ASPP's INFORMATION REVOLUTION
The Challenge of Balancing Costs and Benefits

In my first President's Letter in the Nov/Dec 96 issue of this newsletter, I expressed the view that the main business of ASPP and its membership is information; we create it, we exchange it among ourselves, we disseminate it to others, and we archive it. In fact, science itself is the discovery and conveying of information. The rate at which research-based information is being generated continues to accelerate, but an even more profound recent change in science is the speed of dissemination and accessibility to information that we as research scientists have come to rely on. There is little doubt that our Society has been the leader in the plant biology community in responding to our community's demand for better information, delivered more quickly, and in more useful forms. Indeed, in the past year alone, ASPP began to expedite the mailing of all of our journals around the world; we instituted electronic submission, posting, and searching of annual meeting abstracts; we developed a web site that posts the membership directory, job opportunities, recent committee activities, and more; and perhaps most conspicuously, we created electronic versions of both *Plant Physiology* and *THE PLANT CELL* that will be network accessible beginning in February 1998.

Each of this year's new information services at ASPP that I mentioned above has a real dollar cost associated with it. For example, increased cost for expediting journal mailings was about $45,000 in FY 97, electronic abstracts added about $10 to everyone's registration fee at the annual meeting, and we anticipate the additional recurring annual costs associated with the electronic publication of our journals will be $128,000. Most of you are aware that about half of the over $4 million annual operating budget of ASPP is derived from institutional library subscriptions. At $1,300 for two of the top plant journals in the world, there is no question that our publications are a bargain to the institutions, particularly in comparison to those from commercial publishers. Now, for an additional $400, we are offering institutions a site license to the network versions of *Plant Physiology* and *THE PLANT CELL*. Thus, while we have done an excellent job of containing the cost of our journals, it needs to be clearly recognized that most of the costs of this year's new information services are captured by increased institutional subscription charges.

It is natural that as a publisher, ASPP focuses on the costs of the "information revolution" that are associated directly or indirectly with the production of our journals. However, since the overwhelming majority of us are associated in our professional lives with the institutions that purchase our journals, it is also important to be aware of our institutions' costs in dealing with the "information revolution".

continued on page 3

- Plant Biology '97 Revisited
- 1997 ASPP Award Recipients
- Plants for Lifesaving Vaccines
- Scenes from Plant Biology '97
TABLE OF CONTENTS

1  President's Letter

3  Membership News

4  Obituary

5  Recap of Plant Biology '97

6  ASPP 1997 Awards

9  Turning Point

16  New Members Joint Education Foundation Board

11  Public Affairs

14-16  Scenes from Plant Biology '97

17  ASPP Education Forum

18  Officers' Annual Duties

19  Gatherings

23  Jobs

Deadline for:
November/December 1997 ASPP NEWS: October 31, 1997

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

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My selection of this topic was somewhat influenced by a letter I received last week addressed to the University of Illinois faculty from the University Librarian, Robert Wedgeworth. He wrote, "During the next several years the University Library will undergo more significant change than it has experienced since the introduction of the on-line catalog in the late 1970's. These changes will reshape the University Library as you know it into an institution capable of serving a much broader set of information needs and services than are currently available." He went on to talk about the installation of 200 new Pentium workstations with printers, a significantly expanded set of on-line indexes, abstracts, and full-text services, and the design and installation of a completely new information gateway to the electronic library. As you might guess, it wasn't all good news. These new library services represent a new set of recurring costs for the library that are only partially funded by new dollars. Significant internal reallocations within the library were also required and these reallocations were led by a decrease in funds for the acquisition of journals and new book holdings. There is no doubt that other institutional libraries are facing very similar programmatic and financial challenges as they respond to the "information revolution".

In my view, ASPP should be proud of both what has been accomplished in information services to our membership and the leadership role that we have played in keeping plant biology in pace with the "information revolution". I am very pleased that so much of this has taken place in the year that I have been President. I feel very strongly that ASPP must now also become a leader in vigilantly assessing the importance and impact of each of our experiments. Some of the things that may be important initially may be less so in the near future. We must continually assess if we are adding value in proportion to cost that is incurred by our membership or our membership's institutional libraries. I am convinced that this year we headed off boldly in right direction but I am also wary that we could rapidly lose our way in this constantly changing arena.

I would like to close this, my final President's Letter, by thanking you for the opportunity to serve as president of our Society. It has been an exceptionally busy year in my life but also a very interesting year filled with new experiences and the opportunity to make many new acquaintances.

Depth and Strength of ASPP Members

ASPP's membership is composed of scientists from the academic, governmental, and industrial sectors, each of which brings different strengths and mind-sets to the Society. In turn, members from these sectors each benefit, perhaps in different ways. Concurrent with the trend of decreasing availability of research funds, academic/industrial/governmental collaborations are rising. And, with the advent of plant genetic engineering, plant scientists are seeing the fruits of their labors becoming applications and even products in much shortened time frames. Some hypotheses and dogmas can be directly addressed, and as is always the case in science, more interesting questions arise. Industrially generated products need thorough and often long-term multifaceted analysis which define ideal academic projects. This mutualism among academia, government, and industry can only increase or expand as genomics, functional and otherwise, takes off.

What can/does ASPP do to facilitate this mutualism? Membership in this society can help identify potential collaborators and provides a medium through which contact can be made and maintained. This occurs through its publications, annual and sectional meetings, directory, and web page. Career opportunities for those trained in plant physiology have broadened from the academic positions in classical plant biology departments to include those in other departments or programs such as molecular biology, genetics, biotechnology, and more. The time when making an industrial career choice was considered "selling out" is also over. Furthermore, the realization that all the basic plant physiology research that members of the society conduct is/should be pertinent to applied areas has been reinforced. With the spectra of using plants to produce therapeutics, plastics, and energy applications (i.e. ethanol), the need to understand the physiological limitations and possibilities of plants is essential.

The real strength of ASPP lies in the future united direction that the Society and its members chart. That, of course, is ultimately up to us, the membership. We welcome your views on ways to enhance this process.

Laura Privalle, Chair, ASPP Membership Committee

ASPP Membership Directory Now On-line

The new membership benefit that was announced earlier this year, the searchable on-line version of the ASPP Membership Directory, is now accessible through ASPP's web page http://aspp.org. The Directory and instructions for use can be found under the "membership" icon on ASPP's main home page. The data is updated frequently and the "last update" is clearly indicated. Please be sure to inform us of any changes in the information under your listing so that we can update it in a timely manner.

No Membership Dues Increase for 1998

The 1998 ASPP Budget was unanimously approved at the Executive Committee meeting held in Vancouver, Canada, on August 1, 1997. This budget contains no membership dues increases in 1998 for any category of ASPP membership.

Unexpected Change in Staff

ASPP staff and members were saddened to learn that Publications Director Susan Wantland was diagnosed in September with a terminal, inoperable brain tumor. Susan had started with ASPP in May of this year. ASPP Executive Director Ken Beam said staff and members share in the grief over this tragic development affecting a valued friend and employee. The search for a new publications director has already begun.

Erratum

In the July/August 1997 issue of ASPP News, there was a photograph depicting James H.M. Henderson along with other colleagues posing with an antique car. In the caption Dr. Henderson's age was incorrectly stated as 66 years old and his car as a classic 1931 Model T Ford. Dr. Henderson is 80 years old, and his car is a classic 1931 Model A Ford. The editor regrets the error.
Mendel Mazelis

Professor Mendel Mazelis was born in 1922 in Chicago, Illinois. Soon thereafter his parents moved to Los Angeles where he received his precollege education. In 1943 he was awarded a B.S. degree in forestry from the University of California, Berkeley. After graduation he joined the U.S. Navy as a midshipman and was discharged in 1946 as a Lieutenant (j.g.) in the United States Naval Reserve. During World War II he served as an officer on a landing craft in the Pacific and was involved in the battles of Leyte, Saipan, and Okinawa.

He returned to academic work after the war as a graduate student in plant physiology. In 1953 he joined the U.C. Berkeley laboratory of Professor Paul K. Stumpf as a research assistant and was assigned the difficult problem of studying the incorporation of radioactive inorganic phosphate into phospholipids by a particulate system prepared from germinating peanut cotyledons. Although he was unable to identify the radioactively labeled phospholipids, he carefully characterized the system in terms of the cofactor requirements, etc. He received his Ph.D. in 1954 in plant physiology and published his research "Incorporation of P32 into Peanut Mitochondrial Phospholipids" [Plant Physiol. (1955) 30: 237-243]. He spent an additional postdoctoral year in Berkeley extending his earlier observations and demonstrating the presence of an active adenylate kinase in spinach chloroplast preparations. As his research mentor, Professor Stumpf was struck by Mazelis's quick mind, his knack of developing procedures pertinent to work, his great sense of humor and fairness, and his ability to ask penetrating questions at seminars.

In 1955 Dr. Mazelis accepted a postdoctoral position in the laboratory of Professor Birgitt Vennesland at the University of Chicago. In 1957 he joined the Western Regional Research Laboratory, USDA, as an associate chemist. In 1961 he accepted the position of assistant biochemist in the Department of Food Science and Technology at the University of California, Davis (UCD). In 1962 he was appointed Lecturer in the department, and in the following year he was given the academic title of Assistant Professor. By 1973 he was promoted to Full Professor of Food Science and Biochemist in the UCD Experiment Station. He retired in 1991 as Professor Emeritus of Food Science.

Throughout these years of academic service, his research focused on the enzymology of amino acid metabolism in higher plants, especially those responsible for characteristic odors and flavors in onions, garlic, turnip, cabbage, and broccoli. In addition, he was interested in the essential amino acids required nutritionally by humans and those required by higher plants for their survival under stress conditions. He is most noted for his work on the cysteine sulfoxide lyases that are found in a wide variety of higher plants (onions, garlic, leek, turnip, cabbage, and broccoli) but are very different taxonomically. Initially, the lyases were very difficult to purify because of their instability, but armed with patience, perseverance, and high-quality graduate students, Mazelis was successful in isolating these enzymes from most of the plants mentioned above, and in characterizing them both as proteins and as enzymes. Since similar cysteine sulfoxide lyases were found in quite different taxonomically diverse plants, and since there was little cross-reactivity among them by rabbit antibodies against the onion and garlic enzymes, he suggested that the enzymes were probably the result of concurrent evolutionary development rather than having arisen from a primitive precursor. His careful research led to him being recognized as a leading scientist in this field.

Professor Mazelis used the Socratic method in teaching graduate students, primarily playing the "devil's advocate," thereby forcing the students to defend their answers or points of view. In this way he inspired them to gain self-confidence in their answers based on their understanding of the subject matter. He was also a successful advisor of undergraduate students, especially to food biochemistry majors and biochemistry majors.

In all of his research he was well supported by major grants from the National Science Foundation. He was a life-long member of a variety of scientific organizations, such as the American Society of Biochemistry and Molecular Biology and the American Society of Plant Physiologists. In particular, he served for many years as an active member of the editorial board of Plant Physiology and was a reviewer for many other scientific journals relevant to his field of interest. In addition to his research and teaching activities in the department, he collaborated on research with Sir Leslie Fowden, first at University College, London, and then later at the Royal Experiment Station at Rothamsted, England.

With his arrival on the UCD scene in 1961, he rapidly became not only a campus institution but also a Davis institution. Because of his wit, sense of fairness, and broad interests in city, regional and national affairs, he was able to express his many points of view articulately without offending even those who disagreed with his ideas. Indeed, at the annual meetings of the American Society of Plant Physiologists, he rapidly became widely known by senior and junior scientists as well as undergraduