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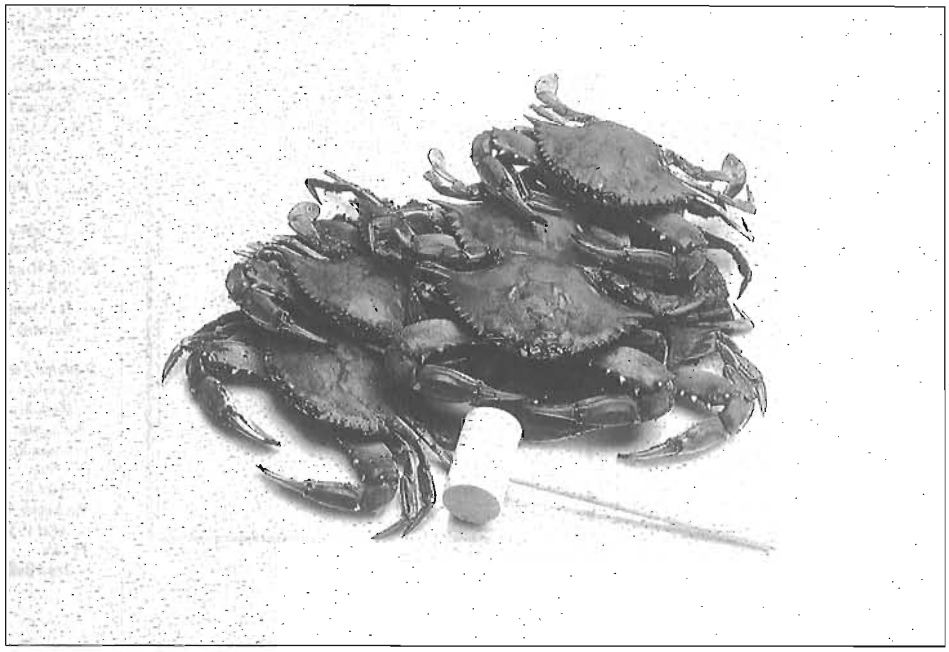
ASPP NEWS

Plant Biology '99



Plant Labs Grab Crabs: Chesapeake Bay Crabs Await You at Plant Biology '99! Photo courtesy of Baltimore Area Convention & Visitors Association.

Join your colleagues in celebrating ASPP's 75th Anniversary at Plant Biology '99 in Baltimore, Maryland, on July 24–28!

ASPP's 75th Anniversary Meeting Events:

Special President's Symposium
Banquet Honoring Past Officers, Award Winners, & ASPP Traditions

Chesapeake Bay Crab & Chicken Feast

ASPP Family Tree

Extended Poster Sessions

SYMPOSIA

Auxin Biology
Organizers: Mark Estelle and Ottaline Leyser
Cell Cycle Regulation
Organizer: Tom Jacobs
Functional Plant Genomics
Organizer: Jeff Bennetzen
Biochemical Genetics
Organizer: Dean Della Penna
President's Symposium: Global Issues in Plant Biology
Organizer: Brian Larkins
Speakers: Peter Raven, Lester Brown, and Robert Fraley

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▼ Novartis, UC–Berkeley Plant Scientists Reach $25 Million Research Collaboration
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Deadline for March/April 1999 *ASPP NEWS*: February 10, 1999

Future ASPP Annual Meetings

1999
Saturday, July 24, through Wednesday, July 28
Baltimore, Maryland
ASPP's 75th anniversary meeting

2000
Saturday, July 15, through Wednesday, July 19
San Diego, California

ASPP NEWS

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ASPP-Sponsored Workshop in Greece

ASPP will be cosponsoring a workshop in Greece in collaboration with the Mediterranean Agronomic Institute of Chania (MAICh). The goal of the workshop is to foster collaborations in research and training between ASPP scientists and scientists from countries with newly established or developing programs in plant biology.

The workshop, entitled "Plant Sciences: Perspectives Beyond 2000," will be held in Chania, an old port city on the island of Crete from July 5 through July 16, 1999. MAICh will provide classroom, laboratory, lodging, and food facilities to participants. MAICh is one of the four centers that make up the International Center for Advanced Mediterranean Agronomic Studies (CIHEAM). Established in 1962 under the auspices of the Council of Europe and the Organization for Economic Cooperation and Development (OECD), CIHEAM is today an intergovernmental organization of 13 countries: Albania, Algeria, Egypt, France, Greece, Italy, Lebanon, Malta, Morocco, Portugal, Spain, Tunisia, and Turkey. The Food and Agricultural Organization (FAO) and the European Commission also support the activities of CIHEAM.

The two-week workshop will involve lectures and laboratory sessions and provide time for small-group interactions. Professor Kriton K. Hatzios, of the Virginia Polytechnic Institute and State University, is the U.S. coordinator for the workshop. Dr. Andreas Doulis, coordinator of studies at MAICh, is the Greek coordinator. As of today, the following ASPP members have agreed to participate as teachers in this workshop: Carole Cramer, Virginia Tech University, Richard Cyr, Penn State University, Richard Dixon, Noble Foundation, Elizabeth Grabau, Virginia Tech University, Eva Pell, Penn State University, Ilya Raskin, Rutgers University, Athanasios Theologis, USDA Plant Gene Expression Center, and Kriton Hatzios, Virginia Tech University. The Greek and other European teachers will be selected in February. Student participants will be selected from Mediterranean and Balkan countries with newly established programs in plant biology.

For more information, contact Andreas Doulis (adoulis@maich.gr) in Greece or Kriton Hatzios (hatzios@vt.edu) in the United States. A Web site with more information about this workshop is available at http://www.ppws.vt.edu.

Deb Weiner Leaves *Plant Physiology*

Deborah I. Weiner, managing editor of *Plant Physiology,* leaves ASPP February 20th, after more than seven years' association with the journal and the Society.

Former executive director Mel Josephs and former publications director Jody Carlson hired Deb in December 1991 and charged her with bringing all editorial and peer-review functions in house. She and newly appointed editor-in-chief Maarten Chrispeels joined forces in January 1992 to begin to plan for the transition to his editorship. Deb felt from the start that their partnership would be a successful blending of her editorial capabilities and Dr. Chrispeel's scientific vision: "We both quickly developed our respective areas of management for the journal. I learned a great deal from Maarten and am grateful for his support and strong leadership."

Within a short time, Deb redesigned the interior of the venerable journal, instituted full-color covers, set up an in-house peer-review and manuscript-processing unit in collaboration with existing staff, enforced a system that reduced the turnaround time from submission of manuscript to publication to six months, and helped convince the Society to create an additional editorial staff position dedicated to *Plant Physiology*. "I felt very challenged," she said recently. "I'm proud that all of those challenges have been met and that *Plant Physiology* is such a successful journal."

Deb is well known in the scientific community, having enjoyed excellent communications with probably thousands of authors and reviewers, as well as the *Plant Physiology* editorial board members—more than 100 prominent scientists—over the years. "I leave with great respect for the board's commitment and hard work, and great affection for many of the scientists I have had the privilege to work with."

The feelings are mutual. *Plant Physiology* associate editor John Browse adds, "Deb's professional competence and attention to detail, as well as her personal friendliness and willingness to help, have been the hallmarks of her tenure as editor. We have all enjoyed working with her immensely and wish her the very best in her new position."

Deb has also seen the headquarters operation grow enormously in the past seven years and warmly acknowledges her colleagues' dedication.

She leaves the Society to join Georgetown University Press, where she will assume the position of editorial and production manager. In 1998, the highly regarded press published 27 books in the areas of politics, international affairs, language and linguistics, religion, and ethics. It is actively positioning itself for strong growth over the next five years.

A search for Deb's replacement at ASPP is currently under way.

Deborah Weiner, managing editor of *Plant Physiology.*

NSF's $85 Million in Awards Advances Plant Genome Research

The National Science Foundation (NSF) announced 23 plant genome research awards totaling $85 million over the next five years beginning in fiscal year 1998. A number of ASPP members were among those receiving awards.

The awards will fund research that contributes to a better understanding at the genome level of the inner workings of all plants, including economically important crops like maize (corn), soybean, tomato, and cotton, an NSF news release reported.

"These awards from the first year of the NSF plant genome research program represent a wide spectrum of activities ranging from pilot technique development projects to comprehensive, interdisciplinary, multi-institutional virtual centers," says Mary Clutter, NSF associate director, Directorate for Biological Sciences. "Future results from these awards are expected to provide the fundamental knowledge and new technologies essential for the advancement of plant biology as well as crop improvement. Novel, value-added, plant-based products will be the likely result. Outcomes of these grants will be exploited by the agricultural sector and other plant-based industries in developing improved plants of economic value."

ASPP member Thea Wilkins, of the University of California, Davis, will study the genome of the world's leading natural fiber, cotton. Cotton is a major contributor to the U.S. and global economies, providing about 55 percent of the fiber used in textile manufacturing. Wilkins and collaborators will investigate certain cotton genes that impart unique, economically important properties to the fiber. "Enhanced understanding of this complex trait holds great promise for the genetic improvement of cotton," Wilkins stated.

The tomato is another economically important crop being studied by scientists funded through this NSF program. ASPP member Steven Tanksley, of Cornell University, and his collaborators will investigate how genes control the development and ripening of tomatoes, as well as the plants' responses to infection.

Genes often work together when plants develop tolerance for environmental stresses. Grantee and ASPP member Nina Fedoroff, of Penn State University, will attempt to identify groups of genes whose patterns change when a plant is environmentally stressed. She will use ozone and pathogen attack as experimental stressors in mustard plants. Her research involves development of a new technology called a DNA microarray detection system. This system, it is hoped, will eventually be used by researchers throughout the field of plant genome biology.

The NSF Plant Genome Research Program is the initial phase of an interagency National Plant Genome Research Initiative recommended in May 1997 by the White House Office of Science and Technology Policy. The plant genome funds were proposed by Senator Christopher Bond (R-MO), who succeeded in gaining approval by Congress of a combined total of $90 million for plant genome research over fiscal years 1998 and 1999.

Following is a list of grantees:

Bohnert, Hans J., University of Arizona, Purdue University (subaward), Oklahoma State University (subaward); Genomics of Plant Stress Tolerance; $8,270,704; four years.

Cande, W. Zacheus, University of California, Berkeley; An Integrated Map of Cytological, Genetic and Physical Information of Maize; $762,977; four years.

Coe, Edward H., University of Missouri, University of Georgia (subaward), Clemson University (subaward); Comprehensive Genetic, Physical, and Database Resource for Maize; $11,075,485; five years.

Cook, Douglas, Texas A&M University, University of Georgia (subaward), University of Minnesota (subaward); Medicago Truncatula as the Nodal Species for Comparative and Functional Legume Genomics; $3,440,561; three years.

Delmer, Deborah P., University of California, Davis, Texas Tech University (subaward); Comparative Functional Genomics of the ceIA Gene Family in Plants; $819,818; three years.

Doebley, John F., University of Minnesota, North Carolina State University (subaward), University of California, Irvine (subaward); Evolutionary Genomics of Maize; $5,847,106; five years.

Dooner, Hugo K., Rutgers University; Use of the Transposon AC as a Gene-Searching Engine in the Maize Genome; $1,334,173; three years.

Fedoroff, Nina V., Pennsylvania State University; New DNA Microarray Detection Techniques in the Study of Stress-Induced Changes in Plant Gene Expression; $1,801,988; three years.

Green, Pamela J., Michigan State University, Carnegie Institution of Washington (subaward), Stanford University (subaward), Yale University (subaward), University of Wisconsin (subaward); A Functional Analysis of the Arabidopsis Genome via Gene Disruption and Global Gene Expression Analysis; $8,700,000; three years.

Lam, Eric, Rutgers University; Chromatic Charting: Organization and Dynamics of Plant Nuclear DNA in situ; $676,234; two years.

Lemieux, Bertrand, University of Delaware, University of Illinois–Urbana (subaward), Massachusetts General Hospital (subaward); Genomic Analysis of Seed Quality Traits in Corn; $2,197,783; three years.

Lightfoot, David A., Southern Illinois University, Texas A&M University (subaward); Integrative Physical Mapping of the Soybean Genome; $1,303,664; three years.

Martienssen, Robert, Cold Spring Harbor Laboratory, University of California, Berkeley (subaward); Center for Comparative Genomics in Model and Crop Plants; $1,842,208; three years.

Phillips, Ronald L., University of Minnesota; A Radiation Hybrid and Cloning System for the Genetic and Physical Mapping of the Corn Genome; $1,830,669; three years.

Pratt, Lee, University of Georgia, Cornell University (subaward), Clemson University (subaward); Cross-Linked Sorghum and Rice Physical Maps as a Foundation for Analyzing Genome Structure, Function, and Variation in C4 Grasses; $3,247,755; three years.

Preuss, Daphne K., University of Chicago, Texas A&M University (subaward); Plant Centromere Functions Defined by Tetrad Analysis and Artificial Chromosomes; $2,274,211; five years.

Sung, Z. Renee, University of California, Berkeley; Repackaging the Corn Genome for Molecular Mapping; $301,072; two years.

Tanksley, Steven D., Cornell University, Boyce Thompson Institute (subaward), Texas A&M University (subaward); Development of Tools for Tomato Functional Genomics:

Application to Analysis of Fruit Development, Responses to Pathogens, and Genome Synteny with Arabidopsis; $4,648,484; three years.

Venter, Craig, The Institute of Genomic Research; Generation of a Tomato EST Database; $3,246,725; three years.

Vodkin, Lila O., University of Illinois–Urbar a, Iowa State University (subaward), University of Missouri (subaward), University of Minnesota (subaward), Northern Arizona University (subaward); A Functional Genomics Program for Soybean; $4,460,359; four years.

Walbot, Virginia, Stanford University, University of Arizona (subaward), University of California, Berkeley (subaward), University of California, San Diego (subaward), University of Illinois–Urbana (subaward), Iowa State University (subaward); Maize Gene Discovery, Sequencing, and Phenotypic Analysis; $12,548,370; five years.

Wilkins, Thea A., University of California, Davis, University of Georgia (subaward), Texas Tech University (subaward), Iowa State University (subaward), Clemson University (subaward); Structure and Function of the Cotton Genome: An Integrated Analysis of the Genetics, Development and Evolution of the Cotton Fiber; $3,800,001; three years.

Wing, Rod A., Clemson University; A BAC Library Resource for Crop Genomics; $616,521; five years.

$50 Million NSF Plant Genome Program Will Include $20 Million for New Awards

The National Science Foundation will award some $20 million in new plant genome research awards in fiscal year 1999 as part of the second year of the $50 million plant genome research program. Projects will be supported at award levels ranging up to $3 million per year for one to five years. The remainder of the $50 million this year will go to continuing multiyear grants for plant genome research awarded initially in FY98.

Full proposals must be submitted to NSF by January 29, 1999. NSF encourages applicants to submit letters of intent by December 4, 1998, before submitting a full proposal. The NSF request for proposal was sent by e-mail to ASPP members on the ASPP Campus Contact network when it was first issued.

The Plant Genome Research Program supports projects that make significant contributions to the understanding of plant genome structure and function. Emphasis is placed on plants of economic importance and appropriate model systems that link genome information to function at the cellular, organismal, or evolutionary levels. High-throughput, genome-wide approaches to plant genome research that build on recent advances in genomics, bioinformatics, and plant biology are strongly encouraged in this program. Proposals that deal with individual genes or gene families should be sent to other programs in the NSF Directorate for Biological Sciences.

It is anticipated that most projects will involve multiple investigators, including those from disciplines outside biology. Many projects will also involve multi-institutional networks organized as "virtual centers" or "centers without walls."

Applicants should also consider providing an ideal environment for training young scientists in modern research technologies. All proposals are expected to integrate research and education and must include a well-designed plan to increase participation of members of underrepresented groups.

When applicable, proposed research activities should be coordinated with international networks of research scientists. Innovative collaborations with industry are encouraged.

The Plant Genome Research Program was initiated by Senator Christopher Bond (R-MO), who secured approval by Congress of $40 million in new funds for plant genome research in FY98. The president's budget for FY99 included $40 million for plant genome research. Bond succeeded in gaining an increase of $10 million for a total of $50 million in FY99.

ASPP Campus Contacts and growers of corn and other crops supported Senator Bond's Plant Genome Research Initiative. ASPP members were particularly active in seeking new funds for plant genome research instead of using existing biology research funds for corn genome research.

1999 Awards Committees

Following is a list of the membership of the ASPP awards committees for 1999, as announced by President Brian Larkins:

CORRESPONDING MEMBERSHIP (4-YEAR TERMS)
- L. Anderson (99), chair
- N. Baker (00)
- L. Griffing (01)
- R. Chollet (02)

CHARLES REID BARNES LIFE MEMBERSHIP
- L. Anderson (99), chair
- K. Cline (00)
- R. Bressan (01)
- N. P. Jacobs (99), past winner

STEPHEN HALES PRIZE
- J. Key (99), chair
- C. West (01)
- M. Walker-Simmons (03)
- H. Kende (00), past winner

CHARLES F. KETTERING AWARD
- R. Malkin (99), chair
- D. Bryant (01)
- S. Theg (03)
- B. Buchanan (00), past winner

CHARLES ALBERT SHULL AWARD
- W. Silk (00), chair
- J. Whitmarsh (02)
- J. Mullet (04)
- J. Schroeder (99), past winner

MARTIN GIBBS MEDAL
- K. Keegstra (00), chair
- H. Sze (02)
- S. Wessler (04)
- W. Lucas (99), past winner

ADOLPH E. GUDE, JR., AWARD
- M. Evans (00), chair
- H. Grimes (03)
- D. Delmer (06)
- M. Dilworth (01), past winner

DENNIS R. HOAGLAND AWARD
- L. Rappaport (03), chair
- R. Boston (99)
- T. Sharkey (05)
- B. Larkins (00), past winner

EXCELLENCE IN TEACHING AWARD
- M. Brodl (02), chair
- D. Dalton (99)
- J. Cheeseman (05)
- C. Reiss (01), past winner

$4 Million Rice Genome Research RFP Expected from USDA, NSF, DOE

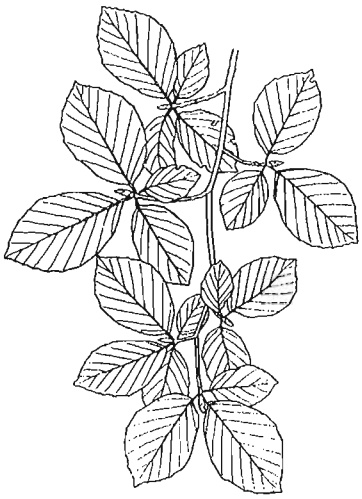
Some $2 million of the $4 million increase for the plant systems category of the USDA National Research Initiative is expected to go for rice genome research in fiscal year 1999. Another $2 million is expected to be provided by the National Science Foundation for this joint-agency request for proposal (RFP). The Department of Energy is cooperating with this joint-agency effort and may provide a smaller amount of funds for rice genome research.

It is expected that $4 million would go to rice genome research in FY2000 and FY2001 if funds are available, making this a three-year, $12 million effort. The $4 million rice genome research program would come at a time when there is an international rice genome sequencing effort.

Some observers have pointed to a need for increased U.S. investment in rice genome research. In January 1998, a U.S. interagency committee recommended that the United States contribute $40 million and sequence 20% of the rice genome over the next five years. Rice genome research was not funded in the FY98 NSF Plant Genome Research Program.

Science reported in an October 23, 1998, article titled "Slow Start for U.S. Rice Genome Project" that thus far, only Japan has put substantial money behind the rice genome effort. Although France seems eager to support some work, the European Union will not consider substantial support for sequencing the rice genome for a year, and it is not certain a commitment will be made at that time. Japan began its sequencing program in April and could lose interest in an open-data policy if no one else is contributing, the article said.

The expected joint-agency RFP will likely be published in January. The RFP will be sent by e-mail to ASPP Campus Contacts and will be posted on the ASPP homepage at http://aspp.org.



NSF, USDA, DOE Expect to See Complete Genome Sequence of Arabidopsis by Year 2000 with Renewal of Grants

The National Science Foundation (NSF), the Department of Energy (DOE), and the Department of Agriculture (USDA), have funded two groups of researchers through renewal grants to continue systematic large-scale genome sequencing of *Arabidopsis thaliana.*

The ultimate goal is to sequence the entire Arabidopsis genome and to determine the structure and function of every gene in this model plant by the end of 2000. The combined three-year awards total $28.3 million.

An NSF news release noted that *Arabidopsis thaliana* is a small plant in the mustard family and has the smallest genome and the highest gene density so far identified in a flowering plant. What scientists learn from the study of Arabidopsis will be immediately applicable to economically important plant species, according to Mary Clutter, NSF associate director, Directorate for Biological Sciences, and will lead to the creation of new and improved plants and plant-based products. "Because plants are vital to our existence, increased understanding of the biology of plants will impact every facet of our lives, from agriculture, to energy, to the environment, to health," says Clutter.

In 1990, the Multinational Coordinated *Arabidopsis thaliana* Genome Research Project was launched by an international group of scientists who recognized the need to examine in detail one simple plant with basic features common to all plants. "During the past several years, Arabidopsis has become established worldwide as the species of choice for molecular genetic studies of plant biology," says Clutter.

Martha Krebs, director of DOE's Office of Science (formerly the Office of Energy Research), noted that Arabidopsis genome efforts have provided numerous scientific insights, as well as potential commercial uses of interest to the energy community, including the high-volume production of plastics. "Completion of the Arabidopsis genome sequencing project will help advance long-range research efforts toward engineering green plants for energy capture, production of energy-rich fuels and materials, and facilitating environmental remediation," Krebs predicts.

USDA Deputy Undersecretary Eileen Kennedy said, "Completing the sequencing for the model plant Arabidopsis is the key to unlocking what comes after. It will help scientists understand the basis for resistance to disease and pests in agriculturally important crops."

The two groups of researchers selected for the current research grants are The Institute for Genomic Research in Rockville, Maryland, and a consortium of Stanford University, the University of Pennsylvania, and the University of California, Berkeley. The two groups are part of the international consortium AGI (Arabidopsis Genome Initiative) that includes an additional U.S. group at Cold Spring Harbor Laboratory on Long Island, New York, two groups in Europe, and a group in Japan.

"Activities will be coordinated to maximize efficiency and usefulness," says Clutter, "and information from the project will be widely disseminated so that researchers will gain maximum benefits." Increased NSF support for Arabidopsis genome research was made possible through the National Plant Genome Initiative sponsored by Senator Christopher Bond (R-MO).

Novartis, UC–Berkeley Plant Scientists Agree on $25 Million Research Collaboration

ASPP Members Negotiate Pact

The Department of Plant and Microbial Biology, in the College of Natural Resources at the University of California, Berkeley, will receive $25 million in research funding over five years in a research agreement with the Novartis Agricultural Discovery Institute. Professor and department chair Bob Buchanan, a past president of ASPP, and Wilhelm Gruissem, past department chair and an ASPP member, helped in reaching this significant collaboration agreement with Novartis Agricultural Discovery Institute, Inc., and its president, Steven P. Briggs, also a member of ASPP.

The following information from a UC–Berkeley news release (November 23, 1998) on the landmark agreement provides details of the pact. The funding will support basic research in the department in the area of agricultural genomics. It will also provide access to proprietary technology and DNA databases, which UC–Berkeley said will significantly enhance the university's ability to do research at the forefront of plant genomics.

In return, Novartis scientists will work closely with UC–Berkeley researchers, and the company will receive first rights to negotiate for a fraction—roughly 30–40 percent—of the discoveries made in the department. The fraction corresponds approximately to the proportion of the department's total research budget provided by Novartis and will vary from year to year.

Novartis will pay patent costs, license fees, royalties, and all other costs normally associated with the commercialization of research, but the university will own the patents and collect royalties on their use.

"This is the first, though experimental, step in what we hope will be a long and fruitful relationship," said UC–Berkeley Chancellor Robert M. Berdahl. "Novartis brings significant intellectual assets as well as financial support to an important area of fundamental research." Berdahl emphasized that the agreement is an "experimental alliance" that will be monitored closely by the campus administration during its five-year course.

Peggy Lemaux, of the Department of Plant and Microbial Biology and a member of the ASPP Committee on Public Affairs, said that the agreement offers students exposure to state-of-the-art information and technologies relating to genomics. Having a partner like Novartis gives students a different starting point for their projects, thereby allowing them to make more progress toward their ultimate goal of understanding functions of genes.

"This alliance will enable us to exchange knowledge, share our resources, and facilitate the application of academic science to social well-being," said Briggs. "Novartis wants to develop a joint vision with the Plant and Microbial Biology faculty to identify goals and work toward their achievement."

Novartis, a Swiss-based life sciences company with significant interests in California, is a world leader in biotechnology research and invests more than $2.5 billion in research and development annually. Through an independent charitable foundation called the Novartis Research Foundation, the company announced in 1998 a $600 million investment worldwide over the next 10 years in plant genomics, one of the largest research initiatives ever undertaken in plant biotechnology. The first step was the creation of the Novartis Agricultural Discovery Institute, whose main campus will be in San Diego.

Two years ago the College of Natural Resources set out to design a new approach to research collaborations with the private sector to augment the individual agreements faculty currently enter into with private companies, which generally target a particular research application. The goal was not simply to raise funds to support research, but to identify a private-sector partner who would make a significant intellectual contribution to the university and support research in the public interest.

The department solicited proposals for research collaborations from six companies, of which four responded. Novartis's proposal stood out from the others because of the company's interest in safeguarding academic freedom, according to the university. (See related article in box on page 9.)

"We made it quite clear that the culture and values of the university must be paramount," said Gordon Rausser, dean of the College of Natural Resources. "This is a valuable experiment, and we'll be monitoring it very closely to ensure that it produces synergies that enrich public interest research."

Among the safeguards is a six-member advisory committee to oversee the contract, made up of three UC–Berkeley representatives and three Novartis representatives, as well as a five-member research committee to award the grants. The research committee will include three UC–Berkeley faculty. "Together these committees will monitor the university's and the public's interests and preserve an open research environment at UC–Berkeley," said Joseph Cerny, vice chancellor for research at the university. In addition, the agreement allows either partner to cancel the contract with a year's notice.

Bob Buchanan, professor and department chair, Department of Plant and Microbial Biology, College of Natural Resources, University of California, Berkeley.

Steven Briggs, president, Novartis Agricultural Discovery Institute, Inc.

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Under the agreement, Novartis will provide the department with $5 million a year for five years, to be awarded by the research committee. The funds will have no restrictions on their use and will go solely for non-targeted basic research in plant genomics.

Novartis, in turn, will have first rights to license a fraction of the research developments in the department, whether sponsored by Novartis or by certain state or federal agencies like the National Institutes of Health that allow such arrangements. The fraction will be determined by the proportion of departmental research that Novartis funds, a method of calculation recommended by National Institutes of Health guidelines regarding agreements like this.

Nevertheless, all developments will be patented by the University of California, and the university will receive royalties from the license. The agreement conforms to all University of California policies.

A primary goal of the department and Novartis Agricultural Discovery Institute will be to match plant genes with plant traits, such as the genes that control resistance to disease, development of the seed, or response to light. To facilitate this research, Novartis will provide access to patented, proprietary databases that include genetic information on crop plants; the bacteria, viruses, and insects that attack them; and harmful as well as beneficial soil microbes. These resources range from gene sequences to information on metabolic pathways in plants. Novartis also will supply gene chips and other tools to help researchers assign a gene's role in the natural history of an organism.

"This agreement gives the department access to important cutting-edge research capabilities, resources, and technologies that will allow us to push out the frontiers in this fast-changing field of knowledge," Buchanan said. "This is a unique opportunity to facilitate cutting-edge research while enhancing training and teaching."

Despite the proprietary nature of the information and technology, Novartis recognizes that the open academic environment at UC–Berkeley and the fact that it is a public institution make it impossible to assure the confidentiality of such information. As for publishing scientific results, Novartis will receive a manuscript 30 days before submission to review the findings. If Novartis elects to authorize UC–Berkeley to patent the findings, an additional delay of up to 90 days may be granted. Publication preview is typical in most research contracts between the university and private businesses.

Eventually Rausser hopes California agribusiness groups will choose to participate in the agreement, since one of the ultimate beneficiaries of the research may be California's $27 billion agriculture industry. "This agreement provides a unique opportunity for California agriculture," said Thomas F. DiMare, former chair of the Western Growers Association and the California Tomato Board. "Because the university is a public institution, farmers will have better and more cost-effective access to agricultural biotechnology."

Faculty researchers in UC–Berkeley's Department of Plant and Microbial Biology experiment with genetic engineering techniques to produce new crops and make foods safer, cheaper, and more nutritious. In recent years they have found ways to improve the baking qualities of bread, to make milk less allergenic, and to help plants resist attack by pathogenic organisms.

Edward Shonsey, president and CEO, Novartis Seeds.

These are precisely the areas on which the next wave of biotechnology research will focus, said Briggs. Whereas the first wave of biotechnology breakthroughs dealt largely with production, the next wave will focus on food quality, safety, and nutrition.

Details of the collaboration agreement can be found on the Web by visiting http://www.berkeley.edu/ and striking "News & Events," then "U.C. Berkeley Press Releases" and scrolling down to the four 11/23/98 news releases on this agreement.

Edward Shonsey, president and CEO of Novartis Seeds, and Buchanan are strong supporters of the ASPP Education Foundation. Shonsey is a member of the foundation's board, and Buchanan, a past member of the board, served with Shonsey.

Check the ASPP Web site (http://aspp.org) and watch your mail in March for the Plant Biology '99 registration package, housing information, and preliminary program. The annual meeting will celebrate ASPP's 75th Anniversary this year, so be sure to mark your calendar.

Years of Interactions Lead to Novartis/UC–Berkeley Plant Research Collaboration

ASPP member Wilhelm Gruissem, past chair of the Department of the Plant and Microbial Biology at the University of California, Berkeley, began cultivating relationships with potential industry research collaborators several years ago. His efforts, combined with those of current department chair Bob Buchanan and others, grew into the groundbreaking research agreement with Novartis and the Department of Plant and Microbial Biology (PMB). Dr. Gruissem addresses various aspects of the agreement in the following remarks.

What led to the decision to partner with only one company, Novartis?

Dr. Gruissem: After I received the first overture for department support, my colleagues and I consulted with Dean Gordon Rauser (a renowned economist) on how to best maximize benefits for the department and the industrial partner. Traditionally, industry contract research in universities is narrow, is often proprietary, and restricts graduate students or postdocs in talking about the work. After long discussions among the faculty, we embraced a concept that would ensure that industry support to the department was as unrestricted as possible, that any industry partner would recognize and appreciate the breadth of the department's research programs, and that our graduate students and postdoctoral researchers would have access to industry proprietary technologies and genomics information to facilitate their research. Also, we decided that interacting with one industrial sponsor within the framework of this concept would have the most favorable impact on the academic mission of and communication in the department.

Bob Buchanan, Peggy Lemaux, Dean Rausser, and I visited several companies to discuss this concept, and in early 1998 we asked the most seriously interested companies for proposals outlining their terms and conditions for an industry-supported research collaboration with the department. The proposal from the Novartis Agricultural Discovery Institute, Inc. (NADII), was most closely aligned with our concept and academic mission. Steven Briggs, NADII president and an ASPP member, also contributed significantly to the successful outcome of the agreement for the PMB–NADII research collaboration.

What has been accomplished?

Dr. Gruissem: Obviously, a lot of concerns are being raised about the type of academic–industry relationship into which we have entered, many of which are based on misconceptions and misinformation. The collaborative research agreement between the university and NADII is now publicly available. Everyone can look at the terms and conditions of the partnership. Most important, we accomplished our original goal—support for our graduate program—by securing substantial funds for the next five years for student training. Next, we attracted support to advance basic research. It is important here to recognize that the NADII money comes to the department before faculty members submit research proposals on their interests. The Research Committee (which I have been elected by the faculty to chair) will select among the proposals and make funding decisions following strict guidelines.

Based on the research support NADII is providing, the benefits negotiated by NADII (licensing rights and so on) are fair and reasonable. Finally, in our collaboration with NADII, we now have access to technologies and information that would have been impossible to develop on our own. The fact that 30 out of 32 department faculty members have endorsed the collaboration with NADII is a demonstration of confidence and support for the original concept that we preserved throughout the negotiations. I think it is important to realize also that there is a substantial element of trust that both parties bring to this partnership.

Together, we accomplished an agreement that preserves academic freedom and that will allow our graduate students and postdoctoral researchers to get the best training and to do cutting-edge work. I am convinced that other university–industry agreements in the future will be measured against what we accomplished, which I hope will be for the betterment of research in plant and agricultural biotechnology. Furthermore, I think that we have broken new ground, at least to some extent, in university–industry relationships, which I believe are necessary to explore the full potential of discoveries in plant science.

Call for Nominations for Officers and Awards

The annual call for nominations for officers and awards will be mailed to all ASPP members in February 1999. Nominations for officers are due at headquarters by March 12, 1999; those for awards are due at headquarters by April 5, 1999.

ASPP members will be nominating for the offices of president-elect (succeeding Deborah Delmer) and elected member of the ASPP Executive Committee (succeeding Natasha Raikhel). The president-elect will serve under that title in 1999–2000, as president in 2000–2001, and as immediate past president in 2001–2002. The elected member will serve on the ASPP Executive Committee for three years, 1999–2002.

Awards to be presented in 1999 include the Charles Albert Shull Award, the Charles Reid Barnes Life Membership Award, the Martin Gibbs Medal, the Adolph E. Gude, Jr., Award, and the Corresponding Membership Award. The nominating ballot explains the qualifications for each of the awards and the procedure for submitting a nomination. Awardees will be selected from among nominees by the appropriate awards committees (see page 5). Awards will be presented at a ceremony during Plant Biology '99, ASPP's annual meeting, in Baltimore, Maryland.

Members are urged to participate in the nominating process. If you do not receive your ballot, please contact Amy Vollmer at ASPP headquarters (telephone 301-251-0560, ext. 22; fax 301-279-2996 or 301-251-6740; or e-mail avollmer@aspp.org).

Power Outage

Due to a severe ice storm that hit large parts of Maryland in mid-January, the ASPP headquarters office was without power from Friday, January 15, through Wednesday, January 20. We realize that many of you tried to reach us during that time, by phone, fax, or e-mail, but were unable to get through. We're sorry for the inconvenience and are happy to report that we are once again fully operational.

ASPP Education Foundation Video News Release Explains Benefits of Plant Research

As part of its effort to increase public awareness of the importance of plant science research, the ASPP Education Foundation produced a video news release of its "Plants for the 21st Century" exhibit at Epcot, which reached a mass audience in the United States.

The video news release was carried by AGDAY Television National Network, which includes major media markets across the United States. Carrying the news release on the evening news between 4:30 p.m. and 7:30 p.m., AGDAY reached cities and communities in 41 states. AGDAY has a network of 161 television stations across the nation.

Small towns as well as large received the news. Some of the cities reached include Albany, Albuquerque, Amarillo, Cheyenne, Atlanta, Augusta, Bloomington, Bowling Green, Cleveland, Colorado Springs, Columbus (Ohio), Columbus (Georgia), Cedar Rapids, Denver, Des Moines, El Paso, Florence, Fort Wayne, Grand Junction, Green Bay, Greensboro, Harrisburg, Idaho Falls, Indianapolis, Lansing, Lexington, Lincoln, Madison, Memphis, Minneapolis, Missoula, Mobile, Montgomery, Nashville, New Orleans, Oklahoma City, Oregon, Orlando, Pensacola, Peoria, Phoenix, Portland, Raleigh, Rapid City, Sacramento, San Francisco, Spokane, Tallahassee, Wichita, and Wilkes-Barre.

The video contains highlights of the ASPP Education Foundation exhibit, held at the Epcot Science Jam March 13 through April 4, 1998, and at the annual Epcot International Flower and Garden Festival, April 17 through May 31, 1998. Viewers see and hear presenters and visitors in the exhibit's colorful market of fruits and vegetables. The video news release explains several examples of how plant research, including research using biotechnology, is helping "farmers and plant scientists make the world a better place to live."

Looking Forward: News from CSWIPP

The Committee on the Status of Women in Plant Physiology (CSWIPP) held its first-ever mid-year meeting immediately following the January 14th ice storm that paralyzed ASPP headquarters and the entire Washington, DC, area. Among the issues discussed by the committee were the two events—a luncheon and a workshop on alternative careers—it is sponsoring at the next ASPP annual meeting, which takes place July 24–28, 1999, in Baltimore. Both events are scheduled for Monday, July 26, 1999. The luncheon will be held at noontime and the workshop in the evening. The luncheon speaker will be Elaine Dowse, of Human Dynamics, Inc. Ms. Dowse is a commentator for National Public Radio and has spoken at functions hosted by American Women in Science. The committee expects that she will give an informative and entertaining talk.

Sticking closely to the "alternative" moniker, CSWIPP hopes to bring to the careers workshop panelists representing patent law, policymaking/regulatory affairs, technology transfer, genomics/bioinformatics in an industry setting, scientific writing/publishing, and the corporate financial profession (for example, a financial analyst or a venture capitalist). By holding the workshop in the evening, the committee hopes to host a mixer following the panelists' more formal short presentations and round-table discussions. Additional details will be forthcoming in the next issue of the *ASPP NEWS,* via the "Hot News" button on the ASPP homepage (http://aspp.org), and with your registration package. Attendance is limited, so please return your meeting reservation form promptly to reserve your seat.

ASPP Travel Award Program for Plant Biology '99 in Baltimore! Call for Applications

ASPP is proud to announce that applications for travel awards to Plant Biology '99 are now being accepted for consideration. The application form appears on the facing page of this issue of the *ASPP NEWS* and will be posted on the ASPP homepage at http://aspp.org.

The Society has allotted $35,000 for the continuation of the travel award program, but the selection guidelines have been revised for the 1999 awards so that we may distribute more awards for people to attend the meeting. The goals of the program are to increase attendance of young scientists at the annual meeting by providing travel funds for those in financial need and to increase diversity among the annual meeting attendees. Undergraduate students are heartily encouraged to apply, in addition to graduate students, postdocs, and faculty beginning their careers in plant science.

Applicants will need to estimate their expenses as a proposed budget on the form to be considered for an award this year. The housing costs should be calculated for the least expensive option for student housing or shared accommodations. Transportation costs should also be estimated on the basis of the least expensive mode of transportation to Baltimore. The registration fees will vary, depending on the applicant's academic status. Applicants will be asked to sign a statement confirming that they have researched the costs and that they are requesting the least expensive options.

It is required that applicants submit an abstract of research to be presented at the meeting; they will also be asked to write a paragraph on the form expressing why attending Plant Biology '99 would enhance their career. Two letters of recommendation are expected as well.

Selection criteria will be based first on the science and the quality of the abstract, second on the statement about how attending will have an impact on the applicant's career, third on the strength of the recommendations, and fourth on ethnic diversity. Applications must be received at ASPP headquarters by March 15. Those applicants selected to receive an award will be notified by April 30, and the money will be sent in advance of the meeting. The early-bird registration cutoff date is June 14, and housing reservations must be made no later than June 20, 1999.

ASPP TRAVEL GRANT APPLICATION FORM, 1999

ASPP is offering a limited number of travel grants for students and faculty beginning their careers to attend Plant Biology '99 in Baltimore, Maryland. Undergraduate students and underrepresented minorities (African American, Hispanic, Native American, Alaska Natives, and Pacific Islanders) are especially encouraged to apply. Application deadline is March 15, 1999. Applicants will be notified of committee's decision by April 30, 1999.

DIRECTIONS: Complete this form and mail with the following:

- Brief curriculum vitae
- Adviser's letter of recommendation, including level of funds available, if any, for applicant travel, and one other letter of recommendation (students and postdocs only); faculty do not have to submit letters of recommendation
- Current and pending support (faculty only)
- Any additional sheets required to answer questions posted below

Submit completed application and all attachments by March 15, 1999, to **Travel Grants,** American Society of Plant Physiologists, 15501 Monona Drive, Rockville, MD 20855-2768, or fax to 301-309-9196.

Name: _____

Circle one: Undergraduate Student Graduate Student Postdoc Faculty

Telephone: _____ Fax: _____ E-mail: _____

Institution: _____

Street: _____

City: _____ State: _____ Zip Code: _____

ASPP Member? Yes No

Have you previously received an ASPP Travel Grant? Yes When? No

List plant science organizations in which you hold active membership:

_____

On a separate page, please submit your research abstract and a paragraph in which you explain why attending Plant Biology '99 is important to your career development.

Please circle the group to which you belong.

African American • Hispanic • Native American • Alaska Native • Pacific Islander

Asian American • Caucasian

OVER

Proposed Budget

Early-bird registration cutoff is June 14, 1999. Housing forms will be available in early March. Cutoff registration dates for hotels is June 20, 1999.

I am requesting funds for housing: Yes No How many nights?

Days Inn for students is $109.00 flat rate for single, double, triple, or quad accommodations.

Student/Postdoc housing *may* be available at The Johns Hopkins University for approximately $30–$40/night.

Other hotels will cost an average of $140.00/night. Average length of stay is 4½ nights. Add 12.5% tax.

Total funds requested for housing: _____

Per diem is $25.00. **TOTAL** (multiply $25.00 by number of days attending Plant Biology '99): _____

Registration. Please circle appropriate category and amount requested.

Undergraduate: $95 Member; $125 Nonmember

Graduate: $95 Member; $125 Nonmember

Postdoctoral: $140 Member; $190 Nonmember

Faculty: $185 Member; $275 Nonmember

Transportation mode: Please circle or write appropriate mode of transportation.

automobile airplane train bus other: _____

Total estimated cost for roundtrip transportation: _____

I have investigated transportation options and my signature indicates that I have requested funds for the most cost-effective option available.

Signature of applicant _____

Matching funds. Are you requesting additional funds from other organizations or from your institution?

If yes, please indicate from whom and the amount requested.

Yes Amount requested Name of department No

Total Amount Requested (add all subtotals above): _____

Western Section

The Western Section of ASPP (WS-ASPP) recently presented a special topics conference entitled "Plant Genomics '98: Scientific and Professional Opportunities." The meeting was held November 14–15 at the Hyatt Regency Hotel at Fisherman's Wharf, San Francisco. It was organized by the executive officers of WS-ASPP: Rolf Christoffersen (University of California, Santa Barbara), chair; Frances DuPont (USDA/ARS), secretary–treasurer; and Sharman O'Neill (University of California, Davis), ASPP Executive Committee representative. The conference was also attended by several ASPP headquarters staff, including the new executive director, John Lisack, Jr., and Kelley Noone, membership services coordinator, who represented Susan Chambers, ASPP director of finance and administration. It was supported by WS-ASPP membership dues and by supplemental funds from ASPP. It was advertised by e-mail and mailings to the WS-ASPP membership and via the WS-ASPP Web Site at http://lifesci.ucsb.edu/WSASPP/plantgenomics98.htm. More than 225 participants attended from diverse regions of the West, including Hawaii, Saskatchewan, Montana, Washington, Arizona, and California. The conference was a rousing success and an outstanding event for all.

Rolf Christoffersen introduced Dr. Anthony Carrano (Lawrence Livermore National Laboratory), who led Session I on Structural Genomics. He presented a talk on the tremendous impact of genomics, especially the Human Genome Project, on basic and applied sciences. He was followed by Dr. Nancy Federspiel (Stanford University DNA Sequencing and Technology Center), who presented information about the Arabidopsis Genome Project and showed a video on microarray analysis. Other speakers in the Structural Genomics session included Dr. Steve Tanksley (Cornell University), who spoke about the use of genomic tools to explore and utilize natural plant variation; Dr. Thea Wilkins (University of California, Davis), who presented the new Cotton Genome Project; and Dr. Jorge Dubcovsky (University of California, Davis), who addressed genomic synteny in cereals.

Session II: Functional Genomics was chaired by Frances DuPont. Joe DeRisi, a graduate student in Dr. Patrick Brown's lab at Stanford University, gave an exciting talk on the use of microarray analysis to study both metabolic and developmental changes in gene expression in yeast. He was followed by Dr. Virginia Walbot, who gave an elegant preview of the use of *Mu* for gene tagging in maize. Dr. David Galbraith (University of Arizona) gave an interesting video presentation on the use of GFP and cell sorting for high throughput analysis of gene expression. Dr. Gerald Lazo (USDA/ARS) presented an overview of the Grain Genes database, and Dr. Justin Roberts (University of California, Riverside) rounded out the session with his stimulating presentation on proteonomics.

Session III was a well-attended poster session and happy hour. Two dozen posters were displayed. The highlight of the evening was a salmon dinner event, in which the Western Sections's newly elected executive officers were introduced: Dina Mandoli (University of Washington), chair; Sharman O'Neill (University of California, Davis), vice chair; Elizabeth Van Volkenburgh (University of Washington), Secretary–Treasurer; and Dean Della Penna (University of Nevada), ASPP Executive Committee representative. The three outgoing officers received recognition award plaques from John Lisack Jr., on behalf of ASPP, and Deborah Delmer (University of California, Davis) was introduced as ASPP president-elect. After dinner the conference participants were treated to a special presentation by Dr. Judith Verbeke, program director at the National Science Foundation, division of Integrative Biology and Neuroscience, entitled "Federal Funding Initiatives in Plant Genomics." The informative talk focused on the direction of future funding and various program resources for plant biologists.

The second day of the conference consisted of Functional Genomics II. Dr. Delmer chaired this session and also spoke on the functional genomics of plant cell wall assembly. Other speakers included Dr. Terri Lomax (Oregon State University) on hormone-responsive genes, Dr. Dean Della Penna on nutritional genomics, Dr. Valerie Williamson (University of California, Davis) on disease resistance genes, and Dr. Katey Dehesh (Calgene Inc., Davis) on genomic approaches for modifying plant lipid composition.

More than 25 percent of the ASPP members who live in the Western Region are members of WS-ASPP. Please support our future efforts by joining the WS-ASPP regional section. A follow-up conference on plant genomics is being planned for the near future by our new executive officers. Additional conference photographs can be viewed on the WS-ASPP web site at http://lifesci.ucsb.edu/WSASPP/plantgenomics98.htm. Have a look to see if you're there! We extend a special thanks to Michael O'Neill, editor/science writer (BioBeat Online Magazine: http://www.biobeat.com) of *PE*

continued on page 14

Session I: Anthony Carrano, Nancy Federspiel, Sharman O'Neill, Rolf Christoffersen.

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Poster session: Dr. Huguette Albrecht discussing her poster with Dr. Nick Ewing, as conference participants.

Applied Biosystems (Foster City, California), for his wonderful photographs of the conference participants and activities. We also express our heartfelt thanks and appreciation to former ASPP executive director Ken Beam, Susan Chambers, and ASPP president Brian Larkins, for their encouragement and support of WS-ASPP over the past three years.

Sharman O'Neill
Head, Conference Organizing Committee
Vice Chair, WS-ASPP

Workshop in China

ASPP will be cosponsoring a workshop in China with Huazhong (Central China) Agricultural University and the Chinese National Natural Science Foundation. The workshop's goal is to foster exchange and collaborations in research and teaching.

Entitled "Advanced Plant Biochemistry: Signal Transduction and Metabolic Engineering," the workshop will be held in Wuhan, China, from June 8 through June 18, 1999. It will involve lectures, laboratory exercises, seminars, and target group interactions. Xuemin Wang, of Kansas State University, is the U.S. coordinator for the workshop. Qifa Zhang, of Huazhong Agricultural University, is the Chinese coordinator. The U.S. and Canadian speakers are Illimar Altossaar, University of Ottawa, Ming Cheng, Monsanto at St. Louis, Susheng Gan, University of Kentucky, Tuan-Hua David Ho, Washington University, Scot Hulbert, Kansas State University, Bruce McClure, University of Missouri, Thomas Okita, Washington State University, and Pam Ronald (pending), University of California at Davis.

For more information, please contact Qifa Zhang (qifazh@public.wh.hb.cn) in China or Xuemin Wang (wans@ksu.edu) in the United States.

LETTER TO THE EDITOR

Help Stamp Out Higher Plants

Based on evolutionary relationships between organisms, the living world is now divided in six Kingdoms according to the most widely accepted scheme: Archaebacteria, Eubacteria, Protista, Fungi, Plantae, and Animalia. Among the plants there are several subdivisions: non-vascular and vascular plants, with the latter divided into several groups including the gymnosperms and the angiosperms (flowering plants). There is no mention of "higher plants," a term in common use today.

"Key word" identification in a frequently used database shows that the term "higher plants" appeared in the title of 220 papers in 1998. Long, long ago the plant world was divided into lower plants and higher plants, but no one really knew where to draw the line. So, the term was abandoned because it is imprecise. Are those papers about flowering plants, seed plants, vascular plants, all plants that are not algae; does the term include green algae but not other algae? You get our drift.

Help stamp out "higher plants." The term is not precise and therefore does not belong in scientific writing. After all, when was the last time you saw a paper in the *Journal of Biological Chemistry, Cell,* or *General Physiology* about higher animals?

Alice C. Harmon
University of Florida, Gainesville
Maarten J. Chrispeels
University of California San Diego

PEOPLE

Elliot Meyerowitz Receives NAS Award

The Richard Lounsbery Award, medal, and $50,000 prize, awarded annually in recognition of extraordinary scientific achievement in biology and medicine and alternating between young American and French scientists, has been given to Elliot M. Meyerowitz. Meyerowitz, an ASPP member and professor of biology, California Institute of Technology, Pasadena, was chosen "for his pioneering contributions to the molecular genetics of plant architecture, which have practical implications for agriculture." The award was established in 1979 by Vera Lounsbery in memory of her husband.

Important Dates

Abstract submission deadline: March 1, 1999

Officer nominations close: March 12, 1999

Award nominations close: April 5, 1999

Washington, DC, Section meeting - Arboretum: February 19, 1999

Midwest Section meeting - Michigan State University: March 19–20, 1999

Southern Section meeting - Louisiana State University: March 27–29, 1999

Northeast Section meeting - University of New Hampshire: April 23–24, 1999

Plant Biology '99 - Early-bird registration cutoff: May 24, 1999

Plant Biology '99 - Housing registration cutoff: June 14, 1999

Plant Biology '99 - Baltimore, MD: July 24–28, 1999

ASPP Education Forum

Compiled and edited by Bob Wise, Department of Biology, University of Wisconsin–Oshkosh, Oshkosh, WI 54901, e-mail wise@uwosh.edu

Plant-Ed Turns Four!

For the past four years, Plant-Ed has served the international community of plant biology educators as an electronic forum for exchanging information related to teaching courses on plants. Plant-Ed is a BIOSCI newsgroup currently housed at both the Stanford University Library and the Daresbury Laboratory, Warrington, United Kingdom. It was initiated in fall 1994 as a prototype newsgroup available only by e-mail, and in June 1995, after a favorable vote, became a full-fledged newsgroup distributed by USENET News. Users can subscribe to the e-mail version (biosci-server@net.bio.net) or read and post messages through USENET newsreader software or through the Web. The Plant-Ed charter is reproduced at the end of this article.

The types of questions posted to the newsgroup have been so diverse that a few examples here would not do them justice. On numerous occasions, reading someone else's question has made me realize that I have had the same question but never the need to find the answer. My classes have been improved by simply watching the messages on Plant-Ed! Readers of the newsgroup may reply publicly or privately, but public conversations can become quite interesting. Every week I am reminded of the thoughtfulness and helpfulness of Plant-Ed users both from the public replies and from the compilations of replies sent back to the group. There are truly a lot of kindhearted souls out there willing to take the time to answer questions. The importance of this feedback cannot be underestimated, especially at smaller institutions where expertise is not often right down the hall. Thank you!

The number of Plant-Ed users is hard to determine because anyone can read and post messages without subscribing. The number of e-mail subscribers has stabilized at about 300, from at least 16 different countries. The number of messages per month has been about 100 for the past three years. At about three messages per day, the service is not an overwhelming burden to keep up with, yet one is reminded of its presence often enough to know that one is connected to a large group of generous colleagues.

Unlike private listservs, unmoderated BIOSCI newsgroups are open to junk mail postings (spams), which at times can be quite annoying. Replying to spam rarely has the desired effect and causes subscribers to have to delete not only the spam but also the reply, so replies are not encouraged. Deleting spams quickly is currently the best option. BIOSCI has experimented with electronic filtering systems, but they all have drawbacks. Another option is to pass every message through a moderator, but this requires some effort on the part of the moderator, and the spontaneity of conversation is lost. In June 1997, Plant-Ed voted to have a moderator, but the BIOSCI administrators decided to delay the initiative. The rate of spams subsequently declined, so Plant-Ed is currently not moderated.

All past messages (over 4,200) sent to Plant-Ed since its inception are archived in a searchable database at http://www.bio.net/hypermail/PLANT-EDUCATION/. It may be worthwhile checking there to see if a topic has been discussed in the past, but it certainly isn't required.

If you are currently a reader or subscriber, thanks for helping to make Plant-Ed a successful newsgroup for the past four years! If you are not a user and would like to find out more about Plant-Ed and the other 103 BIOSCI newsgroups, connect to http://www.bio.net/, where you can find links to sponsors, answers to frequently asked questions, archives for all of the BIOSCI newsgroups, and information about subscribing and unsubscribing.

To subscribe to Plant-Ed (if you are in the Americas or the Pacific Rim), send the message "subscribe Plant-Ed" to the address biosci-server@net.bio.net. A subject is not necessary. If you are in Europe, Africa, or Central Asia, please read the instructions on how to subscribe at http://www.bio.net/biosci/docs.html. Some may find it more convenient to use USENET newsreaders to access Plant-Ed messages. Messages are distributed under the name bionet.plants.education. Contact your local computing support office for more information on newsreaders.

To use Plant-Ed send your message to plant-ed@net.bio.net. Include a short but descriptive subject, since many potential readers will choose whether or not to read a message based only on its subject. At the end of each message, please include your name and how you can be contacted. Subscribers automatically receive all messages sent to Plant-Ed. When replying to a message, please keep the subject the same so browsers can easily follow threads. Unlike some listservs, replies to BIOSCI messages go only to the original sender. Therefore, please copy or forward your reply to Plant-Ed for everyone to read. For specific questions feel free to contact me, Jon Monroe, at monroejd@jmu.edu or Susan Singer at ssinger@carleton.edu. Thanks again for making the past four years a plant-educational experience!

Subscribers are welcome. Contributions within the functions outlined above are encouraged.

Jonathan Monroe
James Madison University
Harrisonburg, Virginia

Plant-Ed Charter

The purpose of the Plant-Ed Newsgroup is to provide a means for communication among instructors, lab preparators, and graduate assistants who teach courses in any aspect of plant biology at both the undergraduate and graduate levels.

This newsgroup provides:

- A forum for the exchange of innovative laboratory and classroom activities
- A forum for discussing the role of plant education in introductory biology courses and ways for improving student perceptions of plants
- A forum for the exchange of information about educational opportunities for students and faculty (REU programs, teaching workshops, and the like)
- A forum for the exchange of information on textbooks, Internet resources, visual materials, and interactive computer programs
- A source of quick help for last-minute troubleshooting, conditions for plant growth, sources of materials, and practical advice
- An archive of searchable information for future use by instructors of plant courses.

Photosynthesis Links

A collection of more than 100 links to pages related to photosynthesis research has been assembled by Michal Koblizek (Laboratory of Photosynthesis, Trebon, Czechia) and is available at http://www.alga.cz/links.htm. The material

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contains references to general resources and to books, laboratories, personal pages of scientists, pages of societies and journals, pages of companies and equipment, conferences, teaching materials, and structures of some photosynthetic complexes. Dr. Koblizek says that comments, additions, and reports on any bugs will be appreciated.

Book Review

David Dalton, Editor

At its November 1998 meeting, the ASPP Education Conmmittee voted to initiate a book review column as part of the "Education Forum." This occasional feature is edited by David Dalton, associate professor at Reed College, Portland, Oregon. The column has a special interest in plant science textbooks but will consider other materials of educational value. Send materials for review to Dr. Crispin Taylor, ASPP, 15501 Monona Drive, Rockville, MD 20855-2768 USA.

Introduction to Plant Physiology, *by William G. Hopkins. John Wiley & Sons, New York, 1998. ISBN 0-471-19281-3. Hardcover. $86.95.*

Second editions of two plant physiology textbooks have been released this year: *Plant Physiology,* by L. Taiz and E. Zeiger, and *Introduction to Plant Physiology,* by W. G. Hopkins. They both follow a similar plan of organization, but beyond that are actually quite different. Taiz and Zeiger's text takes a more molecular approach than does Hopkins's, and in some areas offers more detail—probably a reflection of the fact that 21 authors contributed to Taiz and Zeiger, each an expert on his or her topic and each chapter being somewhat of a mini-review. On the other hand, *Introduction to Plant Physiology* was written by a single author—one who has done a remarkable job of covering the principles of plant physiology in a comprehensive way.

The book starts with a chapter that reviews plant and cell structure, followed by 22 chapters organized into four sections: water and mineral relations, energy and carbon metabolism, regulation of plant development, and stress physiology and biotechnology. There are 13 boxed essays scattered throughout the book and a short appendix on measurement of water potential and its components. Hopkins follows the common approach of treating water relations first, a tactic that has always puzzled me. For reasons I will discuss later, I do not think it a logical place to start.

In the first section, the chapter on cell–water relations is particularly well done. It is the best discussion of the derivation and use of water potential that I have seen in a textbook, especially in its clarification of the terms "osmotic pressure" and "osmotic potential." The chapter on transpiration is not as satisfying. It would be improved considerably with a better explanation and analysis of resistances/conductances and concentration gradients. Chapters on absorption by roots and long-distance transport of both water and minerals are well done. The usual chapter on nitrogen metabolism is inserted at the end of the first section, in contrast to other texts, where it usually is included with photosynthesis and respiration, which I think is more logical. Also included in the chapter on nitrogen metabolism is a boxed essay describing enzymes, which to me appeared out of place and, at three pages, too brief.

The second section starts with an excellent chapter on light energy and pigments, followed by a chapter on gas exchange and one on light harvesting and the photosystems. The chapter on gas exchange interrupts the continuity of the section and probably would be better placed at the end. However,/it is this chapter in which Hopkins decided to discuss chloroplast structure, which obviously should precede the description of the photosystems and their operation. I was surprised to see the notorious perimeter law of diffusion through stomatal pores resurrected here, a topic best left forgotten by those who have heard of it and best not introduced to those who have not. The chapter on carbon metabolism is excellent. Carbon dioxide fixation and the carbon reduction cycle are clearly explained, followed by a good description of photorespiration and its consequences, as well as the possible benefits of the process. This is followed logically by a discussion of the C_4 and crassulacean acid metabolism (CAM) modifications and a nice treatment of the costs–benefits of these modifications and their ecological significance. There is a good chapter on phloem translocation and finally the inevitable chapter on respiration, which includes the typical description of glycolysis and the Krebs cycle and examples of some alternate pathways. The section concludes with a chapter on overall productivity and one on secondary metabolites.

The third section begins with a chapter that describes and distinguishes growth and differentiation. It includes a good description of the growth of individual cells, populations of cells, and multicellular organisms. The next chapter introduces the major classes of hormones, including brief, interesting historical aspects of the discovery of each one. It is followed by a chapter on the mode of action of hormones, which is largely a biochemical description of the synthesis of each hormone and examples of how some of them work, such as the acid-growth theory of cell expansion and gibberellin control of cereal seed germination. Then, rather than a separate chapter on each hormone class and the responses associated with that hormone, there are three chapters on processes and activities in which hormones play an important role. One is on photomorphogenesis, another on plant movements, and a third on photoperiodism and rhythmic behavior. I like that approach, and all of the expected topics are included. The fourth section is a pair of chapters, a brief one on stress physiology and one on biotechnology.

I used this text in a junior-level course taught to plant science majors and several nonmajors during the fall semester, and I requested written opinions of the text from the students. I received 38 detailed responses. They were almost unanimous in their satisfaction with the book, although there were some criticisms. One of the most common was that some topics were covered in too much detail, whereas others were treated very briefly. In addition, many students found the detailed discussions hard to follow. I agree that there is some unevenness in treatment, but I don't think it is an overwhelming problem. On the other hand, I do agree with the other major criticism, which is the somewhat confusing organization of topics. For example, as I already mentioned, the enzyme discussion was too brief and located too far away from the topics in which enzymes are important. Many of the students taking an introductory plant physiology course have not had a good introduction to enzymes in other courses, and it would have been appropriate to include that in this book because so much of the understanding of photosynthesis and respiration and related topics depends on having a decent understanding of simple enzyme kinetics. The chapter on gas exchange that I mentioned as interrupting the flow of discussion of the light reactions of photosynthesis is another example. Several students had difficulty with the discussion of glycolysis, especially the diagrams. That may be due not only to how the diagrams were presented, but also because this simple, straightforward, linear series of reactions was presented in three separate figures, separated by two pages. This is in contrast to the Krebs cycle, which was presented in the traditional manner—taking

up the better part of a whole page and presenting all the steps in one picture.

Deciding on the organization of topics is certainly subjective, but I think some decisions make more sense than others, particularly from a didactic standpoint. Over the years, I have found that it is best to start with a discussion of what energy is, how it is expressed, and how it is used by the cell. This includes description of free energy and spontaneous reactions, the role of oxidation/reduction in energy transfer, and why molecules like ATP and NAD are important. That leads naturally into how these things are involved in energy transfer and used to do work in the cell. The reactions involved in respiration and the need for enzymes logically follow. Then, it becomes obvious how important the process of acquiring energy in the first place is, and the unique role of plants via the process of photosynthesis is apparent. Starting with water relations has no such obvious basis.

In general, the figures and diagrams in the book are well done, and the students thought they were very helpful. However, the most frequent comment was that a little more color would help. The four pages of color plates inserted in the middle of the book were not helpful. Several students also said that a glossary would be desirable. Last but not least, we found several errors that apparently slipped by the proofreaders. In summary, though, I like the textbook and will use it again. The book against which it will be compared is Taiz and Zeiger, but I see no problem. I think the two books will have different audiences. For a beginning undergraduate course in general plant physiology, especially for students without an extensive chemistry background and for those not majoring in the plant sciences, Hopkins's *Introduction to Plant Physiology* will probably be the more popular choice. For the graduate-level course in plant physiology, or for the more advanced undergraduate student with a good background in biochemistry and some background in molecular biology, Taiz and Zeiger will probably be the more popular selection.

James W. O'Leary
Department of Plant Sciences
University of Arizona
Tucson, AZ 85721

The ASPP Education Committee held its fall meeting November 6–7, 1998, at ASPP headquarters in Rockville, Maryland. Looking ahead to a year filled with many helpful education programs are (from left) John Lisack, Jr., ASPP executive director, Gary Kuleck, committee chair, John Markwell, Paul Williams, and Carol Reiss. Not shown is Eric Davies.

OBITUARIES

J. Brian Mudd

A SPP member and long-time smog researcher J. Brian Mudd recently died of complications from kidney disease.

Dr. Mudd, professor emeritus in the Department of Botany and Plant Sciences at the University of California, Riverside, was a faculty member at UCR for over 20 years. He also spent nine years in private research institutions before being named director of the Statewide Air Pollution Research Center at UCR in 1990.

Researchers at the center have probed how emissions contribute to smog formation and depletion of the earth's protective ozone layer. They have been at the forefront of scientific studies involving how pollutants attack plants, including crops important to California agriculture.

During his tenure as director, Dr. Mudd was also professor of plant physiology. He retired in 1993 and continued to research ozone–plant cell membrane reactions until recently.

A native of Darlington, England, Dr. Mudd earned a bachelor's degree in natural science from Cambridge University, a master's degree in plant sciences from the University of Alberta in Canada, and a doctorate in biochemistry from the University of Wisconsin. He was a long-time volunteer with the American Lung Association, Inland Empire chapter.

He is survived by his wife, Monika Ittig, and two children. The family suggests memorial contributions to the J. Brian Mudd Fund, UCR Foundation Office, 250 Highlander Hall, Riverside, CA 92521.

A SPP headquarters was recently informed that emeritus member Dennis James Wort died on November 26, 1998, in Vancouver, British Columbia, at the age of 92.

A SPP headquarters was recently informed that emeritus member Edward Tolbert, past president and Stephen Hales Prize award winner, died on December 13, 1998. Dr. Tolbert was professor emeritus at Michigan State University, East Lansing.

Gatherings

The *ASPP NEWS* publishes dates, titles, locations, and contact names and addresses for meetings, courses, seminars, and the like that are of interest to ASPP members. Submit announcements via e-mail to sbraxton@aspp.org or mail to Sylvia J. Braxton, *ASPP NEWS*, 15501 Monona Drive, Rockville, MD 20855-2768 USA. **Faxed transmissions are not accepted.**

FUTURE ASPP ANNUAL MEETING SITES

1999: Baltimore, Maryland
Saturday, July 24, through
Wednesday, July 28
ASPP's 75th Anniversary!

2000: San Diego, California
Saturday, July 15, through
Wednesday, July 19

1999

FEBRUARY

February 14–18
Gordon Research Conference on Agricultural Science: Genomics in Crop Production
Ventura, California
For information contact Dan O'Keefe (okeefe@esvax.email.dupont.com) or see the GRC Web site at http://www.grc.uri.edu/programs/1999/agsci.htm.

February 28–March 4
Dahlia Greidinger International Symposium on Nutrient Management under Salinity and Water Stress
Technion-IIT, Haifa, Israel
For additional information contact Professor J. Hagin or Ms. Jena Glasscock, Faculty of Agriculture Engineering, Technion, Haifa, 3200, Israel; telephone +972-4-829-2325, fax +972-4-822-1529, e-mail aggreid@tx.technion.ac.il.

MARCH

March 15–16
Molecular Biology's Role in Enhancing Agricultural Productivity: Crop Production and Protection
Amsterdam, Netherlands
Contact Cambridge Healthtech Institute (CHI),. 1037 Chestnut Street, Newton Upper Falls, MA 02464; telephone 617-630-1300, fax 617-630-1325, e-mail chi@healthtech.com, Web site http://www.healthtech.com.

March 21–26
European Symposium on Photomorphogenesis, ESOP 99
Freie Universitaet Berlin, Germany
Organizer: Elmar Hartmann. Contact Hans-Peter Haschke, Freie Universitaet Berlin, Institute of Plant Physiology and Microbiology, Koenigin-Luise-Strasse 12-16, D-14195 Berlin, Germany; telephone +49-30-838-31-28, fax +49-30-838-43-57, e-mail haschke@zedat.fu-berlin.de. Web site http://www.biologie.fu-berlin.de/esop99.

March 25–29
6th International Botanical Microscopy Meeting—Plant Cell Biology
University of St. Andrews, Scotland
For information contact Rebecca Morden, RMS, 37/38 St. Clements, Oxford, OX4 1AJ, United Kingdom; telephone +44-1-865-248768, fax +44-1-865-791237, e-mail info@rms.org.uk.

APRIL

April 6–10
4th International Workshop on Sulfur Metabolism: Sulfur Nutrition and Sulfur Assimilation in Higher Plants: Molecular, Biochemical and Physiological Aspects
Wengen, Switzerland
Contact Dr. Christian Brunold, University of Berne, Institute of Plant Physiology, Altenbergrain 21, 3013 Bern, Switzerland; telephone +41-31-631-49-16, fax +41-31-332-20-59, e-mail piub@pfp.unibe.ch, Web site http://www.botany.unibe.ch/piub/sulfur.htm.

April 21–23
IV European Symposium on Plant Isoprenoids
Universitat de Barcelona, Barcelona, Spain
Organizing Committee: Albert Boronat, Narciso Campos, Albert Ferrer, and Santiago Imperial. For details, please contact Dr. Albert Boronat, Departament de Bioquímica i Biologia Molecular, Facultat de Química, Martí i Franquès 1, 08028-Barcelona, Spain; telephone +34-93-4021194, fax +34-93-4021219, e-mail isoprenoid@sun.bq.ub.es, Web site http://www.bq.ub.es/terpnet.

April 22–25
Plant Biochemistry and Molecular Biology Conferences
Metabolic Networking in Plants
Scheman Building, Ames, Iowa
For more information see our Web site at http://molebio.iastate.edu/~gfst/phomepg.htm.

April 28–May 2
16th World Orchid Conference
Vancouver Trade and Convention Centre
Vancouver, Canada
Check our Web site for detailed information at http://www.hedgerows.com/WOC99/index.htm. E-mail inquiries should be directed to congress@venuewest.com.

MAY

May 2–5
INFORMS Cincinnati Spring 1999
Omni Netherland Plaza
Cincinnati, Ohio
General Chair: David F. Rogers, University of Cincinnati, Cincinnati, OH 45221-0130; telephone 513-556-7143.

May 16–20
6th Symposium on Stand Establishment and the Seed Working Group of the International Society for Horticultural Science
Roanoke, Virginia
Contact Greg Welbaum, Department of Horticulture, Virginia Tech, Blacksburg, VA 24061-0327; telephone 540-231-5801, fax 540-231-3083, e-mail welbaum@vt.edu; visit our symposium Web site at http://www.conted.vt.edu/stand/establishment.htm.

May 18–20
The Second Symposium of The Institute of Molecular Genetics of Tel-Aviv University on Plant Genomics
Maagan Holiday Village, Israel
For information, contact InTour—Travel Agency, Mrs. Margalit Zur, PO Box 9095, Ramat-Gan 52190, Israel; telephone +972-3-6355038, +972-3-6352833, fax +972-3-5351103, e-mail mrgzur@ibm.net.

JUNE

June 5–9
1999 Congress on In Vitro Biology
The Radisson Hotel, New Orleans, Louisiana
Contact Tiffany McMillan; telephone 301-324-5054, fax 301-324-5057. For meeting registration rates and updated program information, visit Web site at http://www.sivb.org.

June 8–18
"Advanced Plant Biochemistry: Signal Transduction and Metabolic Engineering"
ASPP-Cosponsored Workshop
Wuhan, China
For information contact Qifa Zhang (qifazh@public.wh.hb.cn) in China or Xuemin Wang (wans@ksu.edu) in the United States.

June 19–23
Plant Biology Canada '99
(Annual Meeting: Canadian Society of Plant Physiologists)
Delta Bessborough Hotel, Saskatoon, Saskatchewan
Conference Web site: http://www.usask.ca/biology/cspp. Contact Rosemarie Gallays, NRC/PBI, fax 306-975-5571, e-mail rgallays@pbi.nrc.ca.

JULY

July 10–13
Annual Meeting of the Phytochemical Society of North America
Montreal, Canada
Symposium lectures on "Evolution of Plant Metabolic Pathways," a minisymposium on "Brassinosteroids," and oral and poster sessions on all aspects of phytochemistry. For more information, please contact V. De Luca at vince.deluca@seeds.novartis.com, R. Ibrahim at ragibra@vax2.concordia.ca, or L. Varin at varinl@clone.concordia.ca.

July 10–15
27th Annual Meeting of the American Society for Photobiology
Grand Hyatt Washington, Washington, DC
For more information, contact Dr. Sherwood Reichard, Secretariat, 1021 15th Street, Suite 9, Augusta, GA 30901; telephone 706-722-7511, fax 706-722-7515, e-mail maps@csranet.com.

July 10–24
1999 Plant Biochemistry Summer Course
Washington State University, Pullman
For information and registration forms contact Karen Maertens at telephone 509-335-5496, fax 509-335-7643, e-mail maertens@wsu.edu.

July 11–14
The 26th Annual Meeting of the Plant Growth Regulation Society of America (PGRSA)
Costa Mesa, California
For information, check the PGRSA Web site at http://www.griffin.peachnet.edu/pgrsa/.

July 11–16
Forest Biotechnology '99
A joint meeting incorporating the 3rd International Wood Biotechnology Symposium and the IUFRO Working Party for the Molecular Genetics of Trees (S.04-06)
Oxford, England
Contact Malcolm M. Campbell, Department of Plant Sciences, University of Oxford, South Parks Rd., Oxford OX1 3RB, UK; telephone +44-1865-275135, fax +44-1865-275074, e-mail forest.biotech99@plants.ox.ac.uk, Web site http://www.plants.ox.ac.uk/top.htm.

July 11–24
Plant Biochemistry Training Course
Washington State University, Pullman
For information contact Karen Maertens, telephone 509-335-5496, fax 509-335-7643, e-mail maertens@wsu.edu.

July 17–21
International Symposium on Plant Peroxidases
Columbus, Ohio
For more information please contact Dr. L. Mark Lagrimini, Department of Horticulture and Crop Science, The Ohio State University, 2001 Fyffe Ct., Columbus, OH 43210-1096; e-mail lagrimini.1@osu.edu, Web site http://www.hcs.ohio-state.edu/pod/pod.htm.

July 19–23
2nd International Symposium on Plant Dormancy
Angers, France
For information and registration forms contact Dr. J. D. Viemont, Université d'Angers, Faculté des Sciences, 2 Boulevard Lavoisier, F-49045 Angers, Cedex, France; fax +33-241-73-53-52, e-mail jean-daniel.viemont@univ.angers.fr.

July 24–28
Plant Biology '99
Baltimore, Maryland
The 1999 ASPP Annual Meeting will celebrate the 75th Anniversary of the American Society of Plant Physiologists. Contact Susan Chambers, 15501 Monona Drive, Rockville, MD 20855-2768; telephone 301-251-0560, ext. 11, fax 301-279-2996, e-mail chambers@aspp.org or on the World Wide Web see URL http://aspp.org/meetings/meetings.htm.

July 26–30
International Symposium
Auxins and Cytokinins in Plant Development
Prague, Czech Republic
Detailed information about the symposium and a preliminary registration form can be found at http://www.ueb.cas.cz/acpd. Other contacts: Mirek Kaminek or Eva Zazimalova, Institute of Experimental Botany, Rozvojova 135, CZ 165 02 Prague 6, Czech Republic; (Kaminek) telephone +420-2-20390-445, fax +420-2-20390-446, (Zazimalova) telephone +420-2-20390 429, fax +420-2-20390 474. Symposium e-mail acpd@ueb.cas.cz.

AUGUST

August 3–7
6th International Congress on Amino Acids
Bonn, Germany
Contact Bijay K. Singh, American Cyanamid Company, PO Box 400, Princeton, NJ 08543-0400; telephone 609-716-2066, fax 609-275-5216, e-mail singhb@pt.cyanamid.com.

August 28–September 1
Cellular Responses to Oxidative and Osmotic Stress, Sensing, Signalling and Gene Expression
Egmond aan Zee, Netherlands
Meeting registration deadline is April 2, 1999. For information contact Dr. Pim Mager, telephone +31-20-444-7569, e-mail mager@chem.vu.nl, and for more details visit our Web site at http://www.chem.vu.nl/STAR99/index.html.

ASPP Placement Service

This form may be used only by members of the American Society of Plant Physiologists.
Please print or type your placement information on this form (curriculum vitae will not be accepted) and send it to
Ru Yang, ASPP Headquarters, 15501 Monona Drive, Rockville, MD 20855-2768

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Fields of interest, specialties, and publications titles: _____

Thesis, dissertation topics, professor: _____

Professional societies and honors: _____

Degree/year	Major	Minor	College/university and its location

Postdoctoral study (specialty and with whom, where, when): _____

Employer and location	From	To	Position, Title, Duties

References (names, addresses, telephone numbers):

ASPP Job Placement Service

I. Registering with the ASPP Placement Service and Obtaining Placement Files

ASPP headquarters in Rockville, Maryland, operates a placement service in which are kept active two files of resumes of individuals who are seeking employment. Employers are urged to survey the resume files for those seeking permanent positions and those seeking postdoctoral or similar positions. The files cost $25 each and may be ordered from Estella Coley, ASPP Placement Service, 15501 Monona Drive, Rockville, MD 20855-2768 USA. Those seeking employment should complete the Placement Service Form on the facing page to be included in the service.

II. Placing a Position Ad in *ASPP NEWS* and on the ASPP World Wide Web Homepage

Submit all ads by e-mail to Sylvia J. Braxton at sbraxton@aspp.org (or by mail to Sylvia J. Braxton, 15501 Monona Drive, Rockville, MD 20855-2768; **FAXED ADS ARE NOT ACCEPTED**). A fee of $150 for print, Web, or both is charged for all academic/government/industry permanent positions and for all positions, regardless of rank, posted by private companies (private nonprofit companies are not charged a fee). If a fee is charged for your ad, please include billing information at the time the ad is submitted.

- **Academic/Government/Industry Permanent Positions (Ph.D.)**: Limited to 200 words; ad will run 12 weeks on the Web and appear in one issue of *ASPP NEWS*. (If the ad runs only on the Web, the word limit is waived.)
- **Postdoctoral Positions** and **Research/Technical Positions (non-Ph.D.)**: At universities and government installations, limited to 100 words; at private companies, limited to 200 words. Ad will run 12 weeks on the Web and appear in one issue of *ASPP NEWS*. (If the ad runs only on the Web, the word limits are waived.)
- **Assistantships, Fellowships, Internships, etc.**: Announcements of programs and fellowships or internships for students seeking advanced degrees run at no charge and without a word limit. They will run two times in *ASPP NEWS:* the first time, they will run at full length; the second time, they will include location, contact name, and address, with a reference to the original posting. These announcements will run on the ASPP World Wide Web homepage for 12 weeks from the date of posting.

ACADEMIC/GOVERNMENT/INDUSTRY PERMANENT POSITIONS (Ph.D.)

Field Crops Agronomist
Assistant/Associate Professor
University of Maryland, College Park
(Received 11/06)

A tenure-track, 12-month faculty position, with 60% extension and 40% research, is available. The successful candidate will be expected to develop and lead a nationally recognized extension and applied research program with emphasis on field crop (e.g., corn, soybean, small grains) production and sustainable cropping systems management. Close cooperation with scientists in related disciplines and with extension personnel is expected. Qualifications: An earned Ph.D. in agronomy, crop science, soil science, or related discipline. The successful candidate will have a strong background in crop production, cropping systems, and crop physiology. Experience in integrated pest management, nutrient management, data management and analysis, and Internet communication technologies is desirable. For full consideration, applicants should submit a letter of application, curriculum vitae, and undergraduate and graduate transcripts (original transcripts for the Ph.D.) and arrange for four letters of reference to be sent by February 15, 1999, to Dr. Frank J. Coale, Chair, Field Crops Search Committee, Department of Natural Resource Sciences, H. J. Patterson Hall, University of Maryland, College Park, MD 20742. The University of Maryland is an equal opportunity affirmative action employer.

Assistant Professor
University of California, Riverside
(Received 11/09)

The Department of Botany and Plant Sciences, University of California, Riverside, announces a tenure-track appointment in the College of Natural and Agricultural Sciences and in the Agricultural Experiment Station, available July 1, 1999. Salary is commensurate with education and experience. Applicants must have a Ph.D. in a discipline relevant to plant cell biology. Postdoctoral experience is desirable. The successful candidate is expected to employ modern and innovative techniques to explore contemporary cell biology frontiers; examine problems in basic cell biology, utilizing a plant system that can be readily manipulated by genetic or molecular techniques; establish an active research program; contribute to teaching at the undergraduate and graduate levels; and actively participate in the Cell, Molecular, and Developmental Biology Interdepartmental Graduate Research Umbrella. Research areas are open but may include signal transduction, cell cycle, protein targeting, cytoskeleton, and differentiation. The candidate must possess a strong commitment to teaching excellence and a high research potential. Send letter of application, curriculum vitae, statement of research interests, and the names and addresses of at least three references to Dr. Elizabeth M. Lord, Chair, Department of Botany and Plant Sciences, University of California, Riverside, CA 92521-0124; fax 909-787-4437, e-mail lord@ucrac1.ucr.edu, Web site http://cnas.ucr.edu/~bps/homepage.htm. Review of files will begin in January/February 1999 and will continue until the position is filled. The University of California, Riverside, is an affirmative action/equal opportunity employer.

Plant Physiologist
Wright State University, Dayton, Ohio
(Received 11/12)

The Department of Biological Sciences at Wright State University invites applications for a tenure-track position at the assistant professor level. Applicants should have a Ph.D. and will be expected to establish an extramurally funded research program. Postdoctoral experience and research that complements the environmental areas of our department are preferred. Required teaching will include developing a plant physiology course and helping with existing department course offerings at various levels. Applicants should submit a curriculum vitae, names and addresses of three referees, and statements of research and teaching interests to

MAXIMIZE YOUR JOB PROSPECTS!
Check ASPP's World Wide Web site (http://aspp.org/JOBS/) every Friday for new job listings.
Jobs with early application deadlines are listed on the Web site, but might not appear in *ASPP NEWS*.

Plant Physiology Search Committee, Department of Biological Sciences, Wright State University, Dayton, OH 45435. Review of candidates will begin on January 11, 1999. Further information on the department is available on our Web site at http://biology.wright.edu. Wright State University is an EOE/AAE.

Assistant Professor
Purdue University, West Lafayette
(Received 11/16)
A tenure-track position is available for August 1999. Applicant will pursue vigorous, extramurally funded research in genomics to improve agronomically important plants. Research area is open; interest in abiotic or biotic stress, plant development, or plant genome organization, structure, and function is desirable. Teaching plant genetics and participation in graduate/postdoctoral training programs are required. Will engage in cooperative research with plant breeders, physiologists, biochemists, plant pathologists, and entomologists. Ph.D. in plant genetics, plant molecular biology required; postdoctoral experience desirable. Submit a letter of application and statement of professional goals; curriculum vitae with publication list; transcripts of courses; and names, addresses, and telephone numbers of four references to W. W. McFee, Head, Agronomy Department, 1150 Lilly Hall, Purdue University, West Lafayette, IN 47907-1150; telephone 765-494-4774. The application deadline is January 31, 1999, or until a suitable applicant is selected. Purdue University is an equal opportunity/affirmative action employer.

Assistant Professor
Purdue University, West Lafayette
(Received 11/16)
A tenure-track position is available for August 1999 for an assistant professor to develop a creative research program on computational and statistical methodology for analyzing, interpreting, and exploiting molecular genetic data. Teaching an undergraduate course in genetics and participating in the department graduate education program are required. Ph.D. in genetics, statistics, computational biology, or a related field desirable. Postdoctoral experience is preferred. Submit a letter of application that includes a statement of professional goals and aspirations; complete curriculum vitae with publications list; transcripts of all college courses; and the names, addresses, and telephone numbers of four references to W. W. McFee, Head, Department of Agronomy, 1150 Lilly Hall, Purdue University, West Lafayette, IN 47907-1150; telephone 765-494-4774. The application deadline is January 15, 1999, or until a suitable applicant is selected. Purdue University is an equal opportunity/affirmative action employer.

Assistant Professor
Purdue University, West Lafayette
(Received 11/18)
A tenure-track position in plant molecular biology in the Department of Botany and Plant Pathology at Purdue University is available beginning August 1999. A Ph.D. and postdoctoral experience in plant molecular biology, physiology, genetics, or related areas are required. The primary responsibility will be to develop an innovative research program focused on fundamental problems in weed biology that is competitive for sustained extramural funding. Areas of emphasis may include functional genomics and genetics of weed species, molecular mechanisms of resistance to herbicides, molecular basis of plant suppression by allelopathic chemicals, or population biology of important weed species. The successful candidate will have access to the Purdue genomics facility and is expected to develop a graduate course in weed science and contribute to undergraduate teaching. To apply, send curriculum vitae; a brief description of research interests and teaching philosophy; and names, addresses, telephone numbers, and e-mail addresses of three references to Dr. Carole Lembi, Department of Botany and Plant Pathology, 1155 Lilly Hall, Purdue University, West Lafayette, IN 47907-1155; telephone 765-494-4614, fax 765-494-0363, Web site http://www.btny.purdue.edu/. The application deadline is February 15, 1999. Purdue University is an equal opportunity employer, and we encourage women and minorities to apply.

Assistant Professor
Purdue University, West Lafayette
(Received 11/18)
A tenure-track position in fungal biology in the Department of Botany and Plant Pathology at Purdue University is available beginning August 1999. A Ph.D. and postdoctoral experience in plant pathology, mycology, cell biology, genetics, or other relevant areas emphasizing research on fungi are required. The primary responsibility will be to develop an innovative research program focused on fundamental problems in fungal biology that is competitive for sustained extramural funding. Areas of emphasis may include functional genomics and genetics, cell and molecular biology, developmental biology, biochemistry, biophysics, population biology, phylogenetics, and evolutionary biology, with the total effort embracing model fungal systems, fungal plant pathogens, and/or host–parasite interactions. The successful candidate will have access to the Purdue genomics facility and will be expected to develop an undergraduate course in contemporary fungal biology/mycology and a graduate course in their area of expertise. To apply, send curriculum vitae; a brief description of research interests and teaching philosophy; and names, addresses, telephone numbers, and e-mail addresses of three references to Dr. Larry Dunkle, Department of Botany and Plant Pathology, 1155 Lilly Hall, Purdue University, West Lafayette, IN 47907-1155; telephone 765-494-4614, fax 765-494-0363, Web site http://www.btny.purdue.edu/. Application deadline is February 15, 1999. Purdue University is an equal opportunity employer, and we encourage women and minorities to apply.

Assistant Professor
Southern Illinois University, Carbondale
(Received 11/30)
Applications are invited for a tenure-track position as an assistant professor in the Department of Plant Biology. We are seeking a broadly trained individual who utilizes one or more combinations of traditional, genetic, biochemical, and molecular techniques to investigate fundamental problems in plant physiology. Candidates must have a Ph.D. in plant biology/botany or related field (by August 15, 1999) and a strong record of research accomplishments. Postdoctoral research experience, previous teaching experience, and evidence of grantsmanship are preferred. Teaching responsibilities may include CORE plant biology/biology, introductory and advanced plant physiology, and graduate seminar courses. The candidate is expected to develop a strong, externally funded research/graduate program. Further information about the department can be found at our Web site at http://www.science.siu.edu/plant-biology/index.html. Submit curriculum vitae, graduate transcripts, detailed statement of research and teaching interests, representative publications, and the names, telephone numbers, and e-mail addresses of three references to Dr. Andrew J. Wood, Chair—Plant Physiology Search Committee, Department of Plant Biology, Southern Illinois University, Carbondale, IL 62901-6509. The Search Committee will begin deliberations of applications beginning January 15, 1999. Southern Illinois University is an affirmative action/equal opportunity employer.

Molecular Biologist/Plant Physiologist
Postdoctoral Research Associate
USDA/ARS Beltsville, Maryland
(Received 12/03)
The USDA, Agricultural Research Service (ARS), Horticultural Crops Quality Laboratory in Beltsville, Maryland, is seeking a molecular biologist/plant physiologist postdoctoral research associate to join a team investigating a family of seven tomato beta-galactosidase genes we have cloned from tomato with regard to their roles in fruit ontogeny. In particular, the associated enzymes are thought to be involved in various fruit ripening processes, including cell wall degradation leading to softening and chloroplast galactolipid degradation. The research associate will help in identification of their roles using gene knockout techniques, such as sense and antisense technology. The physiological and biochemical nature of the resulting phenotypes will then be analyzed. In addition, research will involve expression of the softening-related beta-galactosidase gene(s) in *ripening-inhibitor* and *never-ripe* tomato ripening mutants in order to help ascertain the function of the enzyme in the fruit softening process. A Ph.D. must have been received within the past four years in a field of plant science. Knowledge of plant physiology, biochemistry, and molecular biology techniques is required, and knowledge of enzymology and carbohydrate chemistry is desirable. A two-year appointment will be made at the GS-11 level, which includes a salary of $39,270 per year and a full benefits package. (Salary is projected to increase with January pay adjustment.) Certain

citizenship restrictions apply. Submit a letter discussing your qualifications, resume, copies of transcripts, and names of three references to Dr. Ken Gross, USDA/ARS, Bldg. 002, 10300 Baltimore Avenue, Beltsville, MD 20705-2350; telephone 301-504-6128, fax 301-504-5107, e-mail kgross@asrr.arsusda.gov.

Research Agronomist/Ecologist/Research Plant Pathologist
USDA/ARS, Beltsville, Maryland
(Received 12/21)
The U.S. Department of Agriculture, Agricultural Research Service (ARS), Beltsville Agricultural Research Center, Plant Sciences Institute, Weed Science Laboratory in Beltsville, Maryland, is seeking a research agronomist/ecologist/research plant pathologist, GS-471/408/434-12/13. Salary is commensurate with experience (GS-12: $48,796–$63,436 annually/GS-13: $58,027–$75,433 annually) plus benefits. Candidates must be U.S. citizens. Incumbent is responsible for an independent research program for understanding the mechanisms regulating weed population dynamics in different cropping systems. Research will focus on weed responses to chemical, cultural, or biological control practices at the population, physiological, or genetic level. Applicants must have appropriate qualifying education in agronomy, biology (ecology), or plant pathology or have professional research experience that provides (1) knowledge of agronomy, ecology, or plant pathology; (2) knowledge of plant population dynamics; (3) knowledge of cropping systems, cultural practices, and crop rotations; (4) knowledge of pest management strategies in sustainable or organic farming systems; and (5) ability to plan, conduct, and publish research. For program information, contact Dr. James D. Anderson at 301-504-6537. For complete application instructions, call 301-504-1484 to request vacancy announcement number ARS-S9E-9088, or print the announcement from the Internet at http://www.ars.usda.gov. All application materials must be postmarked by February 19, 1999. USDA/ARS is an equal opportunity employer and provider.

POSTDOCTORAL POSITIONS

Postdoctoral Positions
Connecticut Agricultural Experiment Station
New Haven
(Received 10/29)
Two postdoctoral positions are available for two years to study plant purine and pyrimidine transporters. One position involves cloning and analysis of soy bean nucleobase transporter genes via functional complementation of yeast mutations. The second position involves generating and characterizing Arabidopsis mutants deficient in nucleobase transporters. Applicants must hold a Ph.D. in biological sciences with experience in plant molecular biology or yeast manipulation. Send a curriculum vitae and names and addresses of three references to Dr. Neil Schultes, Department of Biochemistry & Genetics, The Connecticut Agricultural Experiment Station, 123 Huntington St., New Haven, CT 06511; e-mail neil.schultes@po.state.ct.us. Salaries are a minimum of $29,000 per year. The Connecticut Agricultural Experiment Station is an affirmative action/equal opportunity employer.

Postdoctoral Research Associate
University of Chicago, Chicago, Illinois
(Received 10/29)
A postdoctoral research associate position is available immediately to study the accumulation of economically valuable proteins in plastids. Emphasis will be on the sequestration of the cellulose degrading enzyme, cellulase. Both in vitro and in vivo approaches will be used. The applicant should have a strong background in molecular cell biology. Previous experience with transgenic plants would be beneficial, or training will be provided. Please send curriculum vitae, publications, and three letters of reference to Gayle Lamppa, Department of Molecular Genetics and Cell Biology, University of Chicago, 920 E. 58th St., Chicago IL 60637. The university is an equal opportunity employer.

Postdoctoral Position
University of California, Berkeley
(Received 11/12)
A postdoctoral position is available to study the function and regulation of protein tyrosine phosphatases in plants (Xu et al. [1998], Plant Cell **10,** 849; Luan [1998], Trends Plant Sci. **3,** 271; Gupta et al. [1998], Plant J. **16,** 581). Applicants with experience in molecular biology, biochemistry, or genetic approaches should contact Dr. Sheng Luan, Department of Plant and Microbial Biology, University of California, Berkeley, CA 94720; e-mail sluan@nature.berkeley.edu.

Postdoctoral Position
Washington State University, Pullman
(Received 11/17)
A postdoctoral position is available immediately for isolation of novel postharvest-related genes and their promoters from maize for targeting gene traits and products to non-crop portions. Research will involve construction of cDNA and genomic libraries, differential screening, and characterization of gene expression. Applicants must have a strong background in molecular biology. The position will start January 1, 1999, and funding is available for two years. Send a letter of application, curriculum vitae, and three letters of reference to Dr. Maurice Ku, Botany Department, Washington State University, Pullman, WA 99164-4238; telephone 509-335-0197, fax 509-335-3517, e-mail mku@wsunix.wsu.edu.

Postdoctoral Fellowship
Philip Morris U.S.A. Richmond, Virginia
(Received 11/20)
Philip Morris U.S.A. currently has postdoctoral fellowship positions available. A Ph.D. in plant physiology or biochemistry (or the equivalent) is necessary. The first fellowship is in plant stress physiology. The candidate will study the relationships between the imposition of pre-harvest stresses and the patterns of post-harvest modifications of nitrogenous compounds. We require documented research experience in the biochemistry and physiology of oxidative stress responses in plants and background analyzing stress-related chemical compounds and associated enzyme systems. Background working with the tobacco plant as an experimental subject and peer-reviewed publications in pertinent fields are pluses. The second fellowship is in plant nitrogen metabolism. We will depend on you to determine the fates of nitrate/nitrite ions in the tobacco leaf during senescence and post-harvest treatments. Candidate will focus on the activities of plant nitrate- and nitrite-reductases and related enzyme systems. We require documented research experience with enzymes in foliar tissues and extraction of those tissues. Determination of patterns of nitrogen metabolism in plants, including use of 15-N tracers, is essential. Publication of peer-reviewed documents in pertinent fields is a plus. Send resume to Philip Morris U.S.A., Human Resources, Department ASP0198, PO Box 26603, Richmond, VA 23261. EOE.

Postdoctoral Fellowship
Smithsonian Tropical Research Institute, Panama
Oklahoma State University, Stillwater
(Received 11/24)
A two-year Andrew W. Mellon Foundation postdoctoral fellowship is available April 1, 1999, to analyze the molecular evolution and ecological/physiological diversity of Crassulacean acid metabolism (see Plant Physiol., **113,** 667–676; 1997) using cDNA microarray technology. Demonstrated expertise in molecular genetics and plant biochemistry is required. Send letter outlining research experience and interests, curriculum vitae, and three letters of recommendation to Dr. John C. Cushman, Department of Biochemistry and Molecular Biology, Oklahoma State University, Stillwater, OK 74078; telephone 405-744-6207, fax 405-744-7799, e-mail jcushman@biochem.okstate.edu. For more information, visit our Web site at http://opbs.okstate.edu/~cushman/homepage.html.

Postdoctoral Position
University of Georgia, Athens
(Received 12/14)
A postdoctoral position is available to study water relations and ecophysiology of desert shrubs. Relevant experience includes plant–water relations at cellular and whole plant levels, soil water relations, plant adaptations to drought and salinity, field gas exchange, experimental design and analysis, and x-ray microanalysis. Experience with plant water relations techniques is essential. Review of applications will begin January 15, 1999, and continue until position is filled. Send inquires and applications (curriculum vitae, statement of research interests, names and phone numbers of references, and reprints) to Dr. Lisa Donovan, Botany Department, University of Georgia, Athens, GA 30602-7271; e-mail donovan@dogwood.botany.uga.edu. EEO/AA.

Postdoctoral Position
Michigan State University, East Lansing
(Received 12/16)
A postdoctoral position is available to study photoperiodic regulation of gibberellin metabolism in long-day rosette plants (Plant Physiol. **110,** 547–554; 1996 and **115,** 1471–1476; 1997). The work will include cloning and expression of gibberellin biosynthetic genes. Familiarity with the basic techniques of biochemistry and molecular biology, as well as plant transformation, is required. Send a letter of application outlining previous research experience and accomplishments and a curriculum vitae, and arrange to have three letters of reference sent, to Dr. Jan Zeevaart, MSU-DOE Plant Research Laboratory, Michigan State University, East Lansing, MI 48824; telephone 517-353-3230, fax 517-353-9168, e-mail zeevaart@pilot.msu.edu. MSU is an equal opportunity employer.

