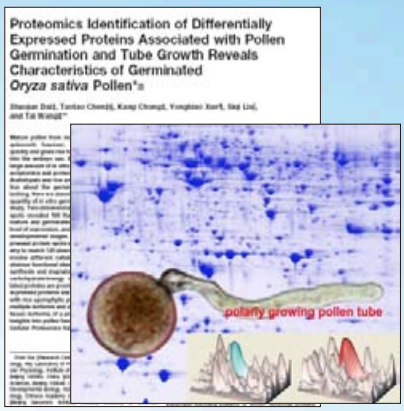
Plant Physiology, 2006

Curr Opini Plant Biol, 2007


Crucial Role of Antioxidant Proteins and Hydrolytic Enzymes in Pathogenicity of *Penicillium expansum*

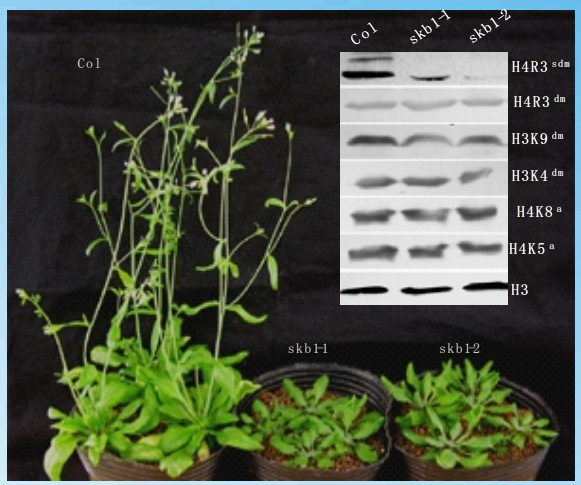
蛋白质组学研究揭示了过氧化氢酶与谷胱甘肽转移酶在清除病源菌胞内过氧化氢中的重要作用

Qin et al.. ***Molecular & Cellular Proteomics*** 2006, doi:10.1074/mcp. M600179−MCP200



发现花粉区别于营养细胞的重要特征是其蛋白质组包含高比例的壁合成与可塑性相关的蛋白质，提出了花粉管壁动态的调控在花粉管极性生长过程中起重要作用的观点

Dai SJ, Chen TT, Chong K, Xue YB, Liu SQ, Wang T. ***Molecular & Cellular Proteomics*** 2007, 6:207−230



发现组蛋白精氨酸甲基化控制开花过程的表观遗传学新模式

Wang X, Zhang Y, Ma QB, Zhang ZL, Xue YB, Bao SL*, Chong K*. SKB1-mediated symmetric dimethylation of histone H4R3 controls flowering time in Arabidopsis. ***The EMBO Journal*** 2007, doi:10.1038/ sj.emboj. 7601647

稻属C染色体组物种是两次快速物种形成(0.3−0.4 mya)的产物，*O. eichingeri*从西非向亚洲斯里兰卡的长距离扩散形成了该种的洲际间断分布

Two speciation events occurred within short time (0.3−0.4 mya) in C-genome *Oryza* species, and a long-distance dispersal from West Africa to Sri Lanka results in the disjunct *O. Eichingeri.*

Zhang LB, Ge S*. ***Mol Biol Evol*** 2007, 24:769−783

水稻只保留了祖先种遗传多样性的20%−30%，说明在其驯化过程中发生了严重的瓶颈效应

Oryza sativa retains only 20%−30% of the diversity in its wild species, indicating a severe bottleneck during domestication of rice.

Zhu Q, Zheng X, Luo J, Gaut BS, Ge S*. ***Mol Biol Evol*** 2007, 24:875−888

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国际合作与交流
International Cooperation and Exchange

国际合作与交流是提高研究水平、扩大影响力的重要举措。植物研究所从国际科技合作的发展趋势和战略需求分析，紧密围绕国家目标，结合中国科学院知识创新工程总体部署和植物研究所学科发展战略，瞄准国际前沿，致力于创新能力和科技基础平台建设，广泛开展与国际著名研究机构或高等院校的多形式、多层次合作，建立长期、有效、平等互利和实质性的合作平台和合作关系，提高国际竞争能力，鼓励研究人员通过参加国际合作项目实现本土人才国际化，尽快缩短与国际先进水平的差距，造就一批国际级的著名科学家，使植物研究所成为世界上有重要影响的研究机构。

英文版“Flora of China”是国际合作项目，全书共25卷，现已出版11卷，图版10册，由科学出版社与美国密苏里植物园出版社共同出版. 联合编委会的中方主席为吴征镒院士，副主席为洪德元院士，外方主席为Peter H. Raven院士。

“Flora of China”, a revised English edition of FRPS, is an internationally cooperative project with 25 volumes in total. Eleven volumes and ten books of illustrations have been published up to now by the Science Press and the Missouri Botanical Garden Press. The co-chairs of the editorial committee are academician Zhengyi Wu and academician Peter H. Raven; the vice co-chair is academician Deyuan Hong.

International cooperation and exchange is an important means by which the research level can be raised and the influence of the institute can be expanded. By analyses of developmental trends and strategic needs of international cooperation, IBCAS has extensively carried out cooperation by various means and at different levels with well-known research organizations and universities in the world. Long-term effective and practical cooperation on the basis of equality and mutual benefit has been established in line with the KIP (Knowledge Innovation Project) of CAS and the development strategy for the future institute. Aiming at the international frontier, IBCAS has devoted itself to raising its innovation capacity and to further invest in large new facilities as more new faculty members come in. We also encourage scientists to establish new international connections in order to raise the institute's international competitive capacity, to gain international experience for those who are trained at home universities or institutes, to quickly narrow the gap between our institute and leading international counterparts. We are confident that in the near future a batch of well-known scientists from IBCAS will walk onto the stages of the international scientific community.

英国Reading大学的Frank Bisby教授与马克平所长讨论建立物种2000项目中国节点的事宜

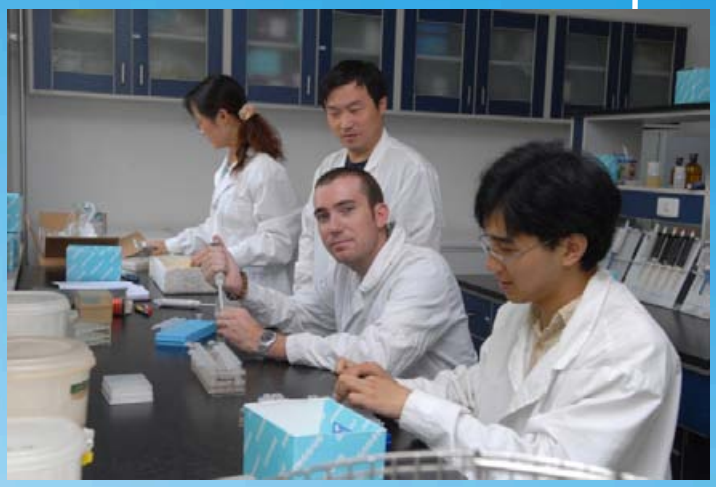
Prof. Keping Ma Director General for IOB talked with Prof. Frank Bisby Executive Director for Species 2000 on the possibility to set up a China Node for the project. Dr. Bisby is a Professor of Plant Taxonomy in University of Reading, UK.

中俄科学家联合野外考察

Joint Expedition of Sino-Russia Scientists

△ 中华人民共和国援外项目——蒙古草原生态系统定位研究站建设方案

The Construction Plan of Mongolian Grassland Ecosystem Research Station sponsored by a Foreign Aid Project in Science and Technology of the People's Republic of China



△ 来自西班牙的J. Lopez-pujol博士在植物研究所进行博士后研究

Dr. J. Lopez-Pujol, a postdoctoral fellow from Spain, is working in the laboratory

◁ 由植物研究所主办的第二届国际植物神经生物学研讨会2006年5月在中德中心(北京)召开

The Second International Symposium on Plant Neurobiology sponsored by IBCAS in 2006

▷ 2006年6月12日，由植物研究所主办的第七届国际树木年轮学大会在北京召开

The 7th International Conference on Dendrochronology sponsored by IBCAS in 2006

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系统与进化植物学研究中心

Research Center for Systematic and Evolutionary Botany (CSEB)

该研究中心成立于1998年，由原中科院系统与进化植物学开放研究实验室、植物分类研究室（标本馆）和古植物研究室合并而成。2004年在原中科院系统与进化植物学重点实验室的基础上，通过整合标本馆、古植物馆和大化石实验室等成立系统与进化植物学国家重点实验室。该中心（重点实验室）主要研究方向为：植物分类-生物地理学、植物的起源和系统发育重建、居群生物学和保护遗传学、进化发育生物学和进化基因组学等。多年来，中心（重点实验室）在植物系统发育重建和进化机制、裸子植物分子系统学、物种形成和生物地理学、稻属和稻族的分子系统学及物种形成、被子植物花发育的进化发育生物学等方面取得了重要进展。该中心（重点实验室）现有科技人员65人，其中中科院院士2人。现任中心主任为汪小全研究员，学术委员会主任为洪德元院士。

This center was established in 1998 by merging the Key Laboratory of Systematic and Evolutionary Botany, the Chinese Academy of Sciences (CAS), Department of Plant Taxonomy, and Department of Palaeobotany of the institute. Integrating the Herbarium (PE) and the National Museum of Plant History of China, the laboratory was upgraded to State Key Laboratory of Systematic and Evolutionary Botany in 2005. The mission of the center (or the state key laboratory) is to discover and transmit knowledge in basic plant biology, especially plant taxonomy, biogeography, phylogeny, population biology and speciation, conservation biology, evolutionary genomics, and Evo-Devo. In the center there are 65 staff members including 2 academicians of CAS. The current director is Prof. Xiao-Quan Wang, and the director of the academic committee is academician De-Yuan Hong.

目前，研究中心设立了9个创新研究组：

Currently 9 research groups have been designated in the center:

1. 植被演替和环境演变创新研究组（组长：李承森研究员）
   Vegetation succession and environmental changes (PI, Chengsen Li)
2. 种子植物分类创新研究组（组长：傅德志研究员）
   Seed plant taxonomy (PI, Dezhi Fu)
3. 物种多样性及其形成机制创新研究组（组长：杨亲二研究员）
   Species diversity and conservation biology (PI, Qiner Yang)
4. 植物系统发育重建创新研究组（组长：陈之端研究员）
   Phylogenetic reconstruction of seed plants (PI, Zhiduan Chen)
5. 植物分子生物地理学创新研究组（组长：汪小全研究员）
   Plant molecular systematics and biogeography (PI, Xiao-Quan Wang)
6. 居群生物学和进化生物学创新研究组（组长：葛颂研究员）
   Population biology and evolutionary biology (PI, Song Ge)
7. 基因、染色体和基因组进化创新研究组（组长：张大明研究员）
   Gene, chromosome and genome evolution (PI, Daming Zhang)
8. 植物生态与进化基因组学创新研究组（组长：鲁迎青研究员）
   Evolutionary and ecological genomics (PI, Yingqing Lu)
9. 植物系统发生与进化发育创新研究组（组长：王印政研究员）
   Plant systematics and evolutionary developmental biology (evo-devo) (PI, Yinzheng Wang)

洪德元院士
Academician De-Yuan Hong

野外考察 Expedition

系统与进化植物学国家重点实验室

State Key Laboratory of Systematic and Evolutionary Botany (LSEB)

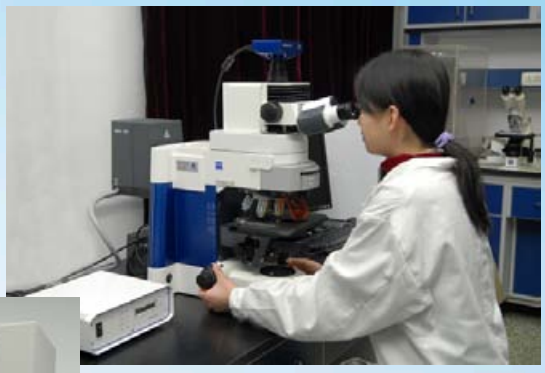
该国家重点实验室由标本馆和专业实验室组成。标本馆保存有230万号植物腊叶标本和8万号种子标本以及7万余号化石标本，是世界上最大的标本馆之一。专业实验室有大化石室、结构植物学室、显微镜室、染色体分析室、蛋白质分析室、DNA测序室、分子克隆室、分子杂交室、生物信息分析室、组培室和实验温室等。各专业实验室拥有一系列大型精密仪器，如扫描电子显微镜、激光共聚焦显微镜、荧光万能显微镜、AB3730xl DNA分析仪、实时定量PCR仪等，可以开展从宏观到微观不同层次的研究。

系统与进化植物学国家重点实验室在强化各专业实验室和标本馆建设的同时，开展了国际前沿性的研究，取得了一大批研究成果，已成为该领域有国际影响的实验室之一。系统与进化植物学国家重点实验室不仅是该领域最具活力的研究团队和重要支撑平台，也是培养人才的基地，目前已经培养了200多名博士和硕士研究生。现任实验室主任为葛颂研究员，学术委员会主任为洪德元院士。

The State Key Laboratory of Systematic and Evolutionary Botany (LSEB) consists of 10 research groups, and its facilities include the Herbarium (PE) and a number of dedicated labs. PE houses 2.33 million plant specimens and 70 000 plant fossils. The dedicated labs are equiped with modern instruments including a scanning electron microscope, fluorescent microscope, confocal microscope, AB3730xl DNA analyzer, real-time PCR cycler, and large-scale parallel computer, which can be used for studies on palaeobotany, structural botany, cytology, molecular systematics and evolution, evolutionary genomics, Evo-Devo, and bioinformatics. The current director of LSEB is Prof. Song Ge, and the director of the academic committee is academician of CAS De-Yuan Hong.

重点实验室拥有的部分精密仪器设备
Facilities in LSEB

△ 扫描电子显微镜
Scanning electron microscope



△ 荧光万能显微镜
Fluorescent microscope

◁ AB3730xl全自动DNA测序仪
ABI3730xl DNA analyzer

◁ 大型并行计算机
Large-scale parallel computer

实时定量PCR仪 ▷
Real-time PCR cycler

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植 物 标 本 馆
Herbarium (PE)

居于亚洲首位的中国科学院植物研究所标本馆建筑面积达11 000平方米，馆藏标本245万号

The Herbarium (PE), the largest in Asia, has collection of 2.45 million sheets of plant specimens within an area of 11 000 m^2

中国科学院植物研究所标本馆的历史可追溯到1928年成立的北平静生生物调查所植物部标本室和1929年成立的北平研究院植物研究所标本室。近80年来，经过几代植物学家和技术人员的艰苦努力，已发展为亚洲最大的植物标本馆，目前馆藏标本逾245万号（含8万号种子标本和7万号化石植物标本），并妥善保藏了1万余份模式标本。

标本馆现有8个经典分类研究岗位，根据标本馆的发展，将逐步完善有关类群研究岗位的布局。现任名誉馆长为洪德元院士，馆长为李良千研究员。

标本馆的定位和目标：充分利用现有的人才优势和资源优势，建设成为东亚植物标本的保藏中心和经典分类研究中心，在馆藏标本、研究和管理水平以及硬件设施等方面力争达到国际一流水平。

标本馆的发展规划：1. 通过采集和交换（特别是收集我国没有分布的分类群）等途径，增加标本馆藏量；2. 建立稳定的经典分类研究队伍，培养后备人才，深入开展植物分类学研究；3. 加快标本馆数据库的建设；4. 进一步加快植物学科普教育基地的建设。

The history of the Herbarium (PE), Institute of Botany, the Chinese Academy of Sciences can be traced back to the Herbarium, Department of Botany, the Fan Memorial Institute of Biology, Peiping (1928), as well as the Herbarium, Institute of Botany, the National Academy of Peiping (1929). During the past eight decades, PE has developed into the largest herbarium in Asia. The current collection contains more than 2 450 000 specimens (including 80 000 seed collections and 70 000 plant fossil samples). In addition, over 10 000 type specimens are preserved and maintained in the herbarium. The herbarium currently has seven systematic positions. According to the future plan of herbarium development, research poistions of various plant groups will be fulfilled to reflect an adequate coverage of plant systematics. The current honorary curator is academician of CAS De-Yuan Hong, and the curator is Prof. Liang-Qian Li.

The mission of the PE is to make full use of the current strengths of its staff members and collections, to develop itself into a center of East-Asian plant specimen collections and research on plant taxonomy, and to lead internationally in collection-based research and herbarium management.

The future developments of PE will include increasing the herbarium collection by expanding its current collecting and exchange programs (particularly emphasizing groups distributed outside of China), setting up a strong research team of taxonomists, training the future generation of taxonomists, further developing the virtual herbarium, and strengthening the public education programs in plant sciences.

