

ASPP NEWS

PRESIDENT'S LETTER

Annual Meeting Changes

As I begin my term as president of ASPP, I look forward to the coming year with a mixture of apprehension and optimism. My apprehension derives from the fact that ASPP is in the midst of several important initiatives for which the outcomes are uncertain. My optimism derives from the recognition that, if successful, these initiatives will enhance the ability of our society to serve both its members and the whole plant biology community. Two specific examples, which I will not discuss here, are the transition to electronic publishing of our journals and the full implementation of the recently formed ASPP Education Foundation. These initiatives have been discussed by previous presidents, and I will certainly discuss them again during the coming year. Another example, which I will discuss in more detail below, is the continuing changes in the format of our annual meeting.

The changes in our annual meeting will be evident as you examine the call for abstracts contained in this issue of the Newsletter. Don Ort alerted the membership to the impending changes in the July/August issue of the Newsletter. However, the consequences of the changes take on a new reality as members prepare their abstracts and make their plans to attend the annual meeting; therefore, I have decided that the topic deserves further consideration. The first change that members will notice is that the meeting date has been moved forward one month from our normal time near the end of July. This temporary change was made to accommodate our decision to interface our meeting with that of the Arabidopsis group. The Arabidopsis group, which will hold its 1998 meeting on the

University of Wisconsin campus, will continue its tradition of meeting from Wednesday to Sunday noon. ASPP will continue its tradition of meeting Saturday afternoon through Wednesday. These schedules will provide two days of overlap on Saturday, June 27 and Sunday, June 28. We have also invited the Arabidopsis group to attend our Saturday evening mixer. All of the joint sessions will be held at our meeting site, the newly constructed Monona Terrace Convention Center (see the July/August issue of the Newsletter for details). People who register for the ASPP meetings will be able to attend the Saturday morning scientific sessions of the Arabidopsis group at no additional charge. These sessions will be held in the Memorial Union Theater on the University of Wisconsin campus. Similarly, those who have registered for the Arabidopsis meeting will be able to attend the Sunday afternoon ASPP sessions at no additional charge. Those who want to attend more of the other meeting will need to register for both.

Another significant change is the program committee's decision to move to an all-poster format. The 1998 annual meeting will not offer the traditional oral platform sessions. In the July/August issue of the Newsletter, Don Ort asked members for their suggestions on how best to use the time that was previously devoted to oral platform sessions. In response to one member's suggestion, the program committee decided to significantly expand the number of minisymposia and to select speakers for these minisymposia from the abstracts submitted for the poster sessions. Twenty-four minisymposia will be held in 1998: six

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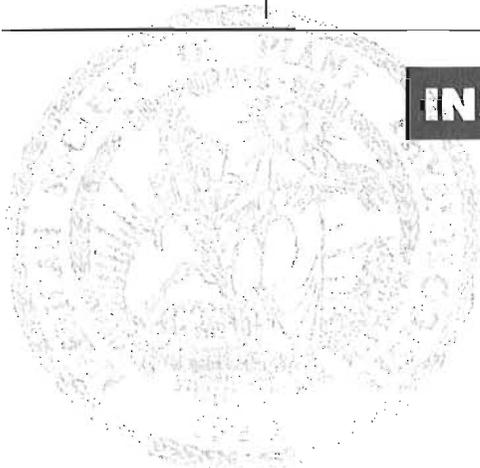




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**Deadline for
January/February 1998 ASPP NEWS:
January 05, 1998**

Future ASPP Annual Meetings

1998

Saturday, June 27, through
Wednesday, July 1

Madison, Wisconsin

Meeting to overlap with the
meeting of the 9th
International Conference on
Arabidopsis Research

1999

Saturday, July 24, through
Wednesday, July 28

Washington, D.C.

ASPP's 75th anniversary
meeting



ASPP NEWS

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each afternoon on Sunday, Monday, and Tuesday, and six on Wednesday morning. The plan is that the topics for minisymposia will change from year to year, so that all topics are covered on some type of rotation. After much discussion, the program committee chose topics for 20 of the minisymposia; these topics are listed with the call for abstracts. In addition, for those whose research does not fit into one of the announced topics, the program committee is requesting that members suggest four additional topics for 1998. These four topics will be chosen once the program committee

has seen the list of possibilities and has reviewed the quality and quantity of abstracts that would fit into these topics. The program committee hopes that the prospect of participating in a particular minisymposium will encourage people to submit abstracts on the announced topics or to suggest topics when their favorite is not on the list.

Finally, I want to emphasize that the goal driving the experimental changes described above is to enhance the value of the annual meeting for a larger portion of our members. Because not all members have the same expectations of the annual meeting, efforts to enhance its value for some may decrease

its value for others. Regardless of how you perceive the proposed changes, we value your opinions. The program committee plans to employ several mechanisms to obtain member opinion both during and after the 1998 meeting. In addition, I welcome your comments and suggestions before, during, or after the meeting.

Ken Keegstra
ASPP President, 1997-1998
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LETTER TO THE EDITOR



Colleagues:

I would like to comment on the article by Donald Ort on the origins of the Education Foundation [ASPP NEWS, Volume 24, Number 2, 1997]. The Foundation is a fine enterprise with laudable aims which I warmly endorse. However, I suggest that the origins were actually far earlier than stated, and that the determination of the ASPP to foster efforts to educate the public and to support those who teach plant physiology have gone through an evolutionary process which started in the early 1980's, and only recently has culminated in the Education Foundation.

When the annual meeting was held at Davis, California, in 1984, I remember feeling excluded and very uncomfortable because I had no research to present. I teach at a large state university (San Jose State) where the teaching loads are heavy and research opportunities scant. I made a practice of attending annual meetings in order to keep up on the latest research, but found absolutely no way to participate. Moreover, I had just completed a winter as a Visiting Scholar for Phi Beta Kappa, during which I had visited eight small liberal arts colleges. On these campuses I found marvelous science teachers, usually immensely dedicated, hardworking and versatile. Graduates of these colleges contribute disproportionately to high achievers in science. Yet I had found that these superior teachers were apologetic about their lack of research, and seldom had any support to attend scientific meetings, those of ASPP or others, because they could not present papers.

I voiced these thoughts to my good friend Marty Gibbs as we strolled across the Davis

campus. Marty challenged me to "do something about" the lack of opportunity for those plant physiologists whose main occupation was teaching to participate in the society's activities. Soon after this, Bob Rabson brought a small group together in Denver to consider how the ASPP might be involved in teaching our discipline. Thus, Gibbs, Rabson, and I should be considered as the progenitors of the commitment of the ASPP to education.

The next year, at the annual meeting at Brown University, we scheduled a round table discussion among the authors of several plant physiology textbooks. It was a late addendum to the program, held late (8:30 p.m., I think), which took place at a distant site on a rainy evening. These authors had surely never publicly discussed with each other their books, and there was considerable lively interchange. At least 100 people attended, and there was almost 100% consensus among them that the following year's meeting should have some session devoted to the task of teaching plant physiology. It was clear that there was a constituency for recognizing the importance of those who contribute to the education both of researchers and of those who simply should be literate about the plant sciences, and that these activities were a legitimate concern of the ASPP.

My memory does not allow me to detail the developments which followed; however, these events were among them. Mel Josephs was strongly supportive, along with Rabson and Gibbs, and facilitated our wishes. An ad hoc Education Committee was approved, chaired the first year by Mary Helen Goldsmith, thereafter (until 1991) by me. Paul Williams put on a workshop on teaching plant physiology with "Fast Plants,"

brassicas with very short life cycles. We had a "Teaching Booth" at the annual meetings, wherein were displayed various good ideas and ideas for teaching. There started a "Teaching Corner" in the Newsletter as a regular feature. We established an award for "Outstanding Teacher" — not without an initial embarrassing veto by the Executive Committee of the ASPP, who said they didn't know how they would select a winner. (The Education Committee was prepared to carry out that chore, and Marty Gibbs had already secured a commitment for funding the award.) Paul Williams was the first recipient of the teaching award, which we intended to carry as much honor as any other ASPP award. (Some cynics suggested that such an award was a "kiss of death" for retention, promotion, or tenure!)

There were dedicated, dependable, creative, hardworking people who helped bring the ASPP to an awareness of the importance of teaching; I think appreciatively of Ethel Kamien, Don Geiger, Susan Singer, John Greenler, and Paul Williams and beg the forgiveness of others who contributed but whom I have failed to mention. The main point is that the ASPP has traveled from an attitude of essentially ignoring the contributions of those whose primary role is teaching in the early 1980's to one of encouraging and supporting them in the period of 1984 to the present. The establishment of the Education Foundation is surely a satisfying culmination to all of those who contributed. Please recognize those who helped our society travel this path.

Very truly yours,

Ellen C. Weaver
San Jose State University

Call for Nominations for Officers and Awards

The annual call for nominations for officers and awards will be mailed to all ASPP members on January 2, 1998. Nominations for officers are due at headquarters by February 13, 1998; those for awards are due at headquarters by March 6, 1998.

ASPP members will be nominating for the offices of president-elect (succeeding Brian A. Larkins) and elected member of the ASPP Executive Committee (succeeding Wendy Boss). The president-elect will serve under that title in 1998–1999, as president in 1999–2000, and as immediate past president in 2000–2001. The elected member will serve on the ASPP Executive Committee for three years, 1998–2001.

Awards to be presented in 1998 include: the Stephen Hales Prize, the Charles Reid

Barnes Life Membership Award, the Charles F. Kettering Award, the Adolphe E. Gude, Jr. Award, the Excellence in Teaching Award, and Corresponding Membership. The nominating ballot explains the qualifications for each of the awards and the procedure to be followed to submit a nomination. Awardees will be selected from among nominees by the appropriate awards committees. Awards will be presented at a ceremony during Plant Biology '98, ASPP's annual meeting in Madison, Wisconsin.

Members are urged to participate in the nominating process. If you do not receive your ballot, please contact Sharon Kelly Mulheron at ASPP headquarters (telephone 301-251-0560, ext. 29; fax 301-279-2996; or e-mail skelly@aspp.org).

PUBLICATIONS DIRECTOR HIRED

The critical vacancy in the position of publications director has been filled; Nancy Winchester will assume this post beginning December 1. In announcing the appointment, Executive Director Ken Beam said, "As the Society moves into electronic publishing and expanding our book publishing program, we are very fortunate to have such an experienced and energetic individual to fill this very important position."

Nancy comes to ASPP from the National Association of Social Workers (NASW), where she was director of publications. At NASW, she oversaw four peer-reviewed journals and an aggressive book publishing department that produced 10–12 titles per year. She was previously the editor in the book department at the National Academy of Sciences Press, where she managed an average of 20 books per year. She also has experience with a commercial publisher and started out her career as an editor at the American Physiological Society. She has a BS in zoology from the University of Maryland and an MBA from Boston University.

Ms. Winchester's primary objectives as she begins work at ASPP include management of such projects as the publication of the textbook *Biochemistry and Molecular Biology of Plants*, the creation of the electronic versions of the two Society journals planned to begin in February 1998, and supervision of all of the other ASPP publication projects, including the production of this newsletter.

Nancy will be filling the vacancy created by the departure of Susan Wantland. As was reported in the last issue of this newsletter, Susan was diagnosed in early September with a terminal brain tumor; she passed away on Sunday, October 26.



Nancy A. Winchester, Publications director.

Watch for ASPP Journals Online



Full-text electronic versions of

Plant Physiology

and

THE PLANT CELL

will be available in early 1998.



Working with Stanford

University's HighWire Press,

ASPP will offer subscribers

- ◆ highly browsable formats
- ◆ interarticle links
- ◆ interjournal links
- ◆ graphics at three levels of detail
- ◆ downloadable files
- ◆ online reader help



ASPP Officers Assume Posts for 1997 – 1998

October 1 was the date on which new ASPP officers and committee members began their responsibilities. Kenneth Keegstra, MSU-DOE Plant Research Laboratory, Michigan State University, became president; Brian Larkins, University of Arizona, became president-elect; Donald R. Ort, USDA/ARS, University of Illinois, became immediate past president, and Joe Chappell, University of Kentucky, became an elected member of the Executive Committee. Other changes on the Executive Committee include: Terri Lomax, Oregon State University became treasurer; Judy Callis, University of California – Davis, chair of the publications committee; Hector Flores, Pennsylvania State University, chair of the minority affairs committee; and Alison Roberts, University of Rhode Island, Northeastern Section representative.

Following is a list of the membership of ASPP's committees for 1997 – 1998, as announced by President Ken Keegstra:

BOARD OF TRUSTEES

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Russell L. Jones (98)
Mary Helen Goldsmith (00)
Terri Lomax (99), treasurer and ex officio

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Mary A. Schuler (98)
David J. Longstreth (00)
Pamela J. Green (01)
Robert L. Last (02)

PROGRAM COMMITTEE

Mary Jo Vesper (99), Chair
Judith A. Verbeke (98)
Kenneth Keegstra (98), ex officio, president
Donald R. Ort (99)
Michael E. Salvucci (99)
Roger Hangarter (00)
Danny J. Schnell (01)

NOMINATING COMMITTEE

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Kenneth Keegstra (99), ex officio, president
Brian A. Larkins (00), ex officio, president-elect

EDUCATION COMMITTEE

John P. Markwell (99), Chair
Dina Mandoli (98)
Robert R. Wise (98)
H. Carol Reiss (00)
Paul H. Williams (01)

CONSTITUTION & BYLAWS COMMITTEE

Phillip D. Reid (98), Chair
William H. Outlaw, Jr. (99)
Subhash C. Minocha (00)

COMMITTEE ON THE STATUS OF WOMEN IN PLANT PHYSIOLOGY

Ruth Alscher (98), Chair
Sabine Heinhorst (98)
Elizabeth E. Hood (99)
Cynthia A. Henson (99)
Dean Della Penna (00)
C. Robertson McClung (00)

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Robert B. Horsch (98)
Ralph S. Quatrano (98)
Elisabeth Gantt (99)
James N. Siedow (00)
R. James Cook (00)
Dawn S. Luthé (01)
Peggy G. Lemaux (01)
Donald R. Ort, ex officio, past president

MEMBERSHIP COMMITTEE

APPOINTED

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Mary A. Bisson (98)
Anton A. Sanderfoot (00)

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Daniel R. Bush (98), Midwestern
Jerry D. Cohen (98), Washington, D.C.
Marc A. Cohn (99), Southern
Sharman D. O'Neill (98), Western
Alison W. Roberts (00), Northeastern

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Ken Poff (98)
Robert Jones (99)
Tuan-Hua David Ho (00)
Robert Louis Vellanoweth (00)

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Louise E. Anderson (99), Chair
Gloria Muday (98)
Neil R. Baker (00)
Lawrence R. Griffing (01)

CHARLES REID BARNES LIFE MEMBERSHIP

Louise E. Anderson (99), Chair
Robert Mullen (98)
Kenneth Kline (00)
James H.M. Henderson (98), past winner

STEPHEN HALES PRIZE

Maarten J. Chrispeels (98), Chair, past winner
Joe Key (99)
Charles A. West (01)
Mary Kay Walker-Simmons (03)

CHARLES F. KETTERING AWARD

Richard Malkin (99), Chair
Donald A. Bryant (01)
Steven M. Theg (03)
William A. Cramer (98), past winner

CHARLES ALBERT SHULL AWARD

William F. Thompson (98), Chair
Wendy K. Silk (00)
John Whitmarsh (02)
Julian I. Schroeder (99), past winner

MARTIN GIBBS MEDAL

Sarah M. Assmann (98), Chair
Kenneth Keegstra (00)
Heven Sze (02)
William J. Lucas (99), past winner

ADOLPHE E. GUDE, JR. AWARD

Michael L. Evans (00), Chair
Howard Grimes (03)
Deborah Delmer (06)
Eli Romanoff (98), past winner

DENNIS R. HOAGLAND AWARD

Lawrence Rappaport (03), Chair
Rebecca S. Boston (99)
Thomas D. Sharkey (05)
Brian A. Larkins (00), past winner

EXCELLENCE IN TEACHING AWARD

Mark R. Brodl (02), Chair
David Dalton (99)
John M. Cheeseman (05)
Carl S. Pike (98), past winner

**NATIONAL RESEARCH COUNCIL
ASSOCIATESHIP PROGRAMS**

APPLICATIONS SOUGHT FOR POSTDOCTORAL AND SENIOR RESEARCH ASSOCIATESHIPS

November 1997

The National Research Council announces the 1998 Postdoctoral and Senior Research Associateship Programs to be conducted on behalf of over 120 research laboratories throughout the United States representing nearly all U.S. Government agencies with research facilities. The programs provide opportunities for Ph.D. scientists and engineers of unusual promise and ability to perform research on problems largely of their own choosing yet compatible with the research interests of the sponsoring laboratory. Initiated in 1954, the Associateship Programs have contributed to the career development of over 8000 scientists ranging from recent Ph.D. recipients to distinguished senior scientists.

Approximately 350 new full-time Associateships will be awarded on a competitive basis in 1998 for research in: chemistry; earth and atmospheric sciences; engineering, applied sciences, and computer science; life, medical, and behavioral sciences; mathematics; space and planetary sciences; and physics. Most of the programs are open to both U.S. and non-U.S. nationals, and to both recent doctoral recipients and senior investigators.

Awards are made for one or two years, renewable for a maximum of three years; senior applicants who have held the doctorate at least five years may request shorter periods. Annual stipends for recent Ph.D.s for the 1998 program year range from \$30,000 to \$47,000 depending upon the sponsoring laboratory, and will be appropriately higher for senior award recipients.

Financial support is provided for allowable relocation expenses and for limited professional travel during the duration of the award. The host laboratory provides the Associate with programmatic assistance including facilities, support services, necessary equipment, and travel necessary for the conduct of the approved research program.

Applications submitted directly to the National Research Council are accepted on a continuous basis throughout the year. Those postmarked no later than January 15 will be reviewed in February, by April 15 in June, and by August 15 in October. Initial awards will be announced in March and April — July and November for the two later competitions — followed by awards to alternate candidates later.

Information on specific research opportunities and participating federal laboratories, as well as application materials, may be obtained from the:

National Research Council
Associateship Programs (TJ 2114/D3)
2101 Constitution Avenue, NW
Washington, DC 20418
Fax: (202) 334-2759; Email: rap@nas.edu

Information also on Internet at: <http://www.nas.edu/rap/welcome.html>

DEADLINES FOR APPLICATION: JANUARY 15, APRIL 15 AND AUGUST 15, 1998

Qualified Applicants will be reviewed without regard to race, creed, color, agent sex or national origin.

RALPH QUATRANO NAMED TO LEAD THE PLANT CELL

The ASPP Executive Committee has named Ralph S. Quatrano to a five-year term as editor of *THE PLANT CELL*. The appointment, which runs from July 1, 1998, through June 30, 2003, was approved by the Executive Committee at its August meeting in Vancouver, British Columbia, on the recommendation of the Publications Committee. Quatrano is the John N. Couch Professor of Biology at the University of North Carolina, Chapel Hill, and a member of the Curriculum in Molecular Biology and Genetics.

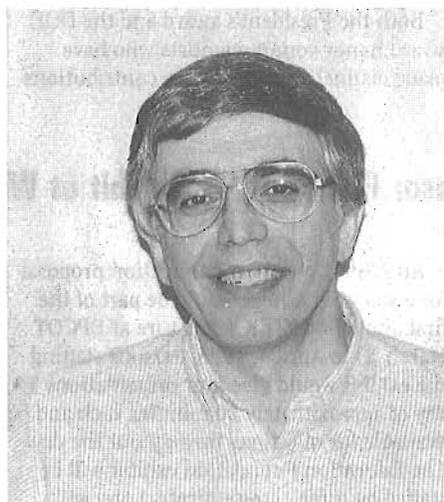
Quatrano says that he is "honored by the appointment" and that he will "work to maintain the journal's prominence in plant science, to further increase the speed with which articles are published, and to improve its unique features — the special issues and the news and reviews section." He will also "strive to increase the number of articles published in the areas of plant cell and developmental biology."

Quatrano has published widely in several research areas including the regulation of cell polarity and gene expression during plant embryogenesis. His broad research interests and his familiarity with molecular, cellular, and genetic approaches to the study of developmental questions relevant to both plants and other eukaryotes qualify him uniquely to provide visionary leadership during the next phase of *THE PLANT CELL*'s evolution.

Quatrano will become the third editor to lead *THE PLANT CELL*, succeeding Robert B. Goldberg (1989–1993) and Brian A. Larkins (1993–1998). He has been an active participant during the journal's formative years, serving as both coeditor and associate editor (1989–1995). In addition to his affiliation with *THE PLANT CELL*, Quatrano has a long history of service to ASPP as a member of the Executive Committee (1991–1994) and as president (1992–1993). During his presidency, Quatrano was instrumental in establishing both the Public Affairs Department and Public Affairs Committee; he also served as the first chair of the Public Affairs Committee (1994–1997).

At the University of North Carolina, Quatrano was chair of the Department of Biology from 1992–1997. Prior to his move to North Carolina in 1989, he was Research Manager Molecular Biology, Central Research Department at Du Pont Company (Wilmington, DE) for three years, and before that, he was at Oregon State University, Corvallis, for 18 years. At Oregon State University, he served as director of the Center for Gene Research and Biotechnology (1984–1986), professor of botany (1978–1986), and assistant and associate professor of botany (1968–1978).

Quatrano is an honors graduate of Colgate University (Hamilton, NY), where he received an A.B. in botany. He received an M.S. in botany from Ohio University (Athens) and a Ph.D. in biology from Yale University (New Haven, CT). In 1989, Ohio University honored him with a Distinguished Alumni Award. At Oregon State University, he received two teaching awards, the Carter Award for Outstanding Undergraduate Teacher, College of Science (1970–1971), and the Elizabeth P. Richie Distinguished Professor Award (1979).



Ralph Quatrano will become editor of *THE PLANT CELL* on July 1, 1998.

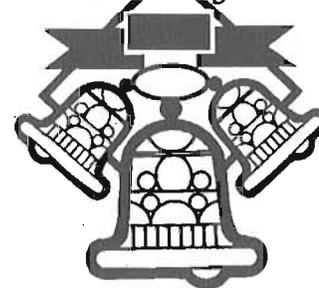
SECTION NEWS

Southern Section

Arrangements for our annual meeting are well underway. The meeting will be held in the historic Hotel Roanoke and Conference Center in Roanoke, Virginia, from March 21–23. The Center was built in 1882. This Blue Ridge Mountain site will provide an inspiring backdrop to an exciting scientific program that is designed to feature not only top researchers in the Southern section but also our up and coming students.

Our annual symposium is entitled "The Biology of the Plant Cell Wall" and features Dan Cosgrove, Michael Hahn, and Wolf-Dieter Reiter. Participants in our graduate student "Best Paper" and undergraduate poster "Best Poster" competitions will receive free registration and banquet tickets. Winners will receive a framed certificate and a cash award. For those of you who are mentors, this is an excellent opportunity to give your students valuable experience in presenting their research in a professional setting without the heavy pressure of the national annual meeting. It also gives them a chance to meet your colleagues and make valuable lasting contacts within the field. Don't deny them the opportunity! For those of you who have budgetary restraints, the regional meetings are usually close enough to drive to and registration is inexpensive. This is a very cost effective use of your dwindling budgets. If you are in the area, we would love to see you. Please come and participate in the grass roots of our society. For more information, contact Melvin Oliver at 806-746-5353 or e-mail moliver@mail.csrl.ars.usda.gov

Season's Greetings



JOHN SHANKLIN RECEIVES U.S. PRESIDENTIAL AWARD AND DOE AWARD

ASPP member John Shanklin received the Presidential Early Career Award for Scientists and Engineers (PECASE) November 3 at a ceremony at the White House. This award is the highest award bestowed by the U.S. government on outstanding scientists and engineers beginning their careers and recognizes the research contributions of young scholars, their promise and their commitment to broader societal goals.

"These gifted young professionals exemplify the best of our science and technology community and will help set the scientific pace for the U.S. and the world in the years ahead," the President said.

Representatives from 10 government agencies join together annually to nominate promising scientists and engineers for the award. Those selected receive up to \$500,000 over a five-year period to further their research and advance science for important government missions. The supporting agencies are the Departments of Agriculture, Commerce, Defense, Energy, Health and Human Services, Transportation, and Veterans' Affairs, and the Environmental Protection Agency, the National Aeronautics and Space Administration, and the National Science Foundation.

Dr. Shanklin also received the Department of Energy (DOE) Office of Energy Research Young Scientist Award, saluting five young

scientists for their extraordinary scientific and technical achievement. Each recipient met demanding scientific and technical challenges with great leadership, knowledge and insight. Dr. Shanklin received this award "in recognition of his internationally acclaimed research on the structure and function of a class of enzymes (desaturases and hydroxylases) that introduce double bonds or hydroxyl groups at specific sites between pairs of carbon atoms in long-chain fatty acids."

His research paves the way for new techniques to make chemicals from plants instead of petroleum products. As a result of his work with plant hydrocarbons, those working in the chemical industry are much closer to the goal of introducing these engineered enzymes (desaturases and hydroxylases) into crops for commercial production of compounds that can be used as starting materials for products now obtained from petroleum.

Dr. Shanklin received a Ph.D. in horticulture from the University of Wisconsin-Madison, and holds an M.Sc in forestry from the University of Wisconsin-Madison and a B.Sc. in biology from the University of Lancaster in England.

Both the President's award and the DOE award honor young scientists who have made distinctive and creative contributions

as independent investigators and as team members. President Clinton commented, "Their passion for discovery and their determination to explore new scientific frontiers will drive this Nation forward and build a better America for the twenty-first century."



John Shanklin, U.S. Presidential Award winner.

ASPP Education Foundation to Sponsor Plant Science Exhibit at Walt Disney World Epcot Center

The ASPP Education Foundation Board chaired by Dick Laster recently approved sponsorship of a plant science exhibit at the EPCOT Center of Walt Disney World next Spring. The Foundation Board is working with the ASPP Education Committee and Disney officials to develop the exhibit.

A proposed theme for the Foundation exhibit is "Plants for the 21st Century." The exhibit would focus on plant research, especially plants enhanced using biotechnology. The exhibit will feature research using plant biotechnology which contributes to:

- Gains in crop production to meet world needs for food.
- Enhanced nutritional content of food.
- Plant-derived pharmaceutical products.

Dale Blevins of the University of Missouri first proposed the exhibit when he was chair of the Education Committee. John Markwell of the University of Nebraska is now coordinating the project with Disney officials, having become chair of the Education Committee in October.

An ASPP Education Foundation proposal for a sidewalk exhibit would be part of the first annual SCI/TEK Adventure at EPCOT March 13 to April 4, 1998. Persons staffing the exhibit would give four presentations a day of approximately 20 minutes each and be available for questions throughout the day. The Education Foundation exhibit will be staffed by three communicators and will include plots of land for growing engineered plants. The plant science exhibit may also run an additional six weeks at the Flower & Garden Festival at Epcot.

The SCI/TEK Adventure exhibit would be similar in a number of ways to the EPCOT International Flower & Garden Festival, Gardening for Food around the World science exhibits held earlier this year. A total of more than 50,000 guests interacted one on one with science exhibitors at the Flower & Garden Festival, Gardening for Food around the World science exhibits. More than 35,000 guests participated in 20-minute presentations given at the science exhibits.

More than 10 million people visit EPCOT in a year and travel the walkways. Of the more than 10 million guests, 22% are from outside the U.S. Of this 22% of international guests, 52% come from Europe; 19% come from South America, especially from Brazil and Argentina; and 13% come from Canada.

ASPP President Ken Keegstra, a member of the Foundation Board, expressed his appreciation to corporate members of the Foundation Board and to ASPP members who contribute to the Foundation for making this exhibit possible. Further developments with the ASPP Education Foundation-sponsored EPCOT exhibit will be reported in future issues of *ASPP NEWS*.



Sen. Bond Maps Way to \$40 Million for Plant Genome Research

Sen. Christopher Bond (R-MO) and his colleagues in the 105th Congress passed Fiscal Year 1998 spending legislation that the President signed into law on October 27 which calls for \$40 million in new funds for the National Science Foundation (NSF) to support plant genome research.

The decision by Sen. Bond and Congress to provide new funds for a plant genome initiative will allow NSF to increase efforts in plant genome research without taking funds away from important existing programs. As chairman of the Senate Appropriations Subcommittee on Veterans Affairs, Housing and Urban Development, and Independent Agencies (including NSF) and sponsor of the plant genome proposal, Sen. Bond was the leading member of Congress on this issue.

Bond improved upon an earlier proposal corn growers made for corn genome research by calling, instead, for a plant genome research proposal supported by the White House-appointed Interagency Working Group and the plant science community, including ASPP. To avert setbacks to existing research programs, Bond and his colleagues dug deeper into the allocation for his subcommittee to provide \$40 million in new funds to support the plant genome initiative.

NSF Director Neal Lane has expressed his support for the plant genome initiative in his following statement on the Conference Agreement containing the provision:

"The agreement directs NSF to invest a total of \$60 million [includes \$20 million existing] in plant genome research in concert with work being done by other federal agencies. NSF is anxious to move quickly on this effort and to work in partnership with both public and private entities to support the highest quality research in this important area."

ASPP campus contacts across the nation were active in support of new funds for plant genome research. ASPP members at the University of Missouri worked closely with Sen. Bond's office. There was a mailing to Bond from many ASPP members from the University of Missouri, interaction with the University administration on this issue, and an individual meeting by an ASPP member with Sen. Bond, himself. The ASPP Public Affairs office was also in contact with Sen. Bond's personal staff, his appropriations committee staff, White House science staff, and others.

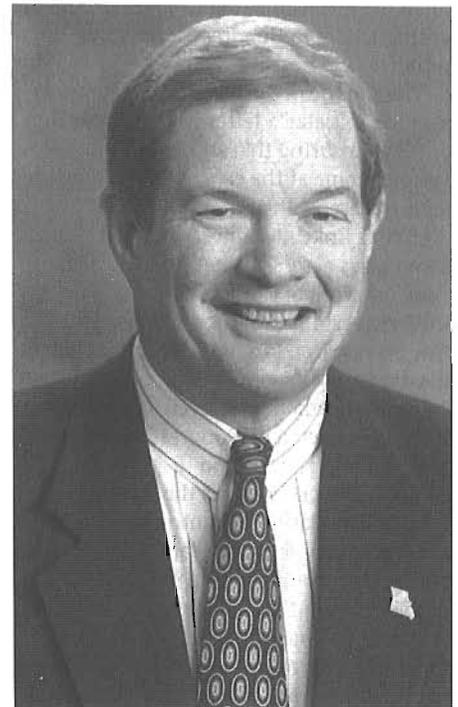
ASPP Board of Trustees Chair and charter member of the Committee on Public Affairs Doug Randall of the University of Missouri, who met with Sen. Bond on the plant genome issue, commended the work of the Senator in reaching out to The White House and the plant science community in refining the proposal. "Kit Bond supported a highly regarded research proposal when he was Governor of Missouri with the Food for the 21st Century Initiative. Now he is moving plant genomics research a big step forward by championing the plant genome initiative," Randall said.

Committee on Public Affairs Chair Lou Sherman said the long-term effect of this initiative for growers and consumers should be substantial in terms of increased gains in grain production, more rapid development of plants that can be grown under conditions that are better for the environment, engineering of plants that will help conserve fresh water supplies, and a wide range of benefits outside of agriculture such as discoveries of new plant-derived medicines. "In addition," he said, "the initiative will lead to the improvement of germplasm of native crops which will benefit subsistence agriculture in developing countries."

"The Congress is giving us the means to help provide a better future," ASPP President Ken Keegstra remarked. "The new knowledge of plant genomes, as well as our enhanced ability to manipulate them, will help the world's growing population by providing novel sources of food, fiber, fuel, and pharmaceuticals."

Committee on Public Affairs members Ralph Quatrano and Rob Horsch are participating on a panel which is advising NSF on the plant genome initiative. ASPP member Nina Fedoroff is also a member of the panel. One of the important areas which may receive increased attention as a result of the plant genome initiative is the area of functional genomics.

NSF may have a program announcement or announcements on the street in early December. Awards will be made in September 1998.



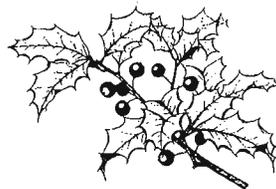
Senator Christopher Bond engineers victory for Plant Genome Research.



NSF Science and Technology Centers Solicitation

A new program solicitation for Science and Technology Centers: Integrative Partnerships can be seen on the world wide web at <http://www.nsf.gov/od/osti> and in the Hot News section of the ASPP homepage at <http://aspp.org>

This solicitation of the National Science Foundation (NSF) is open to proposals from plant science and other disciplines. For example, a center for engineering plants for resistance to pathogens at the University of California, Davis, is a current Science and Technology Center. Deadlines are January 6, 1998, for notice of intent; February 12, 1998, for preproposal; and September 3, 1998, for full proposal.



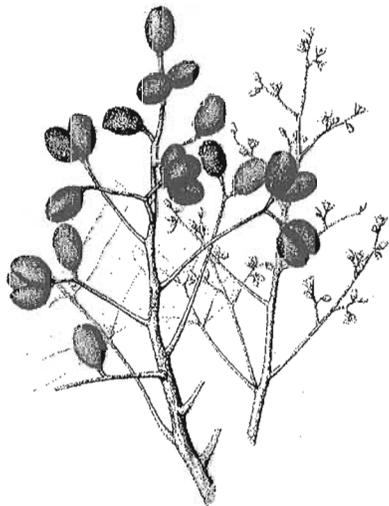
Scientific American Reports ASPP Member Outreach to Congress

A news article in the November 1997 issue of *Scientific American* reporting on the plant genome research initiative in Congress noted the involvement of ASPP members in writing letters to Congress concerning the initiative.

"The American Society of Plant Physiologists has initiated a letter-writing campaign aimed at ensuring that the NSF initiative does not come at the expense of nongenomic plant research," the report said.

ASPP is linked to universities and laboratories across the nation in an electronic network of campus contacts. The ASPP request for provision of new plant genome research funds and an initiative based on plant genome research rather than simply corn genome research was included in the law enacted by Congress as sponsored by Sen. Christopher Bond (R-MO). This action by Congress allows the National Science Foundation to continue full support of existing non-genomic plant research and to accelerate plant genome research in a manner meeting high science standards.

A corn genome initiative, as initially proposed by corn growers, would have taken many decades longer to provide needed results. A corn or plant genome initiative which would have looked to existing research programs for funding would have resulted in a devastating setback to plant science and to the contributions plant research could make to the nation. (See related story on page 9.)



House Joins Senate in Passing Agricultural Research Title Parliamentary Move Stalls Advance to Conference

The House passed the Agricultural Research, Extension, and Education Reauthorization Act (H.R. 2534) on November 8, but members who believed that House Conferees might agree to using surplus Food Stamp administrative funds for research as proposed in the Senate bill used a rare parliamentary move to keep the bill from advancing to a House/Senate Conference.

House Agriculture Committee Chair Bob Smith (R-OR) said he will continue to work for reauthorization of the Research Title. Senate Agriculture Committee Chair Richard Lugar (R-IN) plans to seek enactment of the bill again in January when Congress comes back for the second term of the two-year 105th Conference. Sen. Lugar continues to support the Senate version's Initiative for Future Agriculture and Food Systems (IFAFS) that provides \$780 million in competitive grants over five years for research, education, and extension, which is supported by ASPP. Continued support for the provision is needed as some are predicting that those in opposition to the Initiative will be able to kill the proposed program. The IFAFS would be funded largely with surplus administrative funds from the Food Stamp program. States want to keep those surplus administrative funds in the federal Food Stamp payments to the states.

Following is a summary of several provisions in H.R. 2534, which was passed by the House Agriculture Committee on October 29 before coming to the House floor. The comprehensive reauthorization set management principles for the Department that called for integration of agricultural research, education, and extension functions; that encouraged multi-State and multi-institutional programs; and more emphasis on multi-institutional and multi-functional approaches to achieving agricultural research, education, and extension objectives.

The definition of "food and agricultural sciences" under the bill includes: plant health and production; biotechnology related to agriculture; and animal and plant germplasm collection and preservation among other activities.

The bill included authorization of a number of new and continuing initiatives including those described below.

Agricultural Genome Initiative

The Agricultural Genome Initiative is included in H.R. 2534. The Department of Agriculture had requested \$200 million over four years for the agricultural genome

research initiative. The legislation did not specify the level of funding that would be authorized for the genome initiative. The genome initiative would:

- Support basic and applied research and technology development in the area of genome structure and function in support of agriculturally important species, with a particular focus on research projects that will yield scientifically important results that will enhance the usefulness of many agriculturally important species.
- Study and map agriculturally significant genes to achieve sustainable and secure agricultural production.
- Ensure that current gaps in existing agricultural genetics knowledge are filled.
- Identify and develop a functional understanding of genes responsible for economically important traits in agriculturally important species, including emerging plant and animal diseases causing economic hardship.
- Ensure the future genetic improvement of agriculturally important species.
- Support the preservation of diverse germplasm.
- Ensure the preservation of biodiversity to maintain access to genes that may be of importance in the future.

Availability of funds to support the agricultural genome initiative are largely dependent upon the passage of the IFAFS five-year \$780 million competitive grants program. This IFAFS competitive grants initiative was passed by the Senate and is not currently in the House bill.

National Research Initiative

H.R. 2534 extends the authorization of funding for the National Research Initiative Competitive Grants Program from 1997 to the year 2002. For acquisition of equipment, the legislation allows the Secretary to waive the matching requirement for certain small colleges and universities if the equipment to be acquired costs no more than \$25,000 and has multiple uses within a single research project or is usable in more than one research project.

Combining Medical and Agricultural Research

The legislation extends the pilot research program to combine medical and agricultural research from 1997 to the year 2002. The Fund for Rural America is making funds available this year for research proposals related to plant science and medical research.

Partnerships for High-Value Agricultural Product Quality Research

This proposed competitive grants program would support research and extension activities for high-value agricultural products relating to issues such as:

- Environmental responsibility, e.g., pest management alternatives and biotechnology; sustainable farming methods; and soil conservation and enhanced resource management.
- Genetic research to develop improved agricultural-based products.
- Refinement of field production practices and technology to improve quality, yield and production efficiencies.
- Marketing research regarding consumer perceptions and preferences.
- Economic research, including industry characteristics, growth, and competitive analysis.
- Research to facilitate diversified, value-added enterprises in rural areas.

Primary institutions eligible to be partners would be a land-grant college or university, acting in partnership with other colleges or universities, nonprofit research and development entities, and federal laboratories. Research priorities are to enhance the competitiveness of United States agricultural

products; increase exports of such products; and substitute such products for imported products.

If this provision is eventually enacted as part of the final reauthorization bill, there is still the need to find available funds. A number of programs that are authorized are not implemented for lack of subsequent appropriation of needed funds. The National Research Initiative is an example of a competitive grants program that succeeded in getting both the authorization and the subsequent appropriation of funds. Although a number of programs are authorized that don't eventually receive an appropriation, the authorization is the first key step in the process, except in instances of earmarks in appropriations.

Precision Agriculture

A new competitive grants program to promote precision agriculture is contained in H.R. 2534. An earlier version of this provision called for subjecting all research proposals submitted to the National Research Initiative (NRI) and Fund for Rural America to be reviewed to determine their contribution to precision agriculture before an award could be made. The definition of precision agriculture in that version which

was advocated by special interests was very detailed and limiting. The earlier precision agriculture provision posed a serious threat to the quality and diversity of research for which the NRI and Fund for Rural America could make awards. The version now in H.R. 2534 does not take funding from the NRI or Fund for Rural America. Instead, the current bill authorizes a new competitive grants program.

ASPP successfully led efforts in the science community to oppose the earlier, much more troublesome precision agriculture provisions. Special interests who supported the earlier provision, such as Lockheed-Martin Corp., are expected to continue to be active with regard to this precision agriculture provision throughout the authorization process and in next year's appropriation. Proponents want \$40 million for this precision agriculture program.

Agricultural Education

The legislation includes a sense of the Congress that the Secretary of Agriculture and Secretary of Education should collaborate and cooperate in providing both instructional and technical support for school-based agricultural education.

Scientists Warm to Dr. Krebs' Discussion of Greenhouse Gases

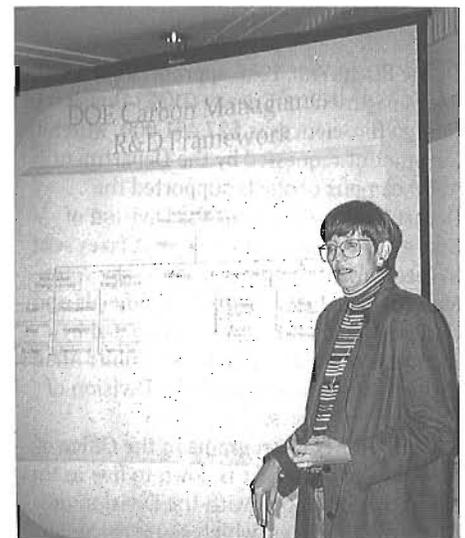
Director of the Department of Energy (DOE) Office of Energy Research Martha Krebs, Ph.D., presented research initiatives of the DOE to a standing-room-only crowd of ASPP members at the opening evening of Plant Biology '97, the annual meeting in Vancouver.

In her presentation, Dr. Krebs noted that many scientific groups do not fully appreciate the national scope and breadth of the research programs supported by DOE's Office of Energy Research with an annual budget of approximately \$2.5 billion. The Office of Energy Research supports a range of research programs from nuclear physics to biology and operates many unique research facilities located at DOE laboratories which are also used by the nation's scientists from academia and industry. Dr. Krebs focused her remarks in particular on the threat of increasing atmospheric carbon dioxide to global warming and the potential research issues and concerns related to growing energy demands and carbon dioxide emissions that likely would involve the plant sciences. She spoke about the need to address research issues with a longer term horizon of 25 to 50 years in addition to focusing on research needs for today and the

next five years. One example mentioned was the long-term planning by an international petroleum company whose analysis of increasing energy demands and potential resources pointed to greater dependence on energy from photovoltaics and renewable resources.

With the use of explanatory charts, Dr. Krebs discussed various options to stem the potential increases in greenhouse gases. Increased use of renewable fuels and alternatives to petroleum-based products, such as plant-produced fuels and chemical feedstocks, are recognized by DOE and others as fossil fuel alternatives to help reduce increases in the level of carbon dioxide in the atmosphere.

A recent DOE report noted that plant genetic research is likely to produce energy crop species that provide consistently higher biomass yields on an energy-content basis, thus providing a proportional reduction in biomass feedstock costs. Related research into new species designed for better fuel production also has been found to look promising by DOE in terms of significantly decreasing biofuels costs over time. DOE found that biomass power can become a major contributor to reducing overall carbon



Dr. Martha Krebs, Director of the Office of Energy Research for the Department of Energy, interacts with plant scientists as she discusses management of carbon dioxide levels in the atmosphere. Dr. Krebs spoke to a standing-room-only audience as the speaker for the Perspectives of Science Leaders program at Plant Biology '97 in Vancouver.

continued on page 12

emissions in coming decades. In introducing Dr. Krebs, ASPP Committee on Public Affairs Chair Lou Sherman noted that Dr. Krebs is one of the most effective spokespersons on behalf of basic research before Congress, winning friends and allies on both sides of the aisle.

For the 10 years preceding her arrival to direct the Office of Energy Research, Dr. Krebs was the associate laboratory director for planning and development at the Lawrence Berkeley Laboratory. Before joining the Laboratory, Dr. Krebs was staff director of the Subcommittee on Energy Development and Applications of the U.S. House of Representatives Committee on Science and Technology.

Following her presentation, Dr. Krebs welcomed many questions and comments from plant scientists in attendance. She stayed to join ASPP members at the opening reception for the Plant Biology '97 meeting, which immediately followed her presentation, and spoke with many members, including a couple of long-time friends and acquaintances, ASPP Board of Trustees Past Chair Larry Vanderhoff, who is chancellor of

Congress Grants DOE Budget Request for Division of Energy Biosciences

The Fiscal Year 1998 appropriation for the Department of Energy (DOE) Division of Energy Biosciences is \$27,461,000, which is the amount requested by the Department. ASPP campus contacts supported the Department's request for the Division of Energy Biosciences in letters and faxes sent to members of Congress prior to key votes. Many personal visits with DOE officials and Congressional offices were conducted by members of the Committee on Public Affairs earlier this year to support the Division of Energy Biosciences.

The number of programs in the Office of Basic Energy Sciences is down to five in this appropriation. Along with the Division of Energy Biosciences, which supports basic plant and microbial research, remaining programs are Materials Sciences, Engineering and Geosciences, Chemical Sciences, and Construction.

the University of California, Davis, and ASPP Past President Bob Buchanan, professor at the University of California, Berkeley.

Among the many ASPP members who had an opportunity to meet and speak with Dr. Krebs during the reception were ASPP Committee on Public Affairs member Elisabeth Gantt, Professor, University of Maryland; Anne Datko, Division Director, USDA National Research Initiative; ASPP President Ken Keegstra, Professor, Michigan State University, MSU-DOE Plant Research Lab, and his wife, Sue Keegstra; ASPP President-Elect Brian Larkins, Professor, University of Arizona and Editor of *THE PLANT CELL*; Janet Slovin, ARS Research Scientist; Committee on Public Affairs member Dawn Luthe, Professor, Mississippi State University; Bernie Phinney, Professor, University of California, Los Angeles; Greg Dilworth and James Tavares of the Division of Energy Biosciences; and then ASPP President Don Ort, Professor, University of Illinois and ARS Research Scientist, and his wife, Sara Ort. Dr. Ort noted that attendees were impressed with Dr. Krebs' open and interactive manner during her talk in which she encouraged questions and comments.

NSF Major Research Instrumentation Solicitation

The National Science Foundation (NSF) is soliciting proposals for the Major Research Instrumentation (MRI) Program. The solicitation is posted on the NSF homepage and can be found at www.nsf.gov/od/osti. The solicitation is not published in hard copy.

The MRI Program provides an opportunity for NSF to partner with academic institutions for the acquisition of state-of-the-art, high-cost research instrumentation and for the development of the next-generation research instrumentation. This instrumentation must be accessible for both research and research training purposes, thus fostering NSF's core strategy of integrating research and education.

ASPP TRAVEL AWARD PROGRAM FOR PLANT BIOLOGY '98

The travel grant award program sponsored by the Society and administered by the Minority Affairs Committee will again be available in 1998. The travel grant application form is on the facing page of this issue of *ASPP NEWS* and can also be found on the ASPP homepage.

The Society is allocating a total of \$35,000 to fund this program, which is open to undergraduate and graduate students, postdoctoral students, and faculty members beginning their careers in the plant sciences. Underrepresented minorities are especially encouraged to apply. ASPP increased the funding of the travel grant program by \$10,000 for 1998, but a change in this year's program is that the monetary award will cover not only the expense of transportation to and from the meeting, plus housing and food, but also all the meeting costs such as registration fees, luncheons, etc.

Awards for the travel grants will be based upon the overall merit of the applications. Another change from the 1997 program is that students applying for a travel grant must include two letters of recommendation.

Application forms to attend Plant Biology '98 in Madison, Wisconsin, are due at ASPP headquarters by **March 30, 1998**. Applicants will be notified of the winners prior to the early-bird registration date, so that preregistration will not be adversely affected. Please contact Deborah Weiner with questions about the travel grant program, at 301-251-0560, ext. 18, or at dweiner@aspp.org.



ASPP TRAVEL GRANT APPLICATION FORM, 1998

ASPP is offering a limited number of travel grants for students and faculty beginning their careers to attend Plant Biology '98 in Madison, Wisconsin. Underrepresented minorities (African American, Hispanic, Native American, Alaska Natives, and Pacific Islanders) are especially encouraged to apply. Application deadline is March 30, 1998. Applicants will be notified of committee's decision by May 15, 1998.

DIRECTIONS: Complete this form and mail with the following:

- Brief curriculum vitae
- Advisor's letter of recommendation, including level of funds available, if any, for applicant travel; and one other letter of recommendation (students and postdocs only)
- Current and pending support (faculty only)
- Any additional sheets required to answer questions posed below

Submit completed application and all attachments by March 30, 1998, to: Travel Grants, American Society of Plant Physiologists, 15501 Monona Drive, Rockville, MD 20855-2768, or fax to 301-309-9196. For more information, contact minority affairs committee staff liaison Deborah Weiner, telephone 301-251-0560, ext. 18, e-mail dweiner@aspp.org.

NAME: _____

CHECK ONE: STUDENT POSTDOC FACULTY

TELEPHONE: _____ FAX: _____ E-MAIL: _____

INSTITUTION: _____

STREET: _____

CITY: _____ STATE: _____ ZIP CODE: _____

ASPP MEMBER? YES NO

LIST PLANT SCIENCE ORGANIZATIONS IN WHICH YOU HOLD ACTIVE MEMBERSHIP: _____

ARE YOU APPLYING FOR ADDITIONAL FUNDS FROM OTHER ORGANIZATIONS? YES NO

IF YES, FROM WHOM AND FOR HOW MUCH? _____

Briefly describe your current research focus. (If you intend to present a paper or poster, you may submit your abstract in lieu of this paragraph.)

On a separate page, write an essay in which you explain why attending a plant science meeting 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



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

ASPP Members Aid in Revising High School Lab Exercises

Washington Section ASPP members Mark Holland (Salisbury State University, Salisbury, MD) and Doug Luster (USDA-ARS, Frederick, MD) were invited by Kathy Frame, National Association of Biology Teachers (NABT), to participate in a Student Research Lab Review panel September 4-7 in Herndon, VA. The panel reviewed and revised high school-level biology laboratory exercises, over 50% of which included or focused on aspects of plant biology. The laboratory exercises arose from a joint NABT/National Science Foundation project headed by Kathy Frame, which will result in publication of the exercises by NABT in a looseleaf notebook format, to be entitled "Student Research in the Classroom."

Plant Physiology Web Sites

Several new WWW sites involving photosynthesis have come online recently. By visiting the sites below (and their links), one can get a feel for how the technology of the internet is being utilized by plant physiologists. The European and American Societies for Photobiology operate Photobiology Online (<http://www.kumc.edu/POL/>), which has a lot of information and numerous links to other photobiology sites. The Arizona State University/Photosynthesis Center (<http://photoscience.la.asu.edu/photosyn/default.html>) has some useful links to other photosynthesis sites, whereas the International Society of Photosynthesis Research (<http://www.life.uiuc.edu/plantbio/ispr/index.html>) is developing a site that centers mostly around the triennial International Congress on Photosynthesis.

Archives for several plant-based newsgroups are found at: PLANT-BIOLOGY/bionet.plants, PHOTOSYNTHESIS/bionet.photosynthesis, and PLANT-SIGNAL-TRANSDUCTION/bionet.plants.signaltransduc. Of course, the Plant Ed Newsgroup (PLANT-EDUCATION/bionet.plants.education) continues to maintain its activity in all areas of botanical education.

Reaching for the Sun: How Plants Work

by John King, Cambridge University Press, Cambridge, UK
Comments by Robert R. Wise, Biology Dept., UW-Oshkosh

In this thoroughly readable book, John King takes time to fully explain, in understandable terms, all aspects of the physiology of higher plants. In the preface, Dr. King (Professor of Biology, Saskatchewan University, Canada) explains how a conversation with his neighbor made him realize just how little the non-botanist understands about the inner workings of plants. With this in mind, the book is aimed at the inquisitive layman. The 17 chapters cover all the bases in modern plant physiology: transpiration, photosynthesis, respiration, nitrogen metabolism, mineral nutrition, phloem transport, growth, photoperiodism, dormancy, environmental stress, accessory pigments, fragrance and flavors, chemical defenses, alleopathy, medicinal plants, and, finally, senescence. The chapters provide an historical perspective to the major discoveries in each sub-field by focusing on the scientists and theories that led us to our current understanding. This reviewer found the historical approach quite useful and broadening. Phenomena and processes are explained in terms of common garden or horticultural plants with many practical explanations of common plant phenomena. *Reaching For the Sun* is probably too long for an introductory botany course and perhaps not detailed enough for an upper level plant physiology course. However, these are not the purposes for which it was written. It is ideally suited for its target audience, namely, anyone who has ever wondered how plants work. With this book, Dr. King brings excitement and wonder to what is arguably the most active area in botany today.

Plant Biology '98

**Madison, Wisconsin,
USA**

**Saturday, June 27th
through
Wednesday, July 1,
1998**

SYMPOSIA:

EMERGING PLANT HORMONES

Organizer: Joanne Chory

CELL-TO-CELL

COMMUNICATIONS &

INTERACTIONS

Organizers: Daphne Preuss and

Judy Verbeke

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PLASMODESMATA

Organizer: William Lucas

CELL WALL DYNAMICS

Organizer: Kenneth Keegstra

**Also, 24 minisymposia, posters,
exhibits, workshops, and social
and networking events.**

ASPP INTERNATIONAL PLANT BIOLOGY IN VIETNAM

Those of us who attended the 5th Congress of the International Society of Plant Molecular Biology in Singapore experienced first-hand the realization that modern plant biology, with a heavy emphasis on biotechnology and crop improvement, is increasing exponentially in several Asian countries, especially in China, Taiwan, Singapore, and Korea. I used my trip to Singapore as a springboard to visit Vietnam, since I am curious about the country and about the state of plant biology there. The liberalization of Vietnam's policies on foreign investments and the recent lifting of the embargo by the U.S. government are opening up Vietnam to tourism and investment by Americans. I was graciously received, and throughout my visit I detected no rancor toward Americans. Rather, the overwhelming feeling in both Hanoi and Ho Chi Minh City (Saigon) was, "The war is behind us; let's get on with our lives and with solving the problems our country faces."

Our membership directory does not list a single member from Vietnam and there are no institutional subscriptions either. I also cannot recall any articles from Vietnam in our journals. Nevertheless, I found that plant biology is alive in Vietnam, although quite starved for funds. The government has emphasized plant biotechnology as one of 10 research/technology areas to be developed, but government research grants are small.

Scientists earn a monthly salary comparable to \$ 60 (U.S.), so they cannot afford personal subscriptions to journals. The research grants are so small that there is no extra money for books. However, they do have PCR machines, they can transform plants, and they are connected to the world by e-mail (but not yet to the world wide web). Many of the senior scientists in Hanoi received excellent training, initially in Eastern bloc countries (the former USSR, Hungary, and East Germany) and more recently in Austria, Belgium, Germany, Japan, and the USA.

I visited institutes in Hanoi only, but I was given the impression by my host Dr. Nong Van Hai that this is where most of the action is. Scientists at the two major institutions, the Institute for Biotechnology of the National Center for Natural Sciences and Technology (NCST) and the Institute of Agricultural Genetics, carry out a variety of projects in areas of crop improvement and crop biodiversity. A higher level of research activity depends on outside sponsorship, and two rice gene mapping projects are supported by the Rockefeller Foundation. Also, the Ministry of Education of Flanders, through a collaboration with Marc Van Montagu from Gent, Belgium, supports a project on genetic engineering of crops. The MacArthur Foundation sponsors a project on the screening of plants of the tropical forests for cytotoxins. A project focused in part on cassava is about to begin under the auspices

of the International Service for the Acquisition of Agri-biotech Applications (ISAAA), an umbrella organization of biotech companies and nonprofit sponsors. Contamination of soils with dioxin and other chemicals is a very serious problem in Vietnam, and one of the scientists at the Institute for Biotechnology is attempting to get a bioremediation project funded.

You can help by sending a book. What struck me most as I toured the Institutes was the almost complete absence of books and journals. If you want to help, you could do so by sending one recent plant biology or biotechnology book to Dr. Nong Van Hai, Institute for Biotechnology of the NCST, Nghiado, Tuliem, Hanoi, Vietnam. Dr. Nong has promised to put the books in a reading room so that they will be accessible to scientists from all over Hanoi. Books in French and in German are also welcome. If they receive more than one copy of the same book, these copies will be distributed.

Plant biology in Vietnam is not yet at the take-off point, but given the amount of economic activity and foreign investment in the country, and the priority being given to scientific research, it won't be long before we will establish exchanges and communications with our Vietnamese counterparts.

Maarten Chrispeels
University of California, San Diego

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July 1997

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NEW ANNUAL MEETING FORMAT!

CALL FOR ABSTRACTS

Submit your abstract for Plant Biology '98 via the World Wide Web.

(Abstracts will also be accepted by physical mail. Faxed abstracts will not be accepted.)

All abstracts submitted for Plant Biology '98
will be accessible for browsing and searching on the
World Wide Web beginning in April 1998.

The new program format for the 1998 annual meeting will include five major symposia, 24 minisymposia selected primarily from the submitted abstracts, and poster presentations (no oral presentations). All posters will be on display for four days. Authors should submit their abstracts in one of the 22 poster categories. The program committee will also use these abstracts as a basis for composing the 24 minisymposia. 20 of the minisymposium topics are listed on page 3 of the call for abstracts. Suggestions or proposals for any of the four additional minisymposium topics should be sent to Susan Chambers, chambers@aspp.org or Plant Biology '98, 15501 Monona Dr., Rockville, MD 20855 USA.

IMPORTANT NOTICE

**To be able to submit and view abstracts on the
World Wide Web,
instructions for authors have been
significantly changed from previous years.**

**It is essential to read and follow carefully the enclosed new
instructions for submitting abstracts to Plant Biology '98.**

**The new system will work best for
abstracts submitted via the World Wide Web.**

**All authors who have the electronic capability to submit via the Web
are urgently requested to do so.**

Deadline for Receipt of Abstracts

FRIDAY, FEBRUARY 6, 1998.

Do not submit before

Thursday, January 15, 1998.

CALL FOR ABSTRACTS

PLANT BIOLOGY '98:

1998 Annual Meeting of the
American Society of Plant Physiologists

Saturday, June 27–Wednesday, July 1, Madison, WI, USA

Deadline: Friday, February 6, 1998
Do not submit abstracts before January 15, 1998.

PLEASE READ THE FOLLOWING CAREFULLY BEFORE SUBMITTING ABSTRACTS FOR PLANT BIOLOGY '98

Abstracts to Be Submitted and Viewed Electronically for Plant Biology '98

For Plant Biology '98, abstracts should be submitted via the World Wide Web, and the annual abstract supplement will be available for viewing and searching on the Web beginning in April 1998. We will also publish a printed version of the abstract supplement in 1998 which will be available to attendees at the meeting.

Abstracts will be available for viewing and program details will be attached to the abstracts, making it possible for you to plan your visit to the annual meeting with precision long before you get to the meeting. The Web site will make it possible for you to prepare and print out a personal program to guide you at the meeting.

The deadline for submission is Friday, February 6, 1998. Abstracts may not be submitted before Thursday, January 15, 1998.

This system will work best for members who have access to the World Wide Web through a forms-capable Web browser such as Netscape 2.0 or later (which can be easily downloaded from the Web for all who have appropriate system configurations) or Internet Explorer. We strongly urge all members who are able to do so to use this method of submission. The more abstracts that are received via the Web, the better the electronic abstract supplement will work.

In recognition that not all members have access to the Web or to the proper browsing software, abstracts may also be submitted via physical mail. Although this alternate method of submission will work, it is cumbersome and expensive to convert to the Web file. Again, we urgently request everyone who has World Wide Web capability to use that format to submit his or her abstract.

For all abstract submissions, authors will be strictly limited to 1800 characters in the body of the abstract.

Automatic acknowledgments will be sent to all who submit, regardless of the method they use.

Inside this insert are the new instructions for submitting your abstracts electronically (or by regular mail if you don't have access to the Web). For this electronic submission project to work effectively, it is critical that you read and follow these new instructions carefully when you send your abstracts for Plant Biology '98. If you have any questions, contact Susan Chambers at chambers@aspp.org or 301-251-0560, ext. 11.

Remember the following four guidelines:

- Limit the body of your abstract to 1800 characters .
- Do not submit any abstracts before January 15, 1998.
- Be sure to submit by Friday, February 6, 1998.
- Do not use fax.
- Most important:

IF AT ALL POSSIBLE, SUBMIT BY WORLD WIDE WEB.

FOLLOW THE ENCLOSED INSTRUCTIONS EXACTLY.

Call for Abstracts—Plant Biology '98
1998 ASPP Annual Meeting
Madison, WI, USA, Saturday, June 27–Wednesday, July 1

HOW TO SUBMIT AN ABSTRACT TO PLANT BIOLOGY '98

We urge all who have the electronic capability to use the World Wide Web.

I. Via the World Wide Web

1. Select a poster presentation report category from the list below.
2. A member may submit or sponsor one research abstract and one Education abstract.
3. Deadline for receipt is Friday, February 6, 1998. DO NOT USE FAX.
4. DO NOT include any graphics or tabular material in the body of your abstract.
5. Access URL <http://aspp.org/abstract>. You must have a forms-capable browser (for example, Netscape 2.0 or above or Internet Explorer).
6. Detailed instructions will be provided on the screen. Enter the information called for in each field. If you use special characters (super- or subscripts, italics, or bold), you will be asked to enter some simple text mark up codes. The codes will be provided in the instructions on screen. Spell out all Greek letters (i.e., alpha for α , beta for β , and so forth). The system will provide an immediate proofing copy to ascertain that you have entered the codes properly. The system will count the characters (minus the codes) and will not permit you to enter an abstract of more than 1800 characters.
7. After proofing, press the "Submit" button. Acknowledgment will be sent to you by e-mail.

II. Via Physical Mail

1. Select a poster presentation report category from the list below.
2. A member may submit or sponsor one research abstract and one Education abstract.
3. Deadline for receipt is Friday, February 6, 1998. DO NOT USE FAX.
4. DO NOT include any graphics or tabular material in the body of your abstract.
5. Use this method of submission *only* if you do not have access to the World Wide Web.
6. Fill in the form on the opposite page exactly as it is shown and within the space provided.
7. Type the abstract in the area provided; DO NOT exceed 1800 characters. Spell out all Greek letters (i.e., alpha for α , beta for β , and so forth). A proofing copy and acknowledgment will be e-mailed to you; if you do not have or do not provide an e-mail address, the proofing copy will be sent by fax.
8. Mail two flat, unfolded copies (original and photocopy) of your abstract to Plant Biology '98 Abstracts, 15501 Monona Drive, Rockville, MD 20855-2768 USA.

Minisymposium Topics:

Following are 20 of the 24 minisymposium topics for Plant Biology '98. The program committee will use the abstracts submitted as poster presentations as a basis for composing the minisymposia. If your abstract is chosen by the program committee for a minisymposium presentation, you will be contacted before April 1, 1998. The program committee also wishes to receive suggestions or proposals for four additional minisymposium topics. This should be sent to Susan Chambers at chambers@aspp.org, or Plant Biology '98, 15501 Monona Drive, Rockville, MD 20855 USA.

Protein Targeting
Moving from Model Plants to Improved Crops
Emerging Model Systems in Plant Biology
Identification of Gene Function in a Genomic Era
Lipid Mediated Signaling
Flower Induction
Vegetative Cell Development and Differentiation
Cytoskeletal Dynamics
Metabolite Regulation Via Inter-organellar Communication
Rhizosphere Biology

Ion Pumps and Ion Transporters
Regulation of C and N Partitioning
Oxidative Stress
Light Responses
Hormone Mode of Action
Long Term and Large Scale Carbon Enrichment
Starch Metabolism
Plant Insect Interactions
Transcriptional Regulation
Computer Assisted Instruction

POSTER PRESENTATION REPORT CATEGORIES

Abstracts for poster presentations (no orals) may be submitted in any of the following 22 categories. A member may submit or sponsor one research abstract and one education abstract. Posters will be on display for four days.

1. Reproductive Biology
2. Vegetative Development
3. Seed Physiology
4. Signal Transduction
5. Cell Walls and Cytoskeleton
6. Interactions of C and N Metabolism
7. Lipids and Related Molecules
8. Mitochondria and Respiration
9. Natural Products, Medicinals, Ethnobotany
10. Protein Processing, Trafficking, and Assembly
11. Root Physiology
12. Transgenics and Biotechnology
13. Assimilate Partitioning and Allocation
14. Environmental Response and Adaptation
15. Enzymology and Metabolism
16. Plant Genomics
17. Growth Regulators and Hormones
18. Membrane Transport
19. Photosynthesis
20. Plant Interactions with Other Organisms
21. Regulation of Gene Expression
22. Education

Address any questions to Susan Chambers, chambers@aspp.org or 301-251-0560, ext. 11.

DEADLINE FOR SUBMISSION: FRIDAY, FEBRUARY 6, 1998. DO NOT SUBMIT BEFORE JANUARY 15, 1998.

**FOLLOW THIS FORM EXACTLY TO SUBMIT AN ABSTRACT TO
PLANT BIOLOGY '98 BY PHYSICAL MAIL**
(Type information directly onto this form and mail this original and one photocopy.
Please submit via physical mail only if you lack the electronic capability to submit via the Web)

ABSTRACT TITLE (Type in sentence style: capitalize first letter of first word only; type all other words except proper names in lower case letters):

AUTHOR:	AFFILIATION:

POSTER PRESENTATION REPORT CATEGORY (select from list at the bottom of page 3 of the call for abstracts):

MINISYMPOSIUM TOPIC (if you would like the program committee to consider your abstract for a minisymposium, select from the minisymposium topics list on page 3 of the call for abstracts):

SUBMITTING OR SPONSORING MEMBER (a member may submit or sponsor one research abstract and one education abstract):
NAME:

PRESENTER'S NAME (if e-mail address cannot be provided, fax number must be provided):
MAILING ADDRESS:

TELEPHONE:

E-MAIL ADDRESS:

FAX:

BODY OF ABSTRACT: (Abstract must fit into space below, and it *must not* exceed 1800 characters. Present all elements of a research report [introduction, materials and methods, results, discussion] but **without headings**. End abstract with acknowledgment of funding sources, if applicable. Do not indent first line of abstract. **DO NOT** break copy into paragraphs. **DO NOT** include graphics or any tabular material. Spell out all Greek letters [e.g., alpha for a, beta for b, and so forth]. Super- and subscripts, bold, and italics may be used. Abstracts submitted by physical mail will be retyped to be put into the electronic file that will appear on the Web and be used for printing the abstract supplement. Mail two flat, unfolded copies of this abstract (this form and a photocopy) to Plant Biology '98 Abstracts, 15501 Monona Drive, Rockville, MD 20855-2768 USA.)



Coal, Petroleum, and Wound Respiration

by George G. Laties
Professor of Biology Emeritus
University of California, Los Angeles

When in the latter 1950s, Roderic Park, then a graduate student in the biology department, and Samuel Epstein, a professor of geological sciences at Caltech, began to ponder the reasons why carbon mass-isotope fractionation in petroleum differed from that in coal, it didn't occur to me — then a Caltech research fellow in biology — that their investigation had any bearing on my concern about whether wound respiration in potato slices — or, for that matter, wound respiration in general — represented an augmentation of normal respiration or a distinct respiratory manifestation. It had been known since landmark work in the early 1950s (1, 2) that carbon mass-isotope fractionation resulted in varying degrees of isotope enrichment in plant materials compared with the mass-isotope ratio of carbon in the CO₂ of air. In particular, terrestrial plant material was found to be markedly enriched in ¹²C compared with its prevalence in CO₂ in air, notwithstanding that ¹³C comprises less than 1% of CO₂ carbon in air (1, 3). Furthermore, plant lipids were found to have a considerably greater enrichment of ¹²C than that characterizing the whole plant (3; cf.1); that is, plant lipids were “lighter” — and not in the sense that lipids float!

Carbon mass-isotope ratios of metabolites of interest are expressed in relation to the carbon isotope ratios in the carbonate skeleton of the fossil cephalopod *Beleminitella americana*. Thus, $\delta^{13}\text{C}$ per mil = $(\frac{[^{13}\text{C}/^{12}\text{C}]_{\text{sample}} - [^{13}\text{C}/^{12}\text{C}]_{\text{standard}}}{[^{13}\text{C}/^{12}\text{C}]_{\text{standard}}}) \times 1000$. The standard has a ratio greater than that of any of the substrates in question; therefore, the sample δ values accordingly are negative. Because the ratios are small on an absolute basis, values are expressed per mil, rather than as percent. Nevertheless, differences between the δ values in different classes of metabolites are highly significant. Thus, in potato, δ starch = -25.5 per mil and δ lipid = -34.8 per mil, while δ CO₂ of air = -7 per mil(4).

Park and Epstein (5) established that carbon fixation in photosynthesis is responsible for the largest share of metabolic carbon mass-isotope discrimination (for thermodynamic reasons), while dissolving of

gaseous CO₂ provides an earlier physical fractionation (for kinetic reasons). The subsequent discrimination step in the conversion of a carbohydrate precursor (presumably pyruvate or acetate) to lipid was left undefined, but the phenomenon of exceptional ¹²C enrichment in lipids provided our turning point in work that was to follow.

During commonplace laboratory prattle with Rod Park, we decided on a Saturday morning experiment in which we collected respiratory CO₂ from potato slices immediately upon cutting, and thereafter at regular intervals, and submitted them to carbon mass-isotope analysis. The ¹³C/¹²C ratio in the earliest respiratory CO₂ proved inordinately high — emblematic of no plant materials known to us. The ratio dropped in the next few hours, however, seemingly heading for a value lower than the typical value of carbon in starch or protein. Rod Park was busy with other matters (he subsequently became professor and vice chancellor at the University of California, Berkeley, and chancellor of the University of Colorado), so the problem lay fallow until it was taken up again by Bruce Jacobson and me at UCLA in the late 1960s, with the inestimable collaboration of Bruce Smith, now at Brigham Young University, and Samuel Epstein.

In the interim, I pursued indirect methods of distinguishing wound respiration from natural respiration. Thus, it was established that the respiration of fresh slices (some five times the rate of tuber respiration and, presumably, mainly wound respiration) was largely resistant to malonate, an inhibitor of succinate oxidation, in distinction to the malonate sensitivity of the respiration of aged slices(6). Further, fresh slices proved unable to metabolize exogenous glucose or any substrates of the tricarboxylic acid cycle — again in distinction to aged slices (7). The only exogenous substrates yielding radioactive CO₂ were carboxyl-labeled myristate and labeled propionate (8).

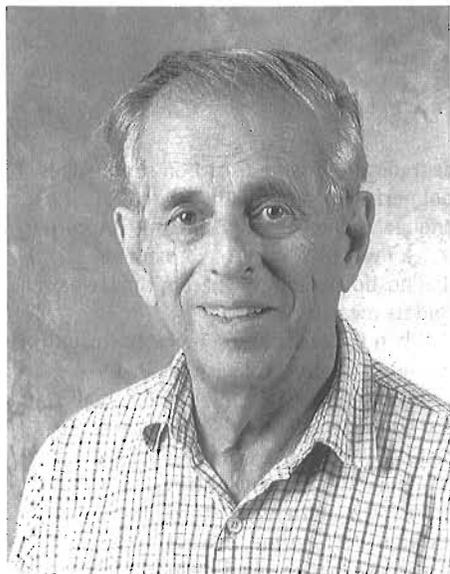
Finally, a significant fraction of fresh slice respiration — and a higher fraction of uncoupled fresh slice respiration — was found to be inhibited by imidazole, a selective inhibitor of fatty acid oxidation (9), an observation that led increasingly to the view that fresh slice respiration entailed lipid, hence, fatty-acid oxidation, albeit by an anomalous path. In any event, the ability to

degrade an exogenous carbon source does not perforce reveal the nature of the endogenous respiratory substrate. Accordingly, I was motivated to return to a diagnostic procedure wherein the tissue slice told its own story.

When Bruce Jacobson revisited the entire matter in connection with his Ph.D. dissertation, his first observations reaffirmed the anomalously high ¹³C/¹²C ratio of the respiratory CO₂ of fresh potato slices immediately following cutting. Again, the ratio dropped thereafter through the first few hours. This time, however, we took note of the fact that the equilibrium ¹³C/¹²C ratio in dissolved bicarbonate is higher than that in dissolved CO₂ by about 7 per mil (4, cf.3); that is, bicarbonate is “heavy.” Because the pH of the cytosol and of the bathing solution were roughly 7.0, the dissolved CO₂/bicarbonate in both the cytosol and in the apoplast was deemed to be predominantly in the form of bicarbonate. Because the CO₂ and bicarbonate dissolved in tuber tissue at the time of cutting were gradually replaced by wound-induced respiratory CO₂, the early collected CO₂ was contaminated with “heavy” CO₂ released from the bicarbonate in place in the intact tuber. Further distortion, although in the opposite direction, involved tangible bicarbonate refixation into organic acids during early wound respiration (4) — selectivity favoring fixation of ¹²C over ¹³C bicarbonate, just as ¹²C is favored over ¹³C in photosynthetic CO₂ fixation(5). To avoid both sources of ambiguity, experiments were repeated at pH 5.0. In this case, the CO₂ in the first hours approached a δ value of -34.8, an unambiguous lipid value that left little doubt that wound respiration comprised lipid as substrate, while with time, conventional respiration prevailed with carbohydrate as substrate(4).

What then provides lipid substrate in wounded tissue? In all probability, fatty acids arising from the degradation of membrane phospholipids — both from the endoplasmic reticulum and mitochondria. Phospholipid degradation is rife in wounded tissue — viz. in slices (10) — and conventional respiration is reasserted only upon membrane resynthesis. An unsuspected aspect of the transition from carbohydrate-based to lipid-based respiration attends the engagement of the

continued on page 22



George Laties, author of this issue's Turning Point.

CN-resistant alternative path(11). When CN is given 24-hr-aged potato slices with conventional elevated carbohydrate-based respiration, lipid rapidly becomes a major respiratory substrate, with little inhibition of overall respiration rate. (Parenthetically, enhanced lipid-based respiration occurs in *Sauromatum spadix* mitochondria at the time of the respiration explosion at the peak of anthesis when there is reason to believe the CN-resistant electron path is engaged [12], and a switch from carbohydrate- to lipid-based respiration occurs in alloxan-induced diabetes [13].) The mechanism and rationale for the noted effect of CN on substrate choice remain a mystery and beg for further attention. Our turning point opened vistas never imagined.

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George Laties attended the College of Agriculture at Cornell University with the visionary intent of becoming a farm advisor or a county agent. After receiving the Bachelor's degree in 1941, and on further reflection, he went on to obtain the Master's degree in plant physiology and biochemistry at the University of Minnesota in 1942, and ultimately a Ph.D. in plant physiology in 1947 in the Division of Plant Nutrition at the University of California, Berkeley, with Professor D.R. Hoagland. While his first incarnation at Berkeley was as a transport worker (salt transport, that is), he soon focused on plant respiratory metabolism as the driving force in ion uptake. The Berkeley experience was interrupted by a stint in the U.S. Navy as a radar technician aboard a minesweeper in the China Sea. Upon finishing at Berkeley, he went on intermittently over a 12-year period to be a fellow and senior fellow in biology at Caltech in the ambiance of James Bonner, Fritz Went, and Arthur Galston. The Caltech sojourn was interspersed with a year as a Rockefeller Foundation fellow in Britain in 1949-1950 with Sir Hans Krebs, then at the University of Sheffield, and C.S. Hanes at Cambridge University, and with a three-year stint from 1952-1955 as assistant professor in the Department of Botany at the University of Michigan.

In 1959, he became associate professor of horticultural science at UCLA in the enriching presence of Professor Jacob Biale. With the demise of the College of Agriculture at UCLA, he became professor of plant physiology in the Department of Botany, and ultimately, professor in the Department of Molecular, Cell and Developmental Biology, where he served until retirement. In 1956-1957, he enjoyed a year as a Guggenheim fellow in the biochemistry section of the CSIRO in Canberra, Australia. He has been a member of the ASPP since his graduate days, chair of the West Coast section of ASPP in 1964, and for numberless years a member of the editorial board of *Plant Physiology*. When not otherwise occupied, he pummels his Rottweiler.

Gatherings



The newsletter 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 Sylvania J. Braxton, *ASPP NEWS*, 15501 Monona Drive, Rockville, MD 20855-2768 USA. **Faxed transmissions are not accepted.**

FUTURE ASPP ANNUAL MEETING SITES

1998: Madison, Wisconsin
Saturday, June 27, through
Wednesday, July 1

1999: Washington, D.C.
Saturday, July 24, through
Wednesday, July 28

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

MARCH

March 8-11, 1998
Bioremediation for Industry,
Co-sponsored by the Society for
Industrial Microbiology and the Center for
Environmental Science and Technology
University of Notre Dame, Notre Dame, Indiana
For more information, please contact the (SIM)
office at 703-691-3357. Visit the
SIM website at <http://www.simhq.org> or e-mail
info@simhq.org.

March 23-27, 1998
1998 Annual Meeting of the
Society for Experimental Biology
Water and Its Transport:
From Cells to Whole Plants
University of York, England, United Kingdom
Closing date for submissions: October 17, 1997.
Abstracts for program will need to be submitted
by mid-January 1998. Send information and
submissions to: Prof. A. Deri Tomos (SEB Water
Transport), School of Biological Sciences,
University of Wales Bangor, Bangor, Gwynedd,
LL57 2UW, Wales, UK; fax 01248 370731, e-mail
a.d.tomos@bangor.ac.uk. The Society for
Experimental Biology can be contacted at:
Burlington House, Piccadilly, London WV1 0LQ,
UK; telephone 0171 439 8732, fax: 0171 287 4786,
e-mail v.wragg@sebiol.demon.co.uk or web
address <http://www/demon.co.uk/SEB/>.

March 29-April 2, 1998
5th International Workshop on
Pathogenesis-Related Proteins in Plants:
Signaling Pathways and Biological Activities
Aussols, France
Contact : Bernard Fritig, IBMP-CNRS, 12, rue du
General Zimmer, 67000 Strasbourg, France; fax
33 (0)388 61 4442, e-mail PR98@ibmp-ulp.u-strasbg.fr, Internet <http://scilla.u-strasbg.fr/PR98/PR98.html>.

March 31, 1998
Management of Fruit Ripening Workshop
University of California, Davis
Contact: Ms. Sharon Munowitch, University
Extension, University of California, Davis,
California 95616; telephone 916-757-8899, fax
916-757-8634, e-mail
smunowit@unexmail.ucdavis.edu.

1997

DECEMBER

December 1-3
Third General Meeting of the
French Society of Plant Physiology
Toulouse, France

For more information contact: J.C. Pech; M.
Bouzayen, telephone 33 (0)5 62 13 65 13, fax 33
(0)5 62 13 65 41, e-mail agrotoulouse@ensat.fr,
Web site <http://www.ensat.fr>.

December 11-14
1997 Biotechnology Conference at
Cold Spring Harbor
The Arabidopsis Genome:
From Sequence To Function
Cold Spring Harbor, New York

Abstract Deadline: October 31, 1997. Arranged by:
Mike Bevan, The John Innes Centre, UK, and Rob
Martienssen, Cold Spring Harbor Laboratory. Cold
Spring Harbor encourages online registration and
electronic abstract submission (see <http://www.cshl.org/meetings/>). For information
contact: Meetings & Courses, Cold Spring Harbor
Laboratory, Cold Spring Harbor, New York 11724;
telephone 516-367-8346, fax 516-367-8845, e-
mail meetings@cshl.org.

December 13-17
37th American Society for
Cell Biology Annual Meeting
Washington Convention Center, Washington, DC
For information contact: ASCB National Office,

9650 Rockville Pike, Bethesda, Maryland 20814-
3992; telephone 301-530-7153, fax 301-530-7139,
e-mail ascbinfo@ascb.org, website <http://www.ascb.org/ascb>.

1998

JANUARY

January 8-10, 1998
International Symposium Antitumour
Products from Higher Plants
Paris, France

Deadline for abstracts: September 1, 1997. For
information, contact: Symposium Secretariat,
Antitumour Products, Congrès Scientifiques
Services (C2S), Chantal Iannarelli, 1, rue des
Villarmains, 92210 Saint Cloud, France; telephone
33 (0)1 47 90 04, fax 33 (0)1 47 71 90 05.

January 8-11, 1998
Seventh Western Regional
Photosynthesis Conference
Asilomar Conference Center
Pacific Grove, California

For information and circular, contact: Rick Debus,
Department of Biochemistry, University of
California, Riverside, CA 92521-0129; telephone
909-787-3483, fax 909-787-4434, e-mail
debusrj@citrus.ucr.edu; or Gerry Edwards,
Department of Botany, Washington State
University, Pullman, WA 99164-4238; telephone
509-335-2539, fax 509-335-3517, e-mail
edwardsg@mail.wsu.edu.

APRIL

April 6-8, 1998

International Meeting on Production and Uses of Starch Edinburgh, Scotland

Contact and mailing list: Dr. Carol Duffus, Crop Science and Technology Department, SAC, West Mains Road, Edinburgh EH9 3JG, Scotland; e-mail esa216@ed.sac.ac.uk.

April 7-10, 1998

Plasma Membrane Redox Systems: Their Role in Biological Stress and Disease Antwerp, Belgium

For full information please contact: Han Asard, Department of Biology, University of Antwerp (RUCA), Groenenborgerlaan 171, B-2020 Belgium; telephone +32 3 2180420, fax +32 3 2180417, e-mail hanasard@ruca.ua.ac.be.

April 19-22, 1998

The Phytochemical Society of Europe Biosynthesis of Isoquinoline, Indole, and Related Alkaloids Istanbul, Turkey

Paper deadline is January, 1998. Contact: Professor G. Sariyar, Istanbul University, Faculty of Pharmacy, 34452 Beyazit, Istanbul, Turkey; telephone 90 212 526 0737, fax 90 212 519 0812.

April 27-May 2, 1998

The 3rd Asian Crop Science Conference: Regional Production Strategies to Meet Food Needs Toward The 21st Century Taichung, Taiwan

For information, please contact: Jih Min Sung, telephone 886-4-2870551, fax 886-4-2860267, e-mail acsc@dragon.nchu.edu.tw.

MAY

May 3-6, 1998

Beltsville Symposium in Agriculture XXIII entitled Fresh Fruits and

Vegetables: Quality and Food Safety USDA/ARS, Beltsville, Maryland

Organizers of the Symposium: Kenneth C. Gross and Chien Yi Wang. For a pre-registration form or other information, contact: Kenneth C. Gross, USDA/ARS, Horticultural Crops Quality Laboratory, Building 002, 10300 Baltimore Avenue, Beltsville, MD USA 20705; telephone 301-504-6128; fax 301-504-5107, e-mail kgross@asrr.arsusda.gov; web site <http://www.barc.usda.gov/symp98/>.

May 10-13, 1998

The Phytochemical Society of Europe Progress in Phytochemistry Kerkraade, The Netherlands

Contact: Professor Dr. A.W. Alfermann, Institut für Entwicklungs- und Molekularbiologie der Pflanzen, Heinrich-Heine-Universität Düsseldorf, Universitätsstrasse 1, Geb. 26.13, D-40225 Düsseldorf, Germany; telephone 49 211 811 4603, fax 49 211 811 3085, e-mail alferman@rz.uniduesseldorf.de.

May 21-24, 1998

The First Conference of the International Coenzyme Q10 Association Boston, Massachusetts

For information contact Prof. Flint Beal, Neurology Service, Warren 408, Massachusetts General Hospital, Fruit Street, Boston, MA 02114; telephone 617-726-8463, fax 617-724-1480.

May 28-30, 1998

Phosphorus in Plant Biology: Regulatory Roles in Molecular, Cellular, Organismic, and Ecosystem Processes Pennsylvania State University, University Park

Organizers: Jonathan Lynch and Jill Deikman. Contact: Jonathan Lynch, Department of Horticulture, Penn State, University Park, PA 16802; telephone 814-863-2256; fax 814-863-6139, e-mail jpl4@psu.edu. For more details visit our web site at: <http://www.lsc.psu.edu/phys/annualsym.html>.

May 30-June 3, 1998

The 1998 Meeting of the Society for In Vitro Biology Las Vegas, Nevada

For more details, visit our site at www.sivb.org/cong1998.htm. Related sites are www.sivb.org/links.htm or www.sivb.org/plant.htm, and our home page at www.sivb.org.

JUNE

June 2-6, 1998

8th International Symposium on Preharvest Sprouting in Cereals Detmold, Germany

Contact: K. Niebuhr/D. Weipert, Assoc. of Cereal Research, Schutzenberg 10, D-32756 Detmold, Germany; telephone 49(0)5231 25530, fax 49(0)5231 20505 or M.K. Walker-Simmons, USDA-ARS, 209 Johnson Hall, Washington State Univ., Pullman, WA 99164-6420, e-mail ksimmmons@wsu.edu.

June 2-7, 1998

8th International Conference on the Cell and Molecular Biology of Chlamydomonas Tahoe City, California

Organizer: William J. Snell, University of Texas Southwestern Medical Center. Co-organizer: Elizabeth Harris, Duke University. For more information, check the web site at http://www.swmed.edu/home_pages/chlamy/1998chlamy.html.

June 14-19, 1998

IX International Congress on Plant Tissue and Cell Culture The ICC Jerusalem International Convention Center Jerusalem, Israel

For further information contact: The Secretariat, IX International Congress on Plant Tissue and Cell Culture, P.O. Box 50006, Tel Aviv 61500, Israel; telephone 972 3 514 0000, fax 972 3 517 5674 / 972 3 514 0077, e-mail plant@kenes.com.

June 22-July 3, 1998

Postharvest Technology of Horticultural Crops Short Course

University of California, Davis

Contact: Ms. Sharon Munowich, University Extension, University of California, Davis, California 95616; telephone 916-757-8899, fax 916-757-8634, e-mail smunowit@unexmail.ucdavis.edu.

June 24-28, 1998

9th International Arabidopsis Meeting Madison, Wisconsin

Contact: Arabidopsis (arabidopsis@biochem.wisc.edu), fax 608-262-3453.

June 27-July 1, 1998

Plant Biology '98 Madison, Wisconsin

The American Society of Plant Physiologists Annual meeting is scheduled "back to back" with the 1998 Arabidopsis meeting. Contact: Susan Chambers, 15501 Monona Drive, Rockville, MD 20855; 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>.

JULY

July 1-3, 1998

8th Spanish Conference on Nitrogen Fixation Pamplona, Spain

Contact: Cesar Arrese-Igor, Department Ciencias del Medio Natural, University Publica de Navarra, Campus de Arrosadia, E-31006 Pamplona, Spain; phone +3448-169119, fax 3448-169122, e-mail cesarai@upna.es.

July 7-10, 1998

25th Annual Meeting: Plant Growth Regulation Society of America Chicago, Illinois

For information contact: Dr. Warren Shafer, Abbott Laboratories, Agricultural Research Center, 6131 RFD (Oakwood Road), Long Grove, IL 60047; telephone 847-367-2654, fax 847-367-2913.

July 12-17, 1998

IVth International Symposium on Cytochrome P450 Biodiversity and Biotechnology Strasbourg, France

Information concerning this meeting and second circular can be obtained by e-mail at: P450-98@ibmp-ulp.u-strasbg.fr. Information is also available from the web P450 page: <http://www.icgeb.trieste.it/p450/>.

July 20-24, 1998

The Supporting Roots: Structure and Function A Conference Sponsored by the University of Bordeaux, Bordeaux, France

Abstract Deadline: February 1, 1998. Contact: Alexia Stokes, Laboratoire de Rhéologie du Bois de Bordeaux, Domaine de L'Hermitage, B.P. 10, 33610 Cestas Gazinet, France; telephone +33 5 57 97 91 04; fax +33 5 56 68 07 13, e-mail stokes@lrb3.pierroton.inra.fr.

July 22-24, 1998

Carbohydrate Metabolism in Plants, the Pathways and Their Control

A meeting IN MEMORIAM to honour

Professor T. ap Rees

Queens College, Cambridge, United Kingdom

Organizers: Dr. M. M. Burrell, Professor J. A. Bryant, Dr. N.J.Kruger. For further information, contact: Dr. M. M. Burrell, Advanced Technologies, Cambridge, Science Park, Cambridge, UK. CB4 4WA; e-mail mmb.atc@dial.pipex.com.

July 26-31, 1998

1998 Phytochemical Society of North America Conference

Pullman, Washington

Contact: Norman G. Lewis, Institute of Biological Chemistry, 467 Clark Hall, P.O. Box 646340, Pullman, WA 99164-6340; telephone 509-335-3412, (ask for Hiroko), fax 509-335-7643, e-mail lewisn@wsu.edu.

AUGUST

August 9-14, 1998

Annual Meeting and Exhibits

Society for Industrial Microbiology

Adams Mark Hotel, Denver, Colorado

For more information, please contact the (SIM) office at 703-691-3357. Visit the SIM website at <http://www.simhq.org> or e-mail info@simhq.org.

August 9-14, 1998

11th International Workshop on

Plant Membrane Biology

Cambridge, United Kingdom

Contact: Dr. Mark Tester, Department of Plant Sciences, University of Cambridge, Downing St., Cambridge, CB2 3EA, U.K.; telephone + 44 1223 333918, fax + 44 1223 333953, e-mail plant-nut@lists.cam.ac.uk.

August 13-17, 1998

16th International Conference on

Plant Growth Substances

Makuhari Messe, Chiba, Japan

Organizer: Nobutaka Takahashi. For Information contact: <http://frpphf.riken.go.jp/IPGSA/IPGSA98.html>, or Dr. Yuji Kamiya, Plant Hormone Function, FRP RIKEN, Hirosawa 2-1, Wako-shi, Saitama 351-01, Japan; e-mail ykamiya@postman.riken.go.jp, fax +81-48-462-4716.

August 17- 21, 1998

Sixth International Symposium on Genetics

and Molecular Biology of Plant Nutrition

Elsinore, Denmark

For information contact: Arne Jensen, Plant Biology and Biogeochemistry Department, Riso, National Laboratory, P.O. Box 49, Building 330, DK - 4000, Roskilde, Denmark; e-mail arne.jensen@risoe.dk or see <http://www.risoe.dk>.

SEPTEMBER

September 1-5, 1998

Cell Walls '98

8th International Cell Walls Meeting

John Innes Centre, Norwich, UK

Scientific Organizers: Keith Roberts, Maureen McCann, and Keith Waldron.

For a copy of the first circular please contact the symposium secretary, Mrs. Gay Adams, at e-mail gay.adams@bbsrc.ac.uk, fax 44-1603-501771, telephone 44-1603- 452571.

September 13-16, 1998

The Phytochemical Society of Europe

Biologically Active Polysaccharides

Oslo, Norway

Paper deadline: May 1988. Contact: Professor B. S.

Paulsen, Farmasoytisk, avd c, Postboks 1068 -

Blindern, 0316 Oslo, Norway; telephone 47 2285

6572, fax 47 2285 4402, e-mail

b.s.paulsen@farmasi.uio.no.

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:
Estella Coley, ASPP headquarters, 15501 Monona Drive, Rockville, MD 20855-2768

LAST NAME	TITLE	FIRST NAME	INITIAL
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I am seeking the following position (check all that apply):

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| <input type="checkbox"/> Academic | <input type="checkbox"/> Government | <input type="checkbox"/> USA only | <input type="checkbox"/> Outside USA |

US citizen? Yes No **Date available:** _____

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 Ms. 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 including 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.)

Assistant Professor University of Arkansas, Fayetteville (Received 10/10)

Research/teaching, 12-month, tenure-track position is available at the University of Arkansas-Fayetteville campus. Plan and conduct basic/applied physiological research on herbicides used in Arkansas crops. Research will include plant biochemistry/metabolism to understand and develop novel strategies for management of weeds in crops. Knowledge of molecular strategies and plant biochemistry for weed management and crop physiological tolerance to herbicides desirable for interactions with weed scientists and crop physiologists in the Department. Expected to develop strong graduate program in biochemical and biotechnology aspects of weed physiology. Teaching responsibilities may include introductory weed science, crop metabolism or biotechnological strategies for weed control. Must provide effective liaison with scientists from other disciplines, industry representatives, and producer organizations. Requires a Ph.D. in weed science or related discipline with a strong grounding in biochemical aspects of herbicide activities and genetic regulation. Must take a team approach to problem solving and understand the Land Grant mission of teaching, research and service. Starting date January 1, 1998 or when a suitable candidate is available. Submit letter of application

including goals, resume, academic transcripts, and three letters of reference by November 1, 1997 to: Dr. Derrick M. Oosterhuis, Department of Agronomy, 276 Altheimer Drive, Fayetteville, AR 72701; telephone 501-575-3979, e-mail oosterhu@comp.uark.edu. EOE/AA.

Assistant/Associate Professor University of Kentucky, Lexington (Received 10/15)

The Horticulture and Landscape Architecture Department at the University of Kentucky seeks applicants for a 12-month, tenure-track, research/teaching faculty position. The successful candidate must develop a basic research program utilizing molecular genetics or cellular biology to address problems and opportunities important to Kentucky horticulture. The applicant is expected to secure outside funding, publish research in refereed journals, and foster intra- and interdepartmental research. Teaching a graduate level course in the incumbent's area of expertise and advising graduate students are expected. A Ph.D. in horticulture, molecular genetics, plant physiology, plant biochemistry, or a related plant science field with an emphasis in molecular biology or genetics is required. Educational background and/or experience with horticultural crops is desirable. The individual should possess the ability to function within a team and to communicate effectively. Applications will be accepted through December 15, 1997 or until a

suitable applicant is found. To apply, send a letter highlighting your education, experience, and interests, a resume, transcripts, and the names and addresses of five referees to: Dr. Dewayne L. Ingram, Chair, Department of Horticulture and Landscape Architecture, University of Kentucky, Lexington, KY 40546-0091; telephone 606-257-1601.

Project Leader DEKALB Genetics Corporation Mystic, Connecticut (Received 10/15)

DEKALB Genetics Corporation, the fastest growing agricultural seed company in the U.S., has a career opportunity for an innovative scientist in Corn Transformation research. The successful candidate will design, direct and implement a research project relating to manipulating, integration and expression of transgenes in corn. Candidates should have a Ph.D. in molecular biology plus postdoctoral experience and a background in plant transformation. The successful candidate will be located at DEKALB's biotechnology research facility in Mystic, CT, a scenic shoreline community located on Long Island Sound halfway between New York and Boston. For more information on DEKALB, visit our web site at <http://www.dekalb.com>. Please mail your resume and three professional references to: DEKALB Genetics Corporation,

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*.

Human Resources/TTD#1, 62 Maritime Drive, Mystic, CT 06355-1958. EOE/AA.

Instructor

**Vassar College, Poughkeepsie, New York
(Received 10/28)**

The Biology Department of Vassar College is looking for a qualified person for a one-semester leave replacement position to teach a sophomore/junior level course on plant physiology for the spring semester (January to May, 1998). The course involves 150 minutes of lecture (two 75-minute or three 50-minute periods) plus one 4-hour lab per week. Ph.D. or ABD required. Any interested persons are invited to visit the biology department web site at <http://vassar.edu>. Please send inquiries and a list of references to: Leathem Mehaffey, III Chair of Biology Box 251 Vassar College 124 Raymond Avenue, Poughkeepsie, NY 12604-0251, or e-mail to mehaffey@vassar.vassar.edu. Vassar is an equal opportunity employer and encourages applications from women and minorities.

Faculty Positions

**Rutgers University, Newark, New Jersey
(Received 10/31)**

Applications are invited for two tenure-track faculty positions in the Department of Biological Sciences. Successful candidates are expected to develop and maintain active research programs and to teach on both the graduate and undergraduate levels. **Physiological Ecologist:** an ecologist with a focus on physiological processes as they affect biotic interactions from the individual to the community levels. We are particularly interested in individuals with interdisciplinary research interests, such as restoration ecology or conservation ecology. **Cell Biologist:** a cell biologist to complement interdisciplinary research programs in protein sorting, ion transport, and cell motility. The successful candidate will have the opportunity to participate in the NSF-sponsored program in cellular and molecular biodynamics. Applications will be reviewed beginning December 15, 1997. Send curriculum vitae and three letters of recommendation to: Dr. Edward G. Kirby, Chairman, Department of Biological Sciences, Rutgers University, 101 Warren St., University Heights, Newark, NJ 07102. Visit our web site at <http://silk.rutgers.edu/>. Rutgers University is an equal opportunity employer.

**Plant Transformation Specialist
Monsanto Company, St. Louis Missouri
(Received 10/31)**

A position is available immediately for the production of transgenic corn and related responsibilities in support of nutritional improvement programs at Monsanto's Life Sciences Research Facility in St. Louis, Missouri. The individual will work within a large functional group of transformation specialists, and will be responsible for successfully meeting corn transformation needs for the nutrition sector. The successful candidate must have excellent communication skills, supervisory experience, and the ability to work well in a team-based

research atmosphere. A B.S. or M.S. degree in biological sciences or a related field and at least three years of experience in plant transformation are required. Preference will be given to individuals with significant hands-on experience with both free DNA and *Agrobacterium*-mediated transformation of monocot species, particularly cereal crops. Applications will be accepted until the position is filled. Monsanto offers a salary commensurate with experience, excellent benefits, and opportunities for professional growth. Send resume and names/addresses of at least three references to: Ms. Barbara Rhodes, 700 Chesterfield Pkwy, N., Monsanto, Mail Zone GG4C, St. Louis, MO 63198; telephone 314-737-7274, fax 314-737-6567, e-mail barbara.d.rhodes@monsanto.com. Monsanto is an equal opportunity employer M/F/D/V.

**Charles Babcock Chair of Botany
Wake Forest University, Winston-Salem
North Carolina
(Received 10/31)**

The Department of Biology, Wake Forest University, invites applications and nominations for the Charles Babcock Chair of Botany. Applicants and nominees are expected to have an internationally recognized research program. Research interests and teaching philosophy should complement the existing departmental strengths as described at our web site (<http://www.wfu.edu/Academic-departments/Biology/faculty/index.html>). Responsibilities will include teaching undergraduate and graduate courses, advising M.S. and Ph.D. students, and maintaining an active research program. Applicants should send statements of teaching philosophy and research interests, a curriculum vitae and names and addresses of three referees to: Dr. Gloria K. Muday, Chair, Charles Babcock Chair of Botany Search Committee, Department of Biology, Wake Forest University, Winston-Salem, NC 27109-7325. Review of applications will begin on January 15, 1998. Wake Forest University is an equal employment opportunity employer and is strongly committed to increasing the diversity of its faculty.

**Plant Developmental Biologist
East Tennessee State University, Johnson City
(Received 11/03)**

East Tennessee State University Biological Sciences Department, <http://www.etsu-tn.edu/biology> invites applications for a tenure-track position at the Assistant Professor level, starting in August, 1998. A Ph.D. with specialization in Plant Developmental Biology using modern research approaches and a demonstrable commitment to teaching and research are required. Teaching duties include participation in the general biology sequence, with courses in plant development and diversity. The successful candidate will be encouraged to develop an advanced course in their area of interest and will be responsible for developing an active research program that includes B.S. and M.S. Applications with individuals with broad botanical training are especially encouraged. Send curriculum vitae, transcripts, statements of teaching and research interests and three letters of recommendation by

February 1, 1998 to: Dr. Cecilia McIntosh, Search Committee, Biological Sciences Dept., ETSU, Johnson City, TN 37614-0703; telephone 423-439-5838, fax 423-439-5958, e-mail mcintosh@access.etsu-tn.edu. (AA/EOE).

**Assistant Specialist
The Plant Gene Expression Center
University of California, Berkeley
(Received 11/04)**

An assistant specialist position is available to investigate the action of plant disease resistance genes. The successful candidate will isolate disease resistance genes and determine the relationship between genomic organization and gene expression. A Ph.D. in plant biology, genetics, or related field is required. Experience in genomics and molecular biology is also essential. Demonstrated experience in large insert library construction and AFLP analysis required. Send curriculum vitae and names of three referees, by January 5, 1998, to: Dr. Barbara Baker, Plant Gene Expression Center, 800 Buchanan Street, Albany, CA 94710; fax 510-559-5678. The University of California is an equal opportunity/affirmative action employer.

POSTDOCTORAL POSITIONS

**Postdoctoral Position
University of California, Riverside
(Received 10/03)**

A postdoctoral position is available to study the cell biology of pollen tube/stylar interactions in lily and *Arabidopsis*. We are particularly interested in the effects of adhesion on the tube cell cytoskeleton/plasma membrane/wall interface. We have developed an in vitro functional adhesion assay for use in these studies. Experience with immunological techniques at the LM and TEM level is desirable. Send curriculum vitae, a brief statement of research experience and interests, plus the names and addresses of three references to: Elizabeth M. Lord, Botany and Plant Sciences, University of California, Riverside, CA 92521-0124, e-mail lord@ucr1.ucr.edu, web site <http://cnas.ucr.edu/~bps/homepage.htm>.

**Postdoctoral Fellow
University of Lund, Lund, Sweden
(Received 10/06)**

One postdoctoral fellow is required for a project concerning molecular studies on aquaporins (water channels) in plants. Applicants will work at the Department of Plant Biochemistry, Lund University, in the south of Sweden as part of a dynamic Swedish network including five laboratories. Work in Lund will focus on the structure and function of plasma membrane aquaporins (Plant Cell 8: 1181-1191). Competence in biochemistry and particularly in molecular biology is required. Applicants should submit a full curriculum vitae including a list of publications and the names and addresses of two referees. Applications should be sent to: Dr. Per Kjellbom, Department of Plant Biochemistry, Lund University, P.O. Box 117, S-221 00 Lund, Sweden; e-mail per.kjellbom@plantbio.lu.se.

Postdoctoral Fellow
University of Oregon, Eugene
(Received 10/06)

A postdoctoral position is available immediately to study the targeting of proteins to the chloroplast thylakoid membrane. The successful applicant will have the opportunity to study a unique collection of targeting mutants with a combination of biochemical and genetic methods. A background in membrane protein biochemistry is preferred. Send or e-mail a curriculum vitae and the names, phone numbers, and e-mail addresses of three references to: Dr. Alice Barkan, Institute of Molecular Biology, University of Oregon, Eugene, OR 97403; e-mail abarkan@molbio.uoregon.edu.

Postdoctoral Position
Ohio State University, Columbus
(Received 10/07)

A postdoctoral position is available that focuses on the regulation by gravity of cell growth and organization in tip-growing moss cells via ground and spaceflight research. Key questions are the relationships between light and gravitropism and the control of organelle position by gravity and the cytoskeleton. A background in cell biology and/or plant physiology is preferred. This position requires occasional travel and the preparation and analysis of a NASA Shuttle experiment. Send a curriculum vitae and names of references to Fred Sack, Plant Biology, Ohio State University, 1735 Neil Avenue, Columbus OH 43210; telephone 614-292-0896, fax 614-292-6345; e-mail sack.1@osu.edu, web site <http://fredsack.biosci.ohio-state.edu/sacklab.htm/>.

Technician and Postdoctoral Research Associate
Northern Arizona University, Flagstaff
(Received 10/13)

A postdoctoral and a technician position are available to study mechanisms involved in heavy metal accumulation in plants. Work will focus on an investigation of the molecular and physiological mechanisms of Ni hyperaccumulation by *Thlaspi goesingense*. The positions require a background in plant physiology and molecular biology. Work will be carried out within a new phytoremediation group being established at Northern Arizona University that will focus on the development of phytoremediation crops using modern molecular approaches. Applicants should provide a curriculum vitae and three letters of reference to: David E. Salt, Chemistry Department, Northern Arizona University, Flagstaff, AZ 86011-5698, telephone 520-523-7079, e-mail salt@aesop.rutgers.edu.

Postdoctoral Position
University of Karlsruhe, Karlsruhe, Germany
(Received 10/16)

A postdoctoral position is available immediately at the University of Karlsruhe (Germany) to study membrane transport proteins (mainly heterologously expressed ion channels) in the baker's yeast (*S. cerevisiae*). The ideal candidate has a solid background in electrophysiology (especially patch clamp) and is interested in yeast genetics/molecular biology, or vice versa. Salary is according to the German pay scale BAT-IIa (70-

100kDM, depending on age and family status). Graduate students with strong interest in yeast electrophysiology/molecular biology are also welcome to apply. Salary for graduate students is 50% of BAT-IIa. Send short applications by fax or e-mail to: PD Dr. Adam Bertl, Botanisches Institut, Lehrstuhl I Universität Karlsruhe, Kaiserstrasse 2, D-76128 Karlsruhe, Germany; fax 49-721-608-4193, e-mail adam.bertl@bio-geo.uni-karlsruhe.de.

Postdoctoral Research Associate
USDA, ARS, NCAUR, Peoria, Illinois
(Received 10/20)

Incumbent will characterize the developmental and tissue-specific expression of a maize kernel-specific glutamine synthetase. Candidates should possess experience in plant promoter analysis. Ph.D. should have been awarded within the last 4 years. Salary commensurate with experience (\$37,507 - \$58,422 per year). Benefits are available. For information, contact Dr. Michael J. Muhitch at 309-681-6368 or by e-mail muhitchm@mail.ncaur.usda.gov. Applications should be sent to: Dr. Michael J. Muhitch, Mycotoxin Research Unit, NCAUR/ARS/USDA, 1815 N. University St., Peoria, IL 61604. USDA/ARS is an equal opportunity employer.

Postdoc Fellowships in Plant Biology
Lund University, Lund, Sweden
Swedish University of Agricultural Sciences
Svalöv, Sweden
(Received 10/21)

Applicants are invited to apply for two postdoctoral fellowships within the Swedish Strategic Network for Plant Biotechnology. The fellowships are for 2 years. The first postdoctoral fellow will join a project concerning molecular studies on aquaporins (water channels), especially the structure and function of plasma membrane aquaporins (Plant Cell 8: 1181-1191). Competence in biochemistry and particularly molecular biology is required. Applicants should submit a full curriculum vitae, including a list of publications, and the names and addresses of two referees. Applications should be sent to: Dr. Per Kjellbom, Department of Plant Biochemistry, Lund University, P.O. Box 117, S-221 00 Lund, Sweden; e-mail per.kjellbom@plantbio.lu.se. The second postdoctoral fellow will be involved in studies on membrane lipids and fatty acid metabolites involved in signal transduction during stress responses. In this research program genes encoding enzymes involved in fatty acid modifications have recently been cloned, and the involvement of these genes and corresponding enzymes in biotic stress responses will be investigated. Applicants should submit a full curriculum vitae, including a list of publications and the names and addresses of two referees. Applications should be sent to: Dr. Sten Stymne, Department of Plant Breeding Research, the Swedish University of Agricultural Sciences, S-268 31 Svalöv, Sweden; e-mail Sten.Stymne@vf.slu.se.

Postdoctoral Positions
University of California, Berkeley
(Received 10/27)

Two postdoctoral positions are available to study protein phosphatases involved in stress signal transduction in higher plants. Background in molecular cloning is required and experience in protein biochemistry is desirable. Alternatively, candidates trained in electrophysiology (with techniques such as patchclamping) will also be considered. Interested individuals are encouraged to send e-mail directly to: Dr. Sheng Luan at sluan@nature.berkeley.edu.

Postdoctoral Research Position
USDA, Beltsville, Maryland
(Received 10/28)

A postdoctoral research position is available for two years at the USDA in Beltsville, Maryland. The candidate must have knowledge and experience in molecular biology particularly cloning and RNA analysis. The incumbent will study the replicase, coat protein, and antibody genes, develop transgenic plants using tissue culture techniques, and test for virus resistance. Send resume and three references to: Kathy Kamo, Floral & Nursery Plants Research Unit, B-010A Room 238 BARC West, Beltsville, MD 20705.

Assistant Specialist
The Plant Gene Expression Center
University of California, Berkeley
(Received 10/28)

An assistant specialist position is available for two years to investigate the N gene-mediated signal transduction pathway for tobacco mosaic virus resistance in Arabidopsis and tomato. Qualifications: Ph.D. in molecular biology, genetics, or related field. Experience with Arabidopsis and tomato transformation, insertional mutagenesis, and molecular biological techniques required as well as knowledge of transposon and other chemical based mutagenesis. Send curriculum vitae and names of three referees, by January 5, 1998 to: Dr. Barbara Baker, Plant Gene Expression Center, 800 Buchanan St., Albany, CA 94710; fax 510-559-5678. The University of California is an equal opportunity/affirmative action employer.

Postdoctoral Fellowship
Waksman Institute, Rutgers University
Piscataway, New Jersey
(Received 10/29)

A postdoctoral research position is available to study signal transduction during induction of disease resistance to viral infections of tobacco and Arabidopsis. Genetic, molecular and biochemical approaches are being utilized. Emphasis is being placed on defining components of these pathways, particularly the salicylic acid-mediated signaling pathway (PNAS, 1996, 93:14972; Plant J., 1996, 10:1089; Plant Cell, 1997, 9:809; Plant J., 1997, 11:301; Plant J., 1997, 11:747; Plant J., 1997, 11:993; Plant Physiol., 1997, 113:1319; Genes & Dev., 1997, 11:1621; Trends Plant Sci., 1997, 2:266). Applicants should have research experience in genetics, molecular biology, and/or biochemistry. Send a curriculum vitae, a cover letter detailing experience, and three letters of recommendation to: Daniel

Klessig, Waksman Institute, Rutgers University, 190 Frelinghuysen Road, Piscataway, N. J. 08854. Rutgers University is an equal opportunity/affirmative action employer.

**Postdoctoral Position
Texas Tech University, Lubbock
(Received 10/30)**

A postdoctoral research associate position is available in January, 1998, or when a suitable candidate is identified. The individual will conduct research on gene expression under multiple stresses and identification of genes controlling mite resistance in maize. Candidate should have a Ph.D. and a strong background in molecular biology. Experience in differential display and cDNA cloning methods is desirable. Send a statement of research interest, copies of published articles, and curriculum vitae including names, telephone numbers and e-mail addresses of at least three references to: Prof. Henry T. Nguyen, Plant Molecular Genetics Laboratory, Texas Tech University, Lubbock, Texas 79409-2122; telephone 806-742-1622, fax 806-742-0775, e-mail bwhtn@ttacs.ttu.edu.

**Postdoctoral Positions
Texas Tech University, Lubbock
(Received 10/30)**

Three postdoctoral positions are available in January, 1998, or when suitable candidates are identified. Research projects include (1) molecular mapping of insect and drought tolerance in corn, (2) development of marker-assisted selection to combine drought and insect resistance in sorghum, and (3) testing methods for detection and introgression of novel QTLs from exotic germplasm to enhance yield and stress adaptation in sorghum. Candidates should have a Ph.D. with a strong background in genetics, molecular marker techniques, and statistics. Experience in high-resolution genetic mapping and physical mapping will be an advantage depending on the specific position. Send statement of research experience and interests, copies of published articles, curriculum vitae and three references to: Prof. Henry T. Nguyen, Plant Molecular Genetics Laboratory, Texas Tech University, Lubbock, Texas 79409-2122; telephone 806-742-1622, fax 806-742-0775, e-mail bwhtn@ttacs.ttu.edu.

**Postdoctoral Position
USDA, ARS, Oxford, Mississippi
(Received 10/31)**

A one-year position is available (GS-11; \$38,593 plus benefits) beginning early 1998 to determine the molecular target site of certain natural phytotoxins and their synthetic analogs. The applicant should have a broad background in plant physiology and a willingness to be flexible. Knowledge of the phytotoxin mode of action is desirable. Submit resume, cover letter discussing fit with the qualifications sought, and the names of three references with e-mail addresses and telephone numbers to: S. Duke, USDA, ARS, P. O. Box 8048, University, MS 38677; e-mail sduke@ag.gov. For lab information see <http://www.olemiss.edu/depts/ncdnp/usda/>.

**Postdoctoral Position
University of Georgia, Athens
(Received 11/03)**

A postdoctoral position is available to study tomato spotted wilt tospovirus (TSWV) glycoprotein processing in planta, using reporter genes, and TSWV binding in the midgut of the western flower thrips. Initial appointment for 1 year with availability of second year dependent on progress. Incumbent must have a Ph.D. and relevant experience in virology, molecular biology and/or cell biology. A curriculum vitae, a summary of incumbent's research approach to the project (not to exceed two pages), and three letters of reference should be provided by December 1 to: John L. Sherwood, Department of Plant Pathology, University of Georgia, Athens, GA 30602-7274; e-mail sherwood@uga.cc.uga.edu. UGA is an equal opportunity/affirmative action employer.

**Katherine Esau Postdoctoral Fellowships
University Of California, Davis
(Received 11/03)**

Applications and nominations are invited for a Katherine Esau Postdoctoral Fellowship that will be awarded to outstanding young scientists interested in developing careers in structural aspects of plant biology, including studies in which plant structure is integrated with function. Esau fellowships will be awarded for a period of two years to enable successful candidates to work under the mentorship of a University of California, Davis, faculty member. Applications/nominations should identify an appropriate faculty mentor(s) and include a curriculum vitae of the candidate, reprints of published works, and a brief proposal of the research that would be carried out under this program. The names and addresses of three references are also required. Requests for information regarding these fellowships should be addressed to: Dr. William J. Lucas, Chair, Faculty Advisory Committee, Esau Fellowships Program, Section of Plant Biology, Division of Biological Sciences, University of California, Davis CA 95616. Fellowships will be awarded on a bi-annual basis. Deadlines for this ongoing program are June 1 and December 1. The University of California is an equal opportunity employer.

**Postdoctoral Position
Texas A&M University, Lubbock
(Received 11/06)**

A postdoctoral position is available to investigate the effects of multiple stresses, especially moisture, aphids, and mites, on plant growth and yield of sorghum and corn under the semiarid conditions of the Texas High Plains. Working experience with infrared radiometers, and measurements of photosynthesis and leaf water potential would be beneficial. The application deadline is December 31, 1997. Submit a curriculum vitae, a statement of research interests, academic transcripts, and the names and addresses of three references to: Dr. Tom Archer, Texas A&M Research and Extension Center, Route 3, Box 219, Lubbock, TX 79401-9757. Contact Dr. Henry Nguyen at bwhtn@ttacs.ttu.edu for more information.

**Postdoctoral Position
Texas A&M University, College Station
(Received 11/07)**

A postdoctoral position is available to genetically engineer cotton so as to reduce substantially or eliminate completely gossypol from cottonseed. The approach involves utilizing tissue-specific promoters and antisense technology to selectively knock out expression of the gene that encodes d-cadinene synthase, a key enzyme involved in the biosynthesis of gossypol. The incumbent will join an ongoing research project. Experience in plant tissue culture, transformation, and/or molecular biology is desired. Send curriculum vitae detailing experience, a statement of research interests and career goals, and names and phone numbers of three references to: Dr. Keerti S. Rathore, Crop Biotechnology Center, Texas A&M University, College Station, TX 77843-2123; e-mail rathore@genome.tamu.edu.

**Postdoctoral Position
Texas A&M University, College Station
(Received 11/07)**

A postdoctoral position is available to genetically engineer soybean to produce antibodies for immunotherapy. The research is a collaborative project with the Department of Veterinary Pathobiology to utilize a novel approach to prevent neonatal colibacillosis in bovine calves by delivering antibodies produced in developing soybean seeds. A strong background in tissue culture/transformation of important crop(s) is required. Experience in soybean tissue culture/transformation would be advantageous. Send curriculum vitae detailing experience, a statement of research interests and career goals, and names and phone numbers of three references to: Dr. Keerti S. Rathore, Crop Biotechnology Center, Texas A&M University, College Station, TX 77843-2123; e-mail rathore@genome.tamu.edu.

**Postdoctoral Position
Purdue University, West Lafayette, Indiana
(Received 11/10)**

A postdoctoral position is available immediately for the analysis of temporal regulation in the unicellular, diazotrophic cyanobacterium *Cyanothece* sp. A Ph.D. is required, and experience in molecular biology is highly desirable; experience in photosynthesis and/or nitrogen fixation will also be considered favorably. Metabolic processes in this cyanobacterium display circadian rhythms, and oxygen-evolving photosynthesis is temporally regulated from nitrogen fixation. Objectives are to determine how photosynthesis is downregulated and how the periodicities of the different metabolic processes are regulated. Send curriculum vitae, research interests, and names and addresses of three references to: Dr. Louis Sherman, Purdue University, Department of Biological Sciences, Lilly Hall, West Lafayette, IN 47907; e-mail lsherman@bilbo.bio.purdue.edu, fax 765-496-1495.

**RESEARCH/TECHNICAL POSITIONS
(Non-Ph.D.)**

**Faculty Research Assistant
University of Maryland, Cambridge
(Received 10/08)**

A full-time position is available November 15, 1997. Duties will include culturing microalgae and assistance with experimentation on photosynthesis involving the use of membrane inlet mass spectrometry and fluorometry. Minimum requirement is a bachelor's degree in biological, chemical, or physical sciences. A master's degree in plant physiology or marine science and/or 3+ years of related experience is desirable. Salary commensurate with experience. Send resume and names, addresses, and telephone numbers of three references to: FRA Search-2, Horn Point Laboratory, PO Box 775, Cambridge, MD 21613; e-mail kana@hpl.umces.edu. Institution home page <http://www.hpl.umces.edu>. Review of applications to begin October 20, 1997. AA/EOE.

Research Associates

**DEKALB Genetics Corporation
Mystic, Connecticut
(Received 10/15)**

DEKALB Genetics Corporation, the fastest growing agricultural seed company in the U.S., has career opportunities for innovative scientists in Corn Transformation research. Successful candidates will develop new technologies related to corn transformation. Candidates should have an M.S. plus two years research experience. Experience with molecular biology, cereal tissue culture, and transformation preferred. The successful candidates will be located at DEKALB's biotechnology research facility in Mystic, CT, a scenic shoreline community located on Long Island Sound halfway between New York and Boston. For more information on DEKALB, visit our web site at <http://www.dekalb.com>. Please mail your resume and three professional references to: DEKALB Genetics Corporation, Human Resources/TTD#2, 62 Maritime Drive, Mystic, CT 06355-1958. EOE/AA.

Research Position

**Monsanto, St. Louis, Missouri
(Received 10/31)**

A position is available immediately to support nutritional improvement programs at Monsanto's Life Sciences Research Facility. Major responsibilities: Prepare media and develop and maintain seed pod cultures, design and implement experiments to make improvements on pod culture procedures, critically analyze and communicate results to project team members and contribute to project planning. Qualifications/competencies: A highly motivated person with a BS or MS degree in plant physiology or biological sciences. A qualified candidate should have a minimum of 2 years of working experience in plant tissue culture. Preference will be given to individuals with experience in organ and/or pod seed culture, whole plant biology, and radioactive labeling. A background in plant physiology and plant metabolic pathways is desirable. The candidate should have a strong record of independent productivity, good organizational

skills, excellent communication skills, computer competencies, critical thinking skills, and an ability to work well in a team-based research atmosphere. Send resume and three references to: Ms. Barbara Rhodes, 700 Chesterfield Pkwy, N., Monsanto, Mail Zone GG4C, St. Louis, MO 63198; telephone 314-737-7274, fax 314-737-6567, e-mail barbara.d.rhodes@monsanto.com. Monsanto is an equal opportunity employer M/F/D/V

Research Biologist

**Monsanto Company, St. Louis, Missouri
(Received 10/31)**

The Nutrition and Consumer Product Biotechnology group of Monsanto Life Science Company has an immediate opening for a research biologist position. Major responsibilities: The successful candidate will be responsible for Arabidopsis mutant screening, transformation, and analyzing transgenic plants. Qualifications: The candidate should have a BS or MS degree in biology or a related discipline with at least two years of lab experience. Experience with Arabidopsis and plant tissue culture is required. Additional experience in molecular biology techniques is desirable but not necessary. Interested applicants should send curriculum vitae and references to: Mrs. Barbara Schiermeyer, AA3E, 700 Chesterfield Parkway North, St. Louis, MO 63198; telephone 314-737-6221, fax 314-737-5179, e-mail barbara.a.schiermeyer@monsanto.com.

ASSISTANTSHIPS, FELLOWSHIPS, INTERNSHIPS, ETC.

**Two Graduate Student Research Assistantships
Texas Tech University, Lubbock
(Received 10/23)**

Two research assistantships at the M.S. or Ph.D. level are available January 1, 1998, to conduct research on the physiological, biochemical, and molecular aspects of the control of starch accumulation in cotton roots and stems. The successful applicants will be associated with a study involving collaboration between a physiologist/biochemist (A.S. Holaday), an agronomist/physiologist (D. Krieg), and a molecular biologist (R. Allen). The study provides an excellent opportunity for students to become familiar with how an agronomic problem can be investigated at the whole-plant, cellular, and molecular levels. The assistantships are \$14,000 for M.S. and \$15,000 for Ph.D. students per year for 2 years with plans to request additional funding. To apply, send a letter indicating your research interests, a curriculum vitae including GRE scores, graduate, and/or undergraduate GPA, and TOEFL scores, if an applicant's first language is not English, and the names, addresses, and phone numbers of three references to: Dr. A. Scott Holaday, Department of Biological Sciences, Texas Tech University, Lubbock, TX 79409-3131. For further information, you may call Dr. Holaday at 806-742-2657, fax 806-742-2963, e-mail bdash@ttacs.ttu.edu or Dr. D. Krieg at 806-742-1631, e-mail dkrieg@ttu.edu. Applications will be accepted until the assistantships are appointed, but it is advisable to apply before February 1, 1998.

**Graduate Research Assistantship
Texas Tech University, Lubbock
(Received 10/30)**

Graduate research assistantships are available to support graduate studies toward a Ph.D. degree at Texas Tech University. Research projects include studies of gene expression under multiple stresses and identification of genes controlling mite resistance in maize, high-resolution genetic mapping and physical mapping of drought tolerance QTLs, and molecular breeding for drought and insect tolerance in cereal crops. Interested students should submit a statement of goals and research interest, a resume including academic experience and three references, GRE score, and college transcripts. Annual stipends will range from \$12,000 to \$14,000. Outstanding students will qualify for a fellowship supplement at \$3,000 per year. Preference will be given to U.S. citizens or permanent residents due to source of funding. Send application to Prof. Henry T. Nguyen, Plant Molecular Genetics Laboratory, Department of Plant and Soil Science, Texas Tech University, Lubbock, TX 79409-2122; telephone 806-742-1622, fax 806-742-0775, e-mail bwhtn@ttacs.ttu.edu.

**Graduate Research Assistantship
Texas Tech University, Lubbock
(Received 11/04)**

A graduate research assistantship is available for Ph.D. studies at Texas Tech University, in collaboration with the International Rice Research Institute (IRRI) located in the Philippines. The research project aims at improving drought tolerance in upland rice, with a focus on QTL and candidate gene approaches to the identification of key genes for osmotic adjustment. Interested students should submit a statement of goals and research interest, a resume including academic experience and three references, GRE scores, and college transcripts. Annual stipend is \$12,000 plus cost-of-living allowance for three months per year at IRRI. Outstanding students will qualify for a fellowship supplement at \$3,000 per year. U.S. citizenship is required due to source of funding. Send application to Prof. Henry T. Nguyen, Plant Molecular Genetics Laboratory, Department of Plant and Soil Science, Texas Tech University, Lubbock, TX 79409-2122; telephone 806-742-1622, fax 806-742-0775, e-mail bwhtn@ttacs.ttu.edu.

**Graduate Fellowships in Plant Biotechnology
Indiana University, Bloomington
(Received 11/07)**

Applications are invited for graduate fellowships in the Plant Biotechnology Training Program at Indiana University. This program is funded by the USDA National Needs Fellowship (NNF) Program and provides stipends of \$17,000 per year, plus a full tuition scholarship. NNF fellows may choose among seven plant biotechnology laboratories (directed by Carl Bauer, Mark Estelle, Roger Hangarter, Roger Innes, Cheng Kao, Jeffrey Palmer, and Miriam Zolan). These seven laboratories encompass a broad range of areas in plant biotechnology, including disease resistance genes, plant-virus and plant-bacteria interactions,

genome evolution, hormones and development, plant responses to light and gravity, carbon assimilation, DNA repair and meiosis, and chlorophyll biosynthesis. For more details on our graduate training curriculum and research programs please visit our World Wide Web site (<http://www.bio.indiana.edu/>). For application materials contact: Ms. Gretchen Clearwater, National Needs Fellowships Program, Department of Biology, Indiana University, Bloomington, IN 47405; telephone 812-855-1861, fax 812-855-6705, e-mail biograd@bio.indiana.edu. Although NNF fellows must be US citizens or nationals, the Department of Biology also awards research assistantships on a competitive basis regardless of nationality. Indiana University is an equal opportunity/affirmative action institution.

**Undergraduate Summer Research Fellowships in "Radical" Biology
The Pennsylvania State University
University Park**

(Repeat)

Several undergraduate summer fellowships are available at Penn State to participate in an interdisciplinary research training program in Advanced Root Biology during June-July 1998. Our program is funded by the National Science Foundation and its goal is to train a new group of plant biologists capable of solving the unique conceptual and technical problems presented by plant roots. The undergraduate trainees will be active participants in our group effort, working directly with faculty, postdocs, and graduate students in a collaborative project of their choice. Projects are available in the following areas: root responses to nutrient stress; root exudates; biosynthesis and biological significance of root-specific secondary metabolites and proteins; mycorrhizal ecophysiology; root life span and turnover; biochemistry and molecular biology of root development; and root-insect interactions. Research facilities include state-of-the art equipment for plant molecular biology and biotechnology, a fluorescence microscopy and image analysis facility, a mini-rhizotron, etc. Financial support includes a \$2,500 stipend and \$600 for living expenses. Applicants please submit curriculum vitae, transcripts, and three letters of recommendation to: Dr. Hector E. Flores, 315 Wartik Laboratory, The Pennsylvania State University, University Park, PA 16802; telephone 814-865-2955, fax 814-863-7217, e-mail hefl.psu.edu. Women and minorities are especially encouraged to apply. The deadline for Summer Research Fellowship application is February 28, 1998 (available to U.S. citizens and residents only).

**Graduate Fellowships in "Radical" Biology
The Pennsylvania State University
University Park**

(Repeat)

Five graduate fellowships are available at The Pennsylvania State University to participate in an interdisciplinary research training program in Advanced Root Biology, starting Fall 1998. Our program is funded by the National Science Foundation and its goal is to train a new group of plant biologists capable of solving the unique

conceptual and technical problems presented by plant roots. The graduate fellows will be actively involved in the design and implementation of interdisciplinary research efforts, working directly with faculty, postdocs, and undergraduate graduate students in a collaborative project of their choice. Projects are available in the following areas: root architecture and nutrient stress; root exudates; biochemical and molecular regulation of root-specific metabolic pathways; control of root life span and turnover; cell and molecular biology of root development; root-insect interactions; and genetics of root resistance to salinity stress. Research facilities include state-of-the art equipment for plant molecular biology and biotechnology, a fluorescence microscopy and image analysis facility, a mini-rhizotron, etc. Financial support includes a multiyear stipend starting at \$16,500. Graduate student supported through this training grant could study in any of several graduate programs (Plant Physiology, Ecology, Biology, Plant Pathology, Genetics, Horticulture, Entomology, etc.). Applicants please submit curriculum vitae, transcripts, and three letters of recommendation to: Dr. Hector E. Flores, 315 Wartik Laboratory, The Pennsylvania State University, University Park, PA 16802; telephone 814-865-2955, fax 814-863-7217, e-mail hefl.psu.edu. Women and minorities are especially encouraged to apply. The deadline for applications is January 15, 1998 (available to U.S. citizens and residents only).

**Graduate Research Assistantships
Purdue University, West Lafayette, Indiana
(Repeat)**

Contact: Drs. Robert J. Joly (joly@hort.purdue.edu) or David Rhodes (rhodes@hort.purdue.edu); Center for Plant Environmental Stress Physiology, 1165 Horticulture Building, Purdue University, West Lafayette, IN 47907-1165; telephone 765-494-1300, fax 765-494-0391. Visit our web site at <http://www.hort.purdue.edu/cfpesp/>. (Details September/October 1997.)

**Undergraduate Research Internships in
Plant Molecular & Cellular Biology
University of Florida, Gainesville
(Repeat)**

For information contact: PMCB@gnv.ifas.ufl.edu. (Details September/October 1997.)



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