Research Associate/Postdoctoral Position
Waksman Institute, Rutgers University
Piscataway, New Jersey
(Received 12/18)
A position is available to study signal transduction during resistance responses in Arabidopsis and tobacco to microbial pathogens. The research will focus on the use of biochemical and genetic approaches to define components of salicylic acid– and nitric oxide–mediated signaling pathways (PNAS **95,** 7433, 10328; 1998). Extensive experience in protein purification or classic genetics is necessary. Appointment will be made at research associate or postdoctoral level depending on experience. Send curriculum vitae and cover letter detailing experience and have three letters of recommendation sent to Daniel Klessig, Waksman Institute, Rutgers University, 190 Frelinghuysen Road, Piscataway, NJ 08854. Rutgers University is an equal opportunity/affirmative action employer.

ASSISTANTSHIPS, FELLOWSHIPS, INTERNSHIPS, ETC.

Fellowship
Michigan Technological University
Houghton, Michigan
(Received 10/30)
A three-year Ph.D. fellowship is available immediately at Michigan Technological University to work on a multidisciplinary research program dealing with the effects of elevated CO_2 and ozone on forest tree species. Areas of research include biochemical and molecular studies of antioxidant mechanisms, plant–microbe–environment interactions, and tree physiology. The selected candidate will have a B.S. or an M.S. in a plant biology–related field with sufficient laboratory experience in biochemical and molecular techniques. Seleeted candidate is expected to spend the summers at the FACE site in Rhinelander, Wisconsin, for collection of samples and data. A Ph.D. can be pursued either in the Department of Biological Sciences or in the School of Forestry. Preference will be given to U.S. citizens and permanent residents. Send inquiries to Dr. G. K. Podila, Department of Biological Sciences, Michigan Technological University, Houghton, MI 49931; e-mail gkpodila@mtu.edu or Dr. D. F. Karnosky, School of Forestry, Michigan Technological University, Houghton, MI 49931; e-mail karnosky@mtu.edu.

Graduate Research Assistantships
University of Florida, Gainesville
University of Arizona, Tucson
Purdue University, West Lafayette
Michigan State University, East Lansing
New Mexico State University, Las Cruces
(Received 11/12)
Several research assistantships at the Ph.D. level are available from January 1, 1999, to participate in a unique interdisciplinary plant metabolic engineering project focused on one-carbon metabolism. The project is funded in part by NSF and other federal agencies and involves close collaboration among investigators at five universities: Andrew Hanson, Hans Bohnert, David Rhodes, Douglas Gage, and Yair Shachar-Hill. The project is oriented to graduate student training and involves the tools of molecular biology including DNA array technology, metabolic biochemistry, mass spectrometry and NMR analysis, and computer-assisted modeling of metabolism. Students will be based in one laboratory and will work for short periods in other laboratories of the network. Illustrative publications are Plant J. **16,** 101–110; Plant Physiol. **115,** 1211–1219; 1997, also visit http://www.hort.purdue.edu/cfpesp/models/models.htm for an overview of our modeling work. The basic annual stipends will be the customary ones at each institution but could be raised depending on qualifications or experience. Preference will be given to U.S. or Canadian students due to some of the funding sources. To apply, send a statement of research interests, curriculum vitae including graduate and/or undergraduate GPA, and the names, addresses, and phone numbers of three references to any of the group members (specialties in parentheses): Andrew Hanson (biochemistry, molecular biology), University of Florida, Horticultural Science Department, Gainesville, FL 32611-0690, telephone 352-392-1928, e-mail adha@gnv.ifas.ufl.edu; Hans Bohnert (biochemistry, molecular biology, DNA arrays), University of Arizona, Department of Biochemistry, Tucson, AZ 85722-3308, telephone 520-621-7961, e-mail bohnerth@u.arizona.edu; David Rhodes (biochemistry, computer modeling of metabolism), Purdue University, Horticulture Department, West Lafayette, IN 49707, telephone 765-494-1312, e-mail rhodes@hort.purdue.edu; Douglas Gage (protein biochemistry, mass spectrometry), Michigan State University, Department of Biochemistry, East Lansing, MI 48824-1312, telephone 517-353-4620, e-mail gage@pilot.msu.edu; Yair Shachar-Hill (metabolism, NMR), New Mexico State University, Department of Chemistry and Biochemistry, Las Cruces, NM 88003, telephone 505-646-3218, e-mail yairhill@nmsu.edu.

Graduate Research Assistantships
Louisiana State University, Baton Rouge
(Received 11/16)
Research assistantship positions to support graduate study leading to a Ph.D. in plant molecular biology will be available starting the fall semester of 1999 in the Department of Plant Pathology and Crop Physiology at Louisiana State University and LSU Agricultural Center. Particular areas of training emphasis include studies of gene regulation in transgenic rice, protein structure/stability relationships, and transcriptional regulation of bean and rice seed storage proteins. Please refer to our recent publications (Dyer et al. [1995], Protein Chem. **14,** 665–678; Kawagoe et al. [1994], Plant J. **5,** 885–890; Zheng et al. [1995], Plant Physiol. **109,** 777–786; Sen et al. [1993], Transgenic Research **2,** 21–28). Research assistantships are available from the Department of Plant Pathology and Crop Physiology. Other fellowships are available from the LSU Board of Regent's Graduate Fellowships in Agriculture and the LSU Alumni Federation Graduate Fellowships. Stipend ranges from $12,000 to $18,000 annually. Research facilities include state-of-art equipment for molecular and cellular biology, biochemistry, biophysics, and computation. Candidates should have a strong background in molecular biology, genetics, plant physiology, biochemistry, or related fields. Please submit a letter of interest, resume, undergraduate and graduate transcripts, and GRE/TOEFL scores and arrange to have three letters of reference sent to Dr. Norimoto Murai, Department of Plant Pathology and Crop Physiology, Louisiana State University and LSU Agricultural Center, Baton Rouge, LA 70803-1720; telephone 225-388-1380, fax 225-388-1415, e-mail nmurai@lsu.edu.

Graduate Research Assistantship
West Virginia University, Morgantown
(Received 12/03)
The Division of Plant & Soil Sciences at West Virginia University is seeking a qualified individual interested in obtaining an M.S. or a Ph.D. degree. The position is available beginning January 1999 (or until suitable candidate is available) and offers stipend and tuition waiver. The successful candidate is expected to conduct research on the physiological/molecular mechanism(s) of freezing injury or cold acclimation in plants. Studies will include plant–water relations, environmental stresses, photosynthesis, membrane isolation, analytical and preparative protein analysis, enzyme assays, nucleic acid isolation, and recombinant DNA techniques. Students with backgrounds in plant-related disciplines such as horticulture, botany, biology, or plant molecular genetics and interest in physiology, biochemistry, and molecular biology are encouraged to apply. Applicants with some prior training in research techniques listed above may be given preference. Stipends for Ph.D. and M.S. students are $11,040 and $9,396, respectively. Interested individuals should submit letter of application, a resume, college transcripts, GRE scores, TOEFL scores (foreign students), and three letters of reference. For more information contact Dr. Rajeev Arora, Division of Plant and Soil Sciences, PO Box 6108, Morgantown WV 26506-6108; telephone 304-293-6023, fax 304-293-2960, e-mail rarora@wvu.edu, or the division office at 304-293-4817.

Ph.D. Research Assistantship
Oklahoma State University, Stillwater
(Received 12/7)
A three-year, half-time, research assistantship is available to support investigations in genetic/physiological mechanisms of cold hardiness in grasses. The successful candidate will undertake thesis research and participate in collaborative research, seeking to identify, clone, and characterize cold-regulated genes in bermudagrass, *Cynodon dactylon*. The assistantship stipend is $15,180/year, with waiver of out-of-state tuition. Additional scholarship aid is available to research assistantships at OSU on a competitive basis. Excellent research facilities are available for this research, including the NSF-funded Recombinant DNA/Protein Facility and the Plant Transformation Facility in the Noble Research Center. Requirements for the position include an M.S. and molecular genetics experience. Expertise in agarose gel electrophoresis, gene cloning, cDNA library screening, DNA sequencing, Northern and Southern blotting, and PCR is desired. Interested parties should submit a concise letter outlining interests and qualifications to C. M. Taliaferro via e-mail at cmt@soilwater.agr.okstate.edu. This information must include a GRE score and, for international students, a TOEFL test score.

Graduate Research Assistantships
University of Florida, Gainesville
(Received 12/08)
Research assistantships are available through the University of Florida Interdepartmental Program in Plant Molecular and Cellular Biology (PMCB). Faculty are affiliated with the Departments of Agronomy, Botany, Environmental Horticulture, Forestry, Horticultural Sciences, Microbiology and Cell Science, and Plant Pathology. Entering Ph.D. or M.S. students participate in a six- to nine-month rotation program before selecting a permanent faculty adviser. Assistantships without rotation may also be available through direct application to PMCB faculty members. Faculty research interests include genome organization and mapping; chromatin structure; gene structure and regulation; responses to environmental stress; organelle genetics and biogenesis; genetic basis of development; cell culture, regeneration, and transformation; and plant–microbe interactions. For information, including a list of participating faculty and their research interests, contact Dr. L. Curt Hannah, Graduate Coordinator, PMCB Program, c/o Horticultural Sciences Department, PO Box 110690, University of Florida, Gainesville, FL 32611-0690; telephone 352-392-1928, ext. 315, e-mail pmcb@gnv.ifas.ufl.edu, Web site http://www.ifas.ufl.edu/~PMCB/index.htm.

Graduate Assistant
University of Saskatchewan, Canada
(Repeat)
Contact Dr. Ridong Chen, Department of Biochemistry, University of Saskatchewan, 107 Wiggins Road, Saskatoon, SK S7N 5E5, Canada; telephone 306-966-4364, fax 306-966-4390, e-mail chenr@duke.usask.ca. (Details November/December 1998 *ASPP NEWS)*

Undergraduate Internships in
Plant Molecular and Cellular Biology
University of Florida, Gainesville
(Repeat)
For information and an application packet, contact Dr. L. Curt Hannah, Graduate Coordinator, PMCB Program, c/o Horticultural Sciences Department, PO Box 110690, University of Florida, Gainesville, FL 32611-0690; telephone 352-392-1928 ext. 315, e-mail PMCB@gnv.ifas.ufl.edu. (Details November/December 1998 *ASPP NEWS)*

Graduate Research Fellowships
Oregon State University, Corvallis
(Repeat)
For information contact Dr. Machteld Mok, Department of Horticulture, Oregon State University, ALS 4017, Corvallis, OR 97331-7304; e-mail mokm@bcc.orst.edu, Web site http://www.orst.edu/dept/hort/grad. (Details November/December 1998 *ASPP NEWS)*

Graduate Assistantships
University of Florida, Gainesville
(Repeat)
For information contact Dr. D. J. Huber, Graduate Coordinator, Horticultural Sciences Department, PO Box 110690, University of Florida, Gainesville, FL 32611-0690; telephone 352-392-1928 ext. 216, e-mail rego@gnv.ifas.ufl.edu. Please refer to position number 1114. The University of Florida is an equal opportunity employer. (Details November/December 1998 *ASPP NEWS)*

Postdoctoral Researcher
The Ohio State University, Wooster
(Repeat)
Contact Dr. Peg Redinbaugh, Department of Plant Pathology, OARDC, 1680 Madison Ave., Wooster, OH 44691; fax 330-263-3841, e-mail redinbaugh.2@osu.edu. (Details November/December 1998 *ASPP NEWS)*

Graduate Research Assistantship
North Carolina State University, Raleigh
(Repeat)
For information contact Dr. Mason Pharr at 919-515-1217, e-mail mason_pharr@ncsu.edu, or Dr. John D. Williamson at 919-515-5366, e-mail john_williamson@ncsu.edu. For a review on our work, see Stoop, Williamson & Pharr (1996), Trends in Plant Science **1**, 139–144. (Details November/December 1998 *ASPP NEWS)*

Graduate Assistantship
University of Florida, Gainesville
(Repeat)
For information, please contact Daniel J. Cantliffe, Professor and Chair, University of Florida, IFAS, Horticultural Sciences Department, 1251 Fifield Hall, PO Box 110690, Gainesville, FL 32611-0690; telephone 352-392-1928 ext. 203, fax 352-392-6479, e-mail djc@gnv.ifas.ufl.edu. (Details November/December 1998 *ASPP NEWS)*

Graduate Fellowships in Plant Biotechnology
Worcester Polytechnic Institute
Worcester, Massachusetts
(Repeat)
For information and an application packet, contact Professor Pam Weathers, Department of Biology and Biotechnology, Worcester Polytechnic Institute, 100 Institute Rd., Worcester, MA 01609; telephone 508-831-5196, fax 508-831-5196, e-mail weathers@wpi.edu. (Details November/December 1998 *ASPP NEWS)*

ASPP Headquarters Telephone Extensions and E-Mail Directory

For your convenience, keep this listing of extension numbers and e-mail addresses handy when you contact ASPP headquarters so that you can reach the person best able to assist you.

Our office telephone number is 301-251-0560

	John Lisack, Jr., / ext. 15 jlisack@aspp.org	Nancy Winchester / ext. 17 nancyw@aspp.org	Susan Chambers / ext. 11 chambers@aspp.org	Kelley Noone / ext. 53 knoone@aspp.org	Sondra Giancoli / ext. 51 giancoli@aspp.org	Crispin B. Taylor / ext. 21 ctaylor@aspp.org	Brian Hyps / ext. 14 bhyps@aspp.org	Annette Kessler / ext. 20 akessler@aspp.org	Kelley Noone / ext. 53 knoone@aspp.org	Deborah Weiner / ext. 18 dweiner@aspp.org
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