标本馆具有良好的保藏条件和工作环境

The PE has good facilities for the preservation of plant specimens and a favourable environment for work

中国古植物馆于1996年落成，馆藏7万多号珍贵的化石标本

The National Museum of Plant History of China was built in 1996 and houses over 70 000 samples of plant fossils

植 物 标 本 馆
Herbarium (PE)

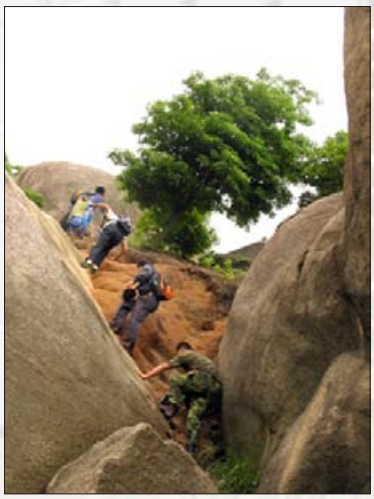
几十年来，植物标本馆以其丰富的馆藏量、良好的工作条件和管理水平吸引着众多专家学者，迄今已与39个国家和地区的100余个植物标本馆建立了标本借阅和交换业务，为《中国植物志》等一系列专著的编研、植物学学科的发展和科普教育做出了重要贡献。

Though the years, the Herbarium has attracted many experts and researchers by its rich collections and excellent facilities. To date, the herbarium has set up specimen loan and exchange programs with over 100 herbaria of 39 countries and districts worldwide. PE has made important contributions to the research and compilation of major floristic and monographic studies, such as the *Flora Reipublicae Popularis Sinicae*, as well as to the development of modern botany and public education in plant sciences.

王文采院士正在查阅标本
Academician Wentsai Wang is examining plant specimens

国际合作与交流 Collaboration

马克平所长向白春礼常务副院长介绍标本馆藏情况
Prof. Keping Ma, Director General is introducing the specimens stored in the Herbarium to Chunli Bai, the Standing Vice President of the CAS



野外考察后处理标本
Treating plant specimens after expedition

植物标本馆已经完成了140万份蜡叶标本的数字化工作
Project of database in the PE

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植物生态学研究中心
Research Center for Plant Ecology


生态楼 Building for Ecology

该中心成立于1998年，以1950年建立的植物生态学研究室为基础发展而来，现由植被与环境变化国家重点实验室、8个野外研究站（其中3个国家野外科学观测研究站）和1个植物园组成，中国生态系统研究网络（CERN）生物分中心挂靠在该中心，现任主任为董鸣研究员。主要研究方向为：(1) 生态系统的结构、功能、动态模拟和管理；(2) 全球变化与陆地生态系统的关系、模拟和生态信息系统；(3) 生物多样性监测及其生态系统功能。

多年来，中心围绕全球变化背景下的整合植物生态学，在北方沙地草地生态系统结构与功能和恢复重建、克隆植物的适应生态学、全球变化与陆地植被／生态系统、生态环境安全和生物多样性变化、保育与可持续利用等方面进行了大量野外调查控制实验和理论研究，取得了重要成就。

The Research Center for Plant Ecology was founded in 1998; its origin was the Department of Plant Ecology which was founded in 1950. The research center consists of one state key laboratory (State Key Laboratory of Vegetation and Environmental Change), 8 field stations including 3 national stations, and one botanical garden. The current head of the center is Prof. Dr. Ming Dong. The center has determined the following major research foci: (1) the structure, function, dynamic simulation and management of ecosystems; (2) global change and terrestrial ecosystems, simulation, and construction of corresponding ecological information systems; and (3) biodiversity and their significance in ecosystem functioning.

In the framework of integrative plant ecology under global change, the center has made a number of achievements during the past half century in research areas such as structure and functioning relationships as well as restoration/reconstruction of northern China sandland and grassland ecosystems, the adaptation of clonal plants, global change and terrestrial vegetation/ecosystem, eco-safety of environment, and variation and conservation of biodiversity and its sustainable utilization.

目前本中心设立12个研究组：

Based on the current research hot spots and individual research interests, the Center has established 12 research groups:

1. 生物多样性与生物安全创新研究组（组长：马克平研究员）
   Biodiversity and biosafety (PI, Keping Ma)
2. 生态系统的适应与进化创新研究组（组长：董鸣研究员）
   Adaptation and evolution in ecosystems (PI, Ming Dong)
3. 全球变化与陆地生态系统创新研究组（组长：周广胜研究员）
   Global change and terrestrial ecosystems (PI, Guangsheng Zhou)
4. 生物地球化学创新研究组（组长：韩兴国研究员）
   Biogeochemistry (PI, Xingguo Han)
5. 植物生理生态学创新研究组（组长：蒋高明研究员）
   Plant eco-physiology (PI, Gaoming Jiang)
6. 保护生态学创新研究组（组长：谢宗强研究员）
   Biodiversity conservation ecology (PI, Zongqiang Xie)
7. 恢复生态学创新研究组（组长：李凌浩研究员）
   Restoration ecology (PI, Linghao Li)
8. 环境演变与生态模拟创新研究组（组长：倪健研究员）
   Environmental evolution and ecological modeling (PI, Jian Ni)
9. 稳定同位素与生态系统过程创新研究组（组长：林光辉研究员）
   Stable isotope and ecosystem processes (PI, Guanghui Lin)
10. 植物种群生态学创新研究组（组长：王仁忠研究员）
    Plant population ecology (PI, Renzhong Wang)
11. 生态系统响应大气和气候变化创新研究组（组长：万师强研究员）
    Ecosystem responses to atmospheric and climate change (PI, Shiqiang Wan)
12. 植被生态学与植被图志研究组（组长：郭柯研究员）
    Vegetation ecology and Cartography (PI, Ke Guo)


东乌旗草地
Grassland in East Ujumchin


多伦农田
Cropland in Duolun


库布奇沙地
Sandland in Kubuqi


锡林浩特放牧地
Grazingland in Xilinhaote

碳、水交换的联网研究
Network research on C & water exchange

植物生态学研究中心

Research Center for Plant Ecology

张新时院士
Academician Xinshi Zhang

全球变化的实验生态学研究
Global change research in experimental ecology

1	4
2	5
3	6

1. 化学分析实验室
   Chemical Analysis Lab
2. 稳定同位素实验室
   Stable Isotope Lab
3. 环境变迁实验室
   Environmental Evolution Lab
4. 分子生态实验室
   Molecular Ecology Lab
5. 生理生态实验室
   Eco-Physiology Lab
6. 研究生办公室
   Graduate Student Office

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野外台站
Field Stations

全国人大常委会副委员长、中国科学院院长路甬祥视察内蒙草原站
CAS president Yongxiang Lu visited IMGERS

内蒙古鄂尔多斯草地生态系统国家野外科学观测研究站
National Field Station for Grassland Ecosystem in Ordos

IMGERS站区锡林河流域(One Section of Xilin River)

大型蒸发皿 Evaporation Pan

亚高山针叶林 Subalpine Coniferous Forest

植物研究所植物生态学研究中心现有8个野外台站和1个植物园，其中3个国家野外科学观测研究站，4个中国科学院生态系统研究网络（CERN）定位研究站，CERN生物分中心也挂靠在该中心。这些台站的建立为我国重要地区（如我国北方干旱、半干旱区和长江流域）陆地植被/生态系统的长期监测、实验示范和理论研究提供了坚实的基础。以野外台站为依托开展的原创性研究在*Nature*和*Science*等重要国际性刊物发表。

The Institute of Botany now has 8 field research stations including 3 joined in the Chinese Ecosystem Research Network (CERN). The Bio-subcenter of CERN is also affiliated with the institute. Three stations were listed as national field stations in 2005. The foundation of these stations has provided scientists with a strong working platform for long term monitoring, demonstrative experiments, and frontier research in theoretical ecology in important terrestrial ecosystems of China, such as arid and semi-arid northern China and areas along the Yangtze River. Original research results based in these stations have been published in many international journals including *Nature* and *Science*.

1、内蒙古锡林郭勒草原生态系统国家野外科学观测研究站（CERN站）
National Field Station for Grassland Ecosystem in Xilingol, Inner Mongolia, China (CERN Station)
2、内蒙古鄂尔多斯草地生态系统国家野外科学观测研究站（CERN站）
National Field Station for Grassland Ecosystem in Ordos, Inner Mongolia, China (CERN Station)
3、湖北神农架森林生态系统国家野外科学观测研究站
National Field Station for Forest Ecosystem in Shennongjia, Hubei, China
4、中国科学院北京森林生态系统定位研究站（CERN站）
Beijing Forest Ecosystem Research Station (BFERS), CAS (CERN Station)
5、中国科学院植物研究所华西亚高山植物园
Subalpine Botanical Garden of West China (SBGWC), IBCAS
6、中国科学院植物研究所多伦恢复生态学试验示范研究站
Duolun Restoration Ecology Research and Demonstration Station (DRERDS), IBCAS
7、中国科学院植物研究所浑善达克沙地生态研究站
Otindag Sandland Ecological Station (OSES), IBCAS
8、中国科学院植物研究所中国北方林生态系统定位研究站
Chinese Boreal Forest Ecosystem Research Station (CBFERS), IBCAS
9、中国科学院植物研究所东乌珠穆沁草原生态系统管理研究站
East Ujumchin Grassland Ecosystem Research Station (EUGERS), IBCAS
10、中国生态系统研究网络生物分中心
Biological Sub-center of Chinese Ecosystem Research Network (CERN)

苗圃 Nursery

分析实验室 Analysing Lab

野 外 台 站
Field Stations

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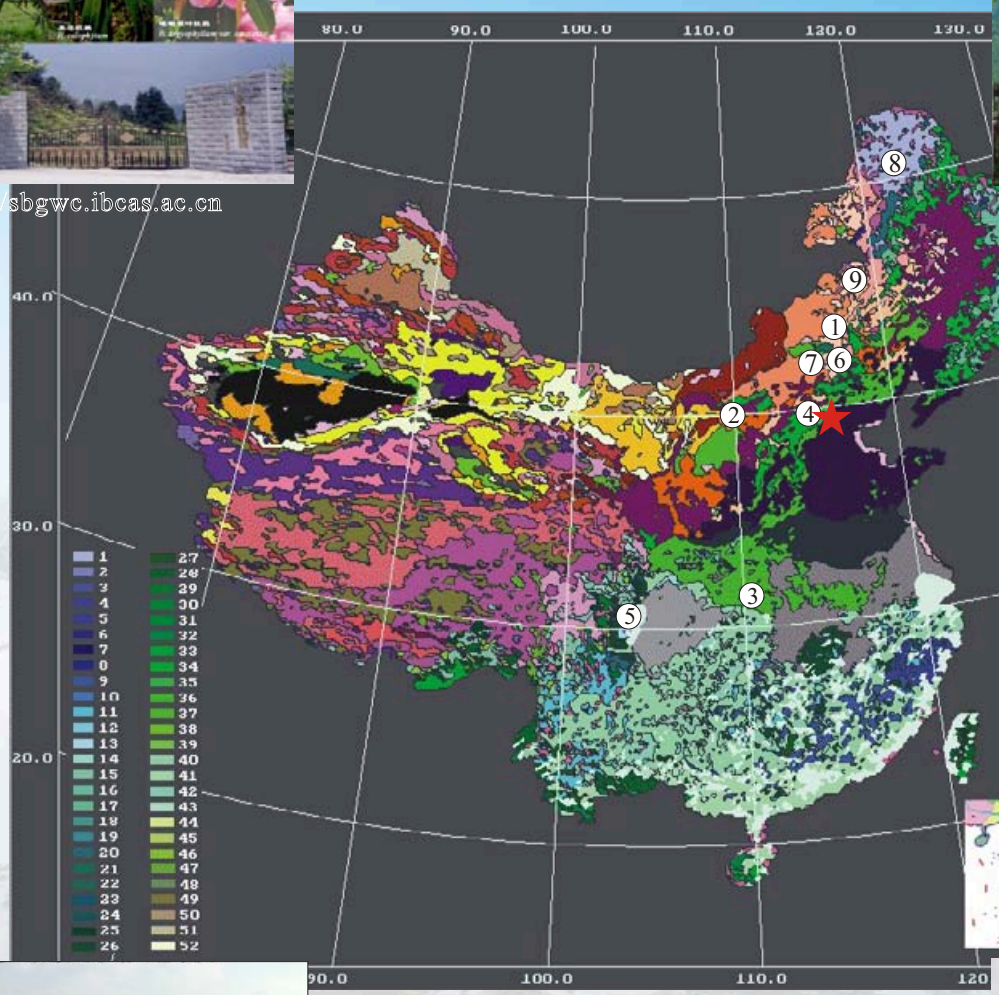
Http://sbrs.ibcas.ac.cn

Http://sbgwc.ibcas.ac.cn

Http://bfers.ibcas.ac.cn



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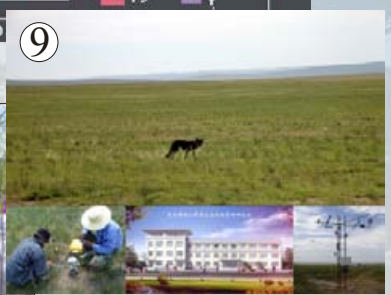

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分子发育生物学研究中心

Research Center for Molecular and Developmental Biology

分子发育生物学研究中心成立于1998年，由原生殖生物学研究室、发育生物学研究室、基因工程研究室和植物化学研究室合并而成。现任主任为林金星研究员。主要研究方向为：植物分子发育生理、植物逆境应答机理与调控技术、植物细胞分化与基因工程。

多年来，利用分子生物学、植物生理学、细胞生物学和蛋白质组学等多种手段，在水稻雄配子发育的蛋白质组学、花粉管发育过程的信号转导、春化作用的分子机理、水稻根系发育、植物对环境信号应答的分子机制、果实的采后生理病理与生物技术、植物次生代谢与调控等研究方面取得了重要进展。

The Research Center for Molecular and Developmental Biology was established in 1998 after merging four departments: the Department of Reproductive Biology, Department of Developmental Biology, Department of Gene Engineering and Department of Phytochemistry in the Institute. The present director is Prof. Jinxing Lin. The main research areas of this center include plant molecular developmental physiology, regulatory mechanism of plant responses to environmental stresses and related techniques, plant cell differentiation and genetic engineering. In the past few years, the center has made substantial progress in the field of proteomics of rice male gametophytes, signal transduction during pollen tube development, molecular mechanism of vernalization in wheat, root morphogenesis in rice, molecular mechanism of plant responses to environmental stresses, post-harvest physiology and biotechnology, plant secondary metabolism and regulation by means of various techniques commonly used in molecular biology, plant physiology, cell biology, and proteomics.

纳升电喷雾串联质谱仪
ESI-Q TOF-MS/MS

激光共聚焦显微镜
Confocal microscope

发育中心目前设有10个创新研究组：

The Research Center for Molecular and Developmental Biology currently consists of 10 research groups:

1. 分子发育生理创新研究组（组长：种康研究员）
   Molecular Developmental Physiology (PI, Kang Chong)
2. 细胞生殖生物学创新研究组（组长：林金星研究员）
   Cell Reproductive Biology. (PI, Jinxing Lin)
3. 采后生理病理学创新研究组（组长：田世平研究员）
   Postharvest Physiology & Pathology (PI, Shiping Tian)
4. 生殖发育功能蛋白质组创新研究组（组长：王台研究员）
   Functional Proteomics for Reproductive Development. (PI, Tai Wang)
5. 植物修复分子生物学创新研究组（组长：麻密研究员）
   Molecular Biology of Phytoremediation (PI, Mi Ma)
6. 生物资源与基因资源创新研究组（组长：刘公社研究员）
   Bio-Germplasm & Gene Resources. (PI, Gongshe Liu)
7. 逆境代谢基因工程创新研究组（组长：马庆虎研究员）
   Plant Stress Metabolism & Biotechnology (PI, Qinghu Ma)
8. 渗透胁迫分子生物学创新研究组（组长：华学军研究员）
   Molecular Biology on Plant Response to Osmotic Stress (PI, Xuejun Hua)
9. 激素信号转导创新研究组（组长：王志勇研究员）
   Hormone Signaling Transduction (PI, Zhiyong Wang)
10. 种子基因工程创新研究组（组长：曲乐庆研究员）
    Seed Gene Expression and Genetic Engineering (PI, Leqing Qu)

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光合作用研究中心
Research Center for Photosynthesis

光合作用研究中心成立于1998年，现有中国科学院院士1人、研究人员28人，现任主任为卢从明研究员。主要研究方向：光合膜蛋白和膜脂的结构与功能、光合作用功能基因组学和蛋白质组学、光合作用对环境适应的分子机理和植物水分养分生物学。

多年来，通过植物生理学、生物化学、生物物理学、分子生物学、功能基因组学和蛋白质组学等多学科的综合交叉研究，探索光合作用功能调控的生理基础和分子机理，在光合膜蛋白结构与功能、光合作用对环境胁迫反应的分子机理、光合膜脂的生物合成与功能、光合作用功能基因组学等研究方面展开了卓有成效的研究，取得了重要进展。

The Research Center for Photosynthesis was established in 1998. Dr. Congming Lu is the director of the Center. The center's major research areas include structure and function of proteins and lipids involved in photosynthetic membranes, functional genomics and proteomics of photosynthesis, molecular mechanisms of photosynthesis adapted to the environment, and plant water and nutrient biology. The key objective of the center is to decipher physiological and molecular mechanisms of photosynthesis by plant physiology, biochemistry, biophysics, molecular biology, functional genomics and proteomics. During the last several years, many achievements have been made in the center in particular in the areas of structure and function of membrane proteins, the molecular mechanisms of photosynthesis in response to environment stresses, and functional genomics of photosynthesis.

光合作用研究中心设有7个创新研究组：
The Research Center for Photosynthesis currently consists of 7 research groups:

1. 光合膜脂的生物合成、结构与功能创新研究组（组长：许亦农研究员）
   Biosynthesis, Structure and Function of Photosynthetic Membrane Lipids (PI, Yinong Xu)
2. 光合作用环境适应分子机理创新研究组（组长：卢从明研究员）
   Molecular Mechanism of Photosynthetic Adaptation to Environment (PI, Congming Lu)
3. 捕光色素蛋白复合体功能调控创新研究组（组长：杨春虹研究员）
   Functional Regulation of Light-Harvesting Complexes (PI, Chunhong Yang)
4. 光合作用功能基因组学创新研究组（组长：张立新研究员）
   Functional Genomics of Photosynthesis (PI, Lixin Zhang)
5. 光合作用功能蛋白质组学创新研究组（组长：黄芳研究员）
   Functional Proteomics of Photosynthesis (PI, Fang Huang)
6. 植物环境信号应答蛋白质组学创新研究组（组长：沈世华研究员）
   Proteomics of Plant Response to Environmental Signals (PI, Shihua Shen)
7. 植物水分养分生物学创新研究组（组长：张文浩研究员）
   Plant Water and Nutrient Biology (PI, Wenhao Zhang)

全国人大常委会副委员长、中国科学院院长路甬祥视察光合作用研究中心实验室

Prof. Yongxiang Lu, Vice Chairman of the Standing Committee of the People's Congress and President of the Chinese Academy of Sciences, visits the laboratories of Photosynthesis Research Center

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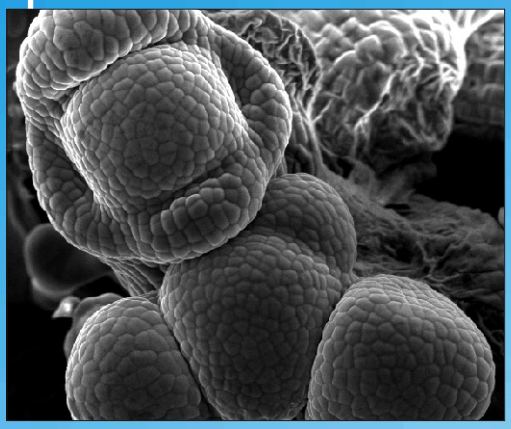
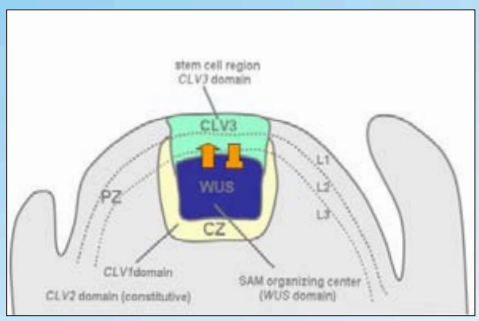
信号转导与代谢组学研究中心

Research Center for Signal Transduction & Metabolomics



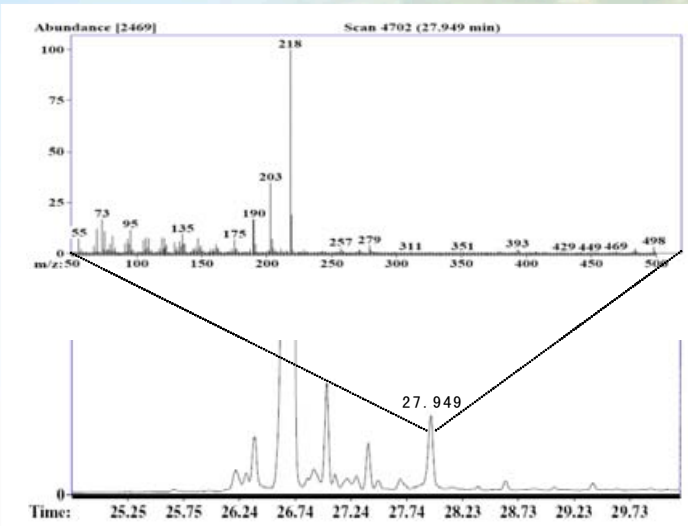
信号转导与代谢组学研究中心（C-STM）成立于2005年，中心主任为刘春明研究员。其宗旨是面向国家农业发展的重大需求，探索小分子化合物在植物发育和抗病过程中的作用，从分子、细胞和代谢物水平上解析包括激素、多肽、代谢物、小RNA等化合物所参与的生物学过程及其信号转导机理，研究霉菌毒素在植物体内的产生及代谢过程，开发小分子功能化合物在农业和人类健康领域中的应用。我们的目的是通过深层次的基础研究和有目的的应用探索相结合，为国家的农业发展和能源需求等领域的可持续性发展做出贡献。

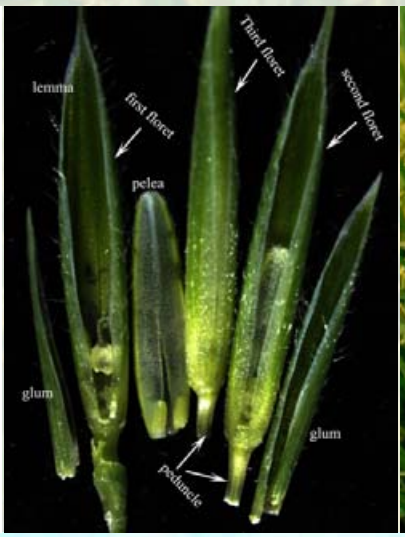


本中心现有五个研究组，75位科研及科研辅助人员。其中研究人员13人，管理人员3人，硕博研究生45人，客座研究人员14人。研究材料包括水稻、拟南芥、短柄草和甜高粱等。我们努力营造一个严谨、开放、自由和合作式的研究环境，从而最大程度上实现智力和资源共享，在相关科研领域加强与国内外大学、研究机构和企业的联系。

The innovative Center for Signal Transduction & Metabolomics (C-STM), chaired by Professor Chun-Ming Liu, was founded in 2005, to strengthen the institute's research in small functional molecules. The aim of the center is to conduct curiosity based research and to solve functional problems encountered in sustainable agricultural development with particular focus on small molecules such as hormones, peptides, metabolites and small RNAs. We use state-of-the-art technologies to dissect the functions of small molecules in plant development and defense responses at the molecular, cellular and metabolite levels. These studies will help us understand how small molecules contribute to plant signal transduction such as the communication between cells and their environment. We believe that understanding these biological processes will facilitate our exploitation in sustainable agricultural development and energy demand.

C-STM has 5 research groups, consisting of 13 researchers, 3 administration and management staff, 45 PhD and MSc students and 14 visiting researchers. The plant materials engaged include rice, *Arabidopsis*, *Brachypodium distachyon* and sweet sorghum. We adapt an internationally compatible management system to create an open and coorperative research atmosphere to allow maximal sharing of intellectual and facility resources. To facilitate sustainable development, C-STM has establish tight links with universities, research institutions and industry.





信号转导与代谢组学研究中心

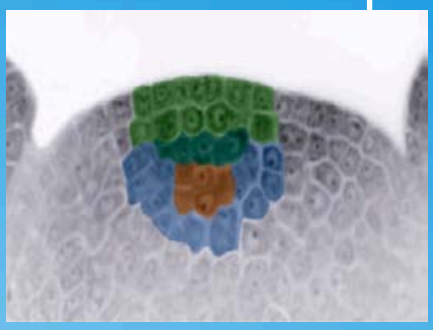
Research Center for Signal Transduction & Metabolomics

胚胎发育与多肽信号转导创新研究组（组长：刘春明研究员）

Embryogenesis and peptide signalling（PI: Chun-Ming Liu)

Fiers M et al. (2006) The CLAVATA3/ESR motif of CLAVATA3 is functionally independent from the non-conserved flanking sequences. ***Plant Physiol*** 141:1284−1292.

Fiers M, Ku KL, Liu CM (2007) CLE peptide ligands and their roles in establishing meristems. ***Curr Opin Plant Biol*** 10:39−43.

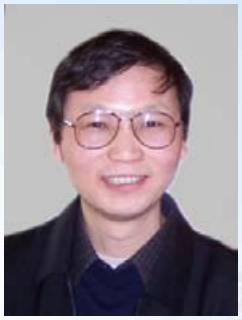


激素信号与生长发育调控创新研究组（组长：胡玉欣研究员）

Plant hormone signaling and developmental control (PI: Yuxin Hu)

Hu Y, Xie Q, Chua NH (2003) The Arabidopsis auxin-inducible gene *ARGOS* controls lateral organ size. ***Plant Cell*** 15:1951−1961.

Hu Y, Poh HM, Chua NH (2006) The Arabidopsis *ARGOS-LIKE* gene regulates cell expansion during organ growth. ***Plant J*** 47:1−9.

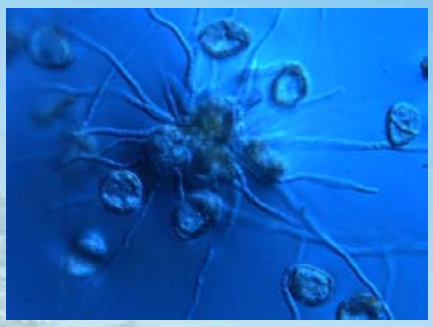


次生代谢及抗病创新研究组（组长：漆小泉研究员）

Plant secondary metabolism and disease resistance (PI: Xiaoquan Qi)

Qi X et al. (2004) A gene cluster for secondary metabolism in oat: Implications for the evolution of metabolic diversity in plants. ***PNAS*** 101:8233−8238.

Qi X et al. (2006) A different function for a member of an ancient and highly conserved cytochrome P450 family: from essential sterol to plant defense. ***PNAS*** 103:18848−18853.

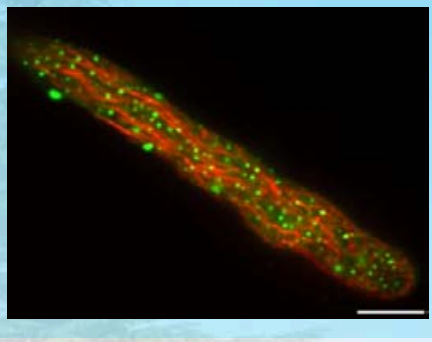


细胞骨架与活细胞功能创新研究组（组长：黄善金研究员）

Cytoskeleton and live cell imaging (PI: Shanjin Huang)

Huang S, Robinson RC, Gao LY, Matsumoto T, Brunet A, Blanchoin L, Staiger CJ (2005) Arabidopsis VILLIN1 generates actin filament cables that are resistant to depolymerization. ***Plant Cell*** 17:486−501.

Huang S, Gao L, Blanchoin L, Staiger CJ (2006) Heterodimeric capping Protein from Arabidopsis is regulated by phosphatidic acid. ***Mol Biol Cell*** 17:1946−1958.



花发育功能基因与环境适应责任研究组（组长：孟征研究员）

Flower development and adaptation environmental (PI: Zheng Meng)

Shan H, Su K, Lu W, Kong H, Chen Z and Meng Z (2006) Conservation and divergence of candidate class B genes in *Akebia trifoliate*. ***Dev Gen Evol*** 216:785−795.

Lu S, Du X, Chong K and Meng Z (2007) Two AGAMOUS-like MADS-box genes from *Taihangia rupestris* reveal independent trajectories in the evolution of class C and class D floral homeotic functions. ***Evol Dev*** 9:92−104.

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光合作用与环境分子生理学重点实验室

Key Laboratory of Photosynthesis and Environmental Molecular Physiology

中国科学院光合作用与环境分子生理学重点实验室成立于2001年12月，由光合作用研究中心、分子发育生物学研究中心和信号转导与代谢组学研究中心组成。主要是利用基因组学、蛋白质组学和代谢组学方法研究光合作用过程中的传能转能机理、植物对环境应答、植物生长发育、信号转导的分子调控及其在农业生物工程上的应用等。实验室成立以来已在*Nature*, *Plant Cell*, *Plant Physiology*, *Plant Journal, Proteomics*等国际著名刊物发表大量论文。在光合膜蛋白复合体结构与功能研究、光合作用对环境适应的机理研究、水稻根系发育功能基因研究、植物干细胞维持、花粉发育囊泡运输、青蒿素生物合成的分子调控等领域做出了一批重要成果。

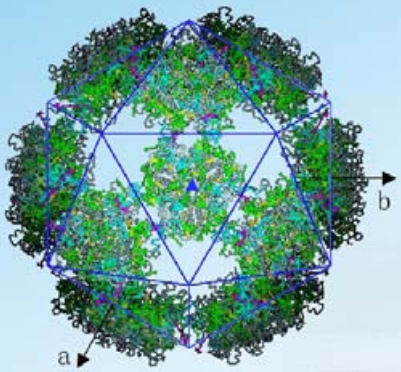
实验室学术委员会主任为匡廷云院士，实验室主任为种康研究员。现有中国科学院院士2位，研究员31位，副研究员6位，支撑人员36位，已形成了一支年龄结构合理、学术水平较高的精干研究队伍。

The Key Laboratory of Photosynthesis and Environmental Molecular Physiology, the Chinese Academy of Sciences, was established in December 2001, which includes the Center for Photosynthesis, Center for Molecular & Developmental Biology, and Center for Signal Transduction & Metabolomics. Prof. Tingyun Kuang, an academician of CAS, heads the academic committee, and Prof. Kang Chong is the Director of the laboratory hiring 73 staff members, including 31 professors (2 academicians of CAS).

Research of the laboratory are focused on understanding the molecular mechanisms of 1) energy conversion process in photosynthesis, 2) plant response to environment and 3) plant metabolism. Progress has been made in deciphering the structure and function of protein complexes of photosynthetic membranes, cloning and function analysis of genes controlling root development, proteomic analysis of pollen and leaf sheath development, mechanisms of photosynthesis adapted to environmental stresses, and molecular regulation on arteannuin biosynthesis. This research has resulted inpublications in international journals such as ***Nature***, ***Plant Cell***, ***Plant Journal***, ***Plant Physiology***, and ***Proteomics***.

近期成果 Achievements

1. 光合能量转换的分子机理
Molecular Mechanisms for Photosynthesis

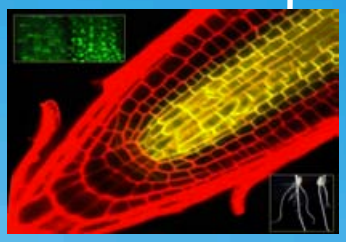


“Crystal structure of spinach major light- harvesting complex at 2.72 A° resolution” was selected as one of “the Ten Great Science and Technology News of China” for 2004 (***Nature***, 2004).

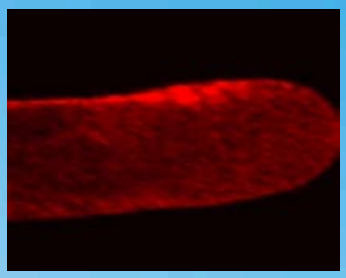
To gain insight into the processes involved in PSII biogenesis, we characterized the *low psii accumulation1* (*lpa1*) mutant of Arabidopsis. In vivo protein labeling experiments showed that the newly synthesized PSII proteins were assembled into functional protein complexes, but the assembly was less efficient in the mutant. *LPA1* encodes a chloroplast protein that contains two tetratricopeptide repeat domains and is an intrinsic membrane protein but not an integral subunit of PSII. Yeast two-hybrid studies revealed that LPA1 interacts with D1 but not with D2, Cyt. b6, or Alb3. Thus, LPA1 appears to be an integral membrane chaperone that is required for efficient PSII assembly, probably through direct interaction with the PSII reaction center protein D1 (***Plant Cell***, 2005).

Genetically engineered tobacco (*Nicotiana tabacum* L.) with the ability to synthesis glycinebetaine was established by introducing the *BADH* gene for betaine aldehyde dehydrogenase. The transgene enabled the plants to accumulate glycinebetaine mainly in chloroplasts, and resulted in enhanced tolerance of growth and CO_2 assimilation to high temperature stress. Under high temperature stress, glycinebetaine maintains the activation of Rubisco by preventing the sequestration of Rubisco activase to the thylakoid membranes from the soluble stroma fractions and thus enhances the tolerance of Co_2 assimilation to high temperature stress. The results seem to suggest that engineering of the biosynthesis of glycinebetaine by transformation with the *BADH* gene might be an effective method for enhancing high temperature tolerance of plants (***Plant Physiol***, 2005).

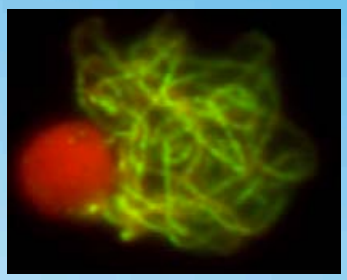
2. 植物发育的基因调控 Gene Regulation for Plant Development



The overexpression of OsAGAP, an ARF-GTPase activating protein (ARF-GAP) in rice, impaired polar auxin transport and interfered with both primary and lateral root development. The lateral root phenotype could be rescued by the membrane-permeable auxin NAA. Our data suggested that OsAGAP has a specific role in regulating vesicle trafficking pathways such as the auxin influx pathway, which in turn controls auxin-dependent root growth in plants (***Plant J***, 2006).

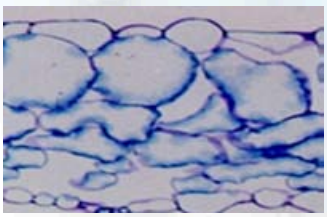


We assessed the effects of brefeldin A (BFA) on pollen tube development in Picea meyeri using fluorescent marker FM4-64 as a membrane-inserted endocytic/recycling marker, together with ultrastructural studies and Fourier transform infrared analysis of cell walls. BFA inhibited pollen germination and pollen tube growth, causing morphological changes in a dosedependent manner, and pollen tube tip growth recovered after transferring into BFA-free medium. These results suggest that enhanced endocytosis, together with inhibited secretion, is responsible for the retarded growth of pollen tubes induced by BFA (***Plant J***, 2006; ***Plant Physiol***, 2006).

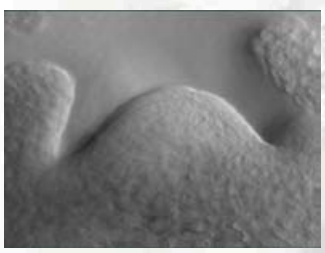


We have identified 4 genes implicated in chromosome cohesion, which is essential to accurate chromosome segregation of meiosis and mitosis. Protein FISH by using of the antibodies against these proteins revealed that OsRAD21-1 and OsRAD21-3 may function in mitotic cohesion and OsRAD21-4 specifically in meiotic cohesion (***Plant Mol Biol***, 2006). Further proteomic analysis of rice mature pollen have identified some novel proteins associated potentially with pollen function (***Proteomics***, 2006).

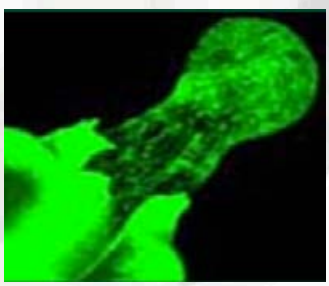
3. 植物信号转导 Signal Transduction in Plants



Molecular basis of plant organ growth: The Arabidopsis *ARL* gene plays an important role in cell expansion during organ growth, thus, regulates the final organ size. Our analysis indicates that ARL partially mediates the brassinosteroid-related cell expansion signal during organogenesis (***Plant J***, 2006).



Peptide ligand and stem cell maintaince: Previous work from Liu and others suggested that CLV3 is involved in controlling the number of stem cells in the shoot apical meristem, but the exact molecular identity remains unknown. The latest research from Liu's group demonstrates that a 14-AA CLE motif located at the C-terminus of CLV3 is the functional cue of the protein. It acts independently from its adjacent sequences (***Plant Physiol***, 2006).



To investigate roles of the actin cytoskeleton in growth of the pollen tube of *Picea meyeri*, we used the actin polymerization inhibitor latrunculin B (LATB) under quantitatively controlled conditions. Actin disruption affected the morphology of Golgi stacks, mitochondria and amyloplasts, along with a differential expression of proteins involved in their functions. These findings provide new insights into the multifaceted mechanism of actin cytoskeleton functions and its interaction with signalling, cell-expansion machinery and energy-providing pathways (***Plant J***, 2006).

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文献与信息管理中心包括图书馆、期刊编辑室和网络信息中心，期刊室编辑出版6种科技期刊，5种学术期刊在我国生物类期刊中始终处于领先地位，并且自创刊以来的所有论文均实行网上开放阅览。其中*Journal of Integrative Plant Biology*和《植物分类学报》已被SCI-E数据库收录。

The Center of Documentation and Information of the CAS consists of a library, six journal editorial offices, and a Center for Bioinformation and Network. Six scientific journals are published by the Center. The five academic journals are among the top rank of the biological journals in China and are open to access. Of the journals published by the Center, the *Journal of Integrative Plant Biology* and *Acta Phytotaxonomica Sinica* have been indexed by SCI-E.

图书馆 Library

图书馆在植物专业图书和期刊等方面的馆藏量居全国之首，馆藏中英文图书资料和研究生论文约3.6万种，6.5万册；中英文期刊约3千种，合订本6.7万卷。书、刊总量已逾30万卷册。图书馆每年入馆中西文期刊1 300余册，图书300余册。并购买Blackwell, Elsevier, Springer等多个生物学科权威电子文献全文数据库。

The library has the richest collection of books and periodicals on plant science in China, with 65 000 copies of 36 000 books and theses, and 3 000 periodicals (67 000 bound volumes) in either Chinese or English. To date, the total collection of the library is more than 300 000 volumes/copies of books and periodicals. In recent years, the library has collected approximately 1 300 copies of periodicals, 300 copies of books of Chinese and foreign languages every year, and some biological databases such as Blackwell, Elsevier and Springer.

◁ 书库
Stack room

▷ 书架
Bookshelves

▽ 现刊阅览室
The journal reading room

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文献与信息管理中心
Center of Documentation and Information

Journal of Integrative Plant Biology 《植物学报》1952年创刊，英文，月刊，是海内外植物学家公认的我国植物学领域最有影响的国际性学术刊物。被SCI-E等国际著名检索系统收录。自2005年，由国际著名的Blackwell Publishing出版。

Journal of Integrative Plant Biology (Formerly *Acta Botanica Sinica*), launched in 1952, has become an international journal on plant sciences. As an official English-language publication and a monthly journal, it is indexed in 44 databases including SCI-E. In January 2005, the journal entered into a co-publishing partnership with Blackwell Publishing.

http://www.jipb.net
http://www.chineseplantscience.com
http://www.blackwell-synergy.com

《植物分类学报》于1951年创办，双月刊，是我国生物学科历史最悠久的核心期刊，代表了我国植物分类学领域的最高学术水平。已被SCI网络版和CC等数据库收录。

Acta Phytotaxonomica Sinica is a bimonthly journal presenting pioneering research papers in the fields of plant taxonomy, phylogeny and evolution. Founded in 1951, and continuing publication of the four Chinese botanical journals before 1949, it is the oldest Chinese journal in the discipline of biology. This journal has been included in some famous databases such as SCIE and CC.

http://www.plantsystematics.com

《植物生态学报》1955年创刊，双月刊，是我国生态学领域创刊最早的专业性学术刊物，全面报道我国植物生态学最新研究成果，及时反映学科发展热点和生长点。该刊论文在纸质版印刷前2个月网上在线刊出。多年来，影响因子位居我国生物类期刊前列。从2007年起与牛津大学出版社合作出版英文版。

Journal of Plant Ecology (Formerly *Acta Phytoecologica Sinica*), founded in 1955, was the oldest academic journal in ecology in China. It has been the top biological journal in China with the impact factor (1.523) based on the Chinese S&T Journal Citation Reports since 2005.

http://www.plant-ecology.com

《生物多样性》1993年创刊，双月刊，是国内唯一报道生物多样性研究成果的综合性学术期刊。被国际农业和生物科学文摘（CAB Abstracts）、美国化学文摘(CA)、俄罗斯文摘杂志(AJ)等重要检索系统收录，影响因子在国内生物学类刊物中位居前5位。

Biodiversity Science (formerly *Chinese Biodiversity*), founded in 1993, is now a bimonthly journal. *Biodiversity Science* has been ranked as one of the leading scientific journals in the field of biology, and is indexed in 14 databases including CA and AJ. According to the Chinese S&T Journal Citation Reports, its impact factor is among the top five Chinese biological journals.

http://www.biodiversity-science.net

《植物学通报》1983年创刊，双月刊，是我国植物学领域的综合性专业学术刊物。期刊的定位是及时、快速和全面地反映我国植物科学研究的最新成果。

Chinese Bulletin of Botany is one of the core journals on plant sciences in China. The Journal mainly publishes original research papers, short communications and reviews in all key areas of modern plant biology representing the advances in plant sciences in China.

http://www.chinbullbotany.com

《生命世界》月刊，自2004年4月由《植物杂志》更名而来，已日渐成为传播生命科学知识、报道生命科学研究信息、引导读者正确认识和思考生命科学热点问题的国内权威媒体。

Life World, a new monthly magazine originated from *Plant* in 2004, has become one of the most popular and authoritative media in China. It introduces general knowledge of life sciences, reports research advancement in life sciences and leads readers to know the hot-spots in life sciences.

http://www.lifeworld.com.cn

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http://journal.ibcas.ac.cn

北京植物园
Beijing Botanical Garden

中国科学院植物研究所北京植物园是我国北方生物多样性和植物种质资源保护及可持续利用研究的重要基地，也是我国植物学科普教育的重要园地。主任为马克平研究员，执行主任为景新明研究员。

在72公顷园区内建有树木园、宿根花卉园、木兰牡丹园、月季园、本草园、裸子植物区、野生果树资源区、环保植物区、水生和藤本植物区、稀有濒危植物区、紫薇园等十余个植物展区和一个热带、亚热带植物展览温室，还有从事植物引种驯化和迁地保护研究、种质资源保存和新品种培育的苗圃、实验地和后台温室，共收集保存植物6000余种（含种下分类单位和栽培品种），在幽静自然的园林美景中向公众展示中国与世界的植物多样性。先后被授予“全国青少年科技教育基地”、“中央国家机关思想教育基地”、“北京市科普教育基地”、“北京青少年科技俱乐部活动学术指导中心”、“海淀科普教育基地”、“全国林业科普基地”等称号。

The Beijing Botanical Garden of the Institute of Botany, CAS, was founded in 1955. It is an important base for conservation of biodiversity and plant germplasm and for their sustainable use in northern China. It is also one of the major sites for disseminating knowledge on botany. The director is Professor Keping Ma, and the executive director is Professor Xinming Jing.

The Beijing Botanical Garden covers an area of 72 hm^2 with 20.7 hm^2 of display areas. Among the display areas are the Arboretum, the Perennial Garden, the Rose Garden, the Magnolia and Peony Garden, the Medicinal Herb Garden, the Gymnosperm Section, the Wild Fruit Tree Resources Section, the Environment-Protection Plants Section, the Aquatic and Climbing Plants Garden, the Rare and Endangered Plants Section, the Crape Myrtle Garden, and the Tropical and Subtropical Plant Houses. The Botanical Garden has a collection of nearly 6000 plant species and varieties from home and abroad, which is one of the largest site for *ex situ* conservation among the botanical gardens in China. Owing to the great achievement in investigation and public education on biodiversity conservation and sustainable utilization of wild plant resources, the Beijing Botanical Garden has been awarded numerous titles in recent years by the government, such as "National Science and Technology Education Center for Teenagers," "National Ideology Education Base," "Public Education Base of Beijing City," "Public Education center of Haidian District," and "National Forestry Public Education Base."

目前，植物园设有4个创新（责任）研究组

The Beijing Botanical Garden currently consists of 4 research groups:

1、濒危及野生植物迁地保育的基础生物学理论与技术创新研究组（组长：李振宇研究员）
Ex situ conservation and sustainable utilization of plant germplasm (PI, Zhenyu Li)

2、果树生理与遗传规律创新研究组（组长：李绍华研究员）
Physiology and genetics of fruit trees (PI, Shaohua Li)

3、种子生物学创新研究组（组长：宋松泉研究员）
Seed Biology (PI, Songquan Song)

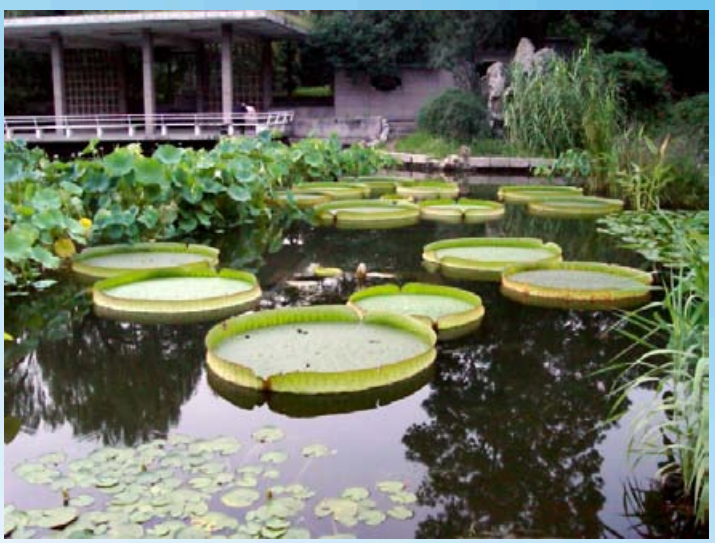
4、花卉生理与遗传育种责任研究组（组长：王亮生副研究员）
Flower physiology and breeding (PI, Liangsheng Wang)

北京植物园
Beijing Botanical Garden

宿根花卉园 The Perennial Garden

牡丹园 The Peony Garden

紫薇园 The Crape Myrtle Garden



水生植物区 The Aquatic Plants Garden

本草园 The Medicinal Herb Garden

裸子植物区 The Gymnosperm Section

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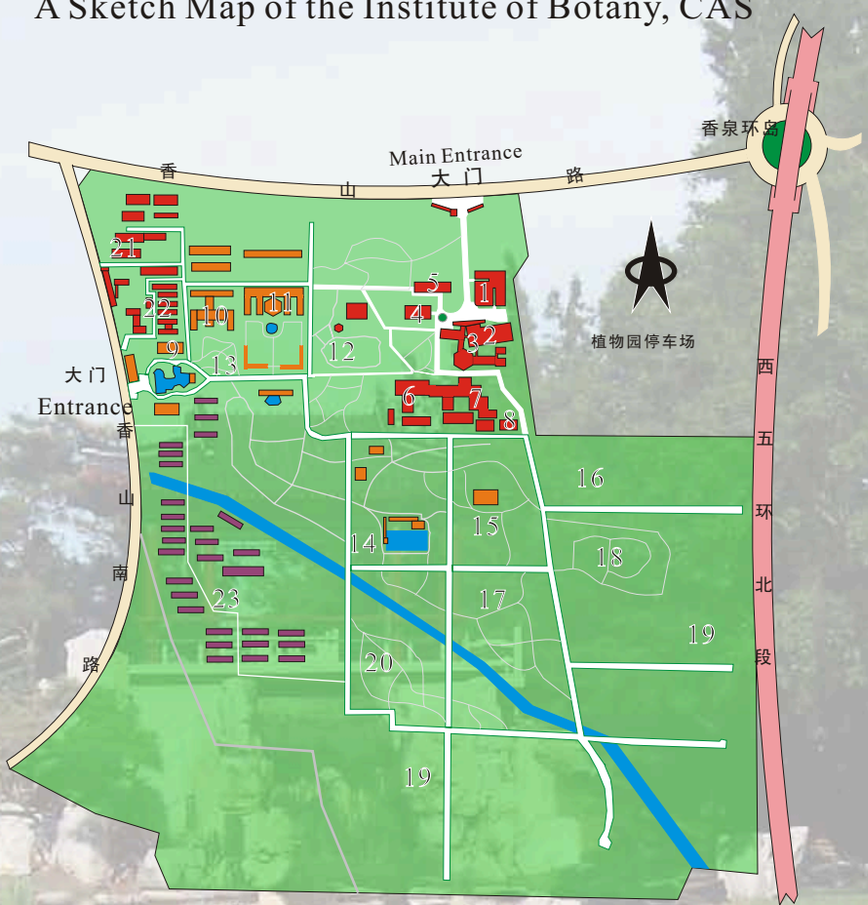
中国科学院植物研究所园区示意图

A Sketch Map of the Institute of Botany, CAS



1. 图书综合楼
2. 植物标本馆
3. 系统中心
4. 生态中心
5. 植物园办公楼
6. 发育中心
7. 光合中心
8. 中国古植物馆
9. 植物园科普中心
10. 实验温室区
11. 展览温室与月季园
12. 宿根花卉园
13. 牡丹芍药园
14. 水生与藤本植物区
15. 紫薇园
16. 珍稀濒危植物区
17. 树木园
18. 本草园
19. 试验区
20. 果树资源区
21. 西北门
22. 招待所
23. 生活区

1. Building of Administration and Library
2. Herbarium(PE)
3. Research Center for Systematic and Evolutionary Botany
4. Research Center for Plant Ecology and Biodiversity Conservation
5. Building of Botanical Garden
6. Research Center for Molecular and Developmental Biology
7. Research Center for Plant Photosynthesis
8. National Museum of Plant History of China
9. Public Education Building
10. Experimental Greenhouses
11. Exhibition Greenhouses and Rose Garden
12. Perennial Plants Garden
13. Magnolia and Peony Garden
14. Aquatic and Climbing Plants Garden
15. Crape Myrtle Garden
16. Rare and Endangered Plants
17. Arboretum
18. Medicinal Herb Garden
19. Experimental Area
20. Wild Fruit Tree Collections
21. Northwest Gate
22. Guest House
23. Residential Quarter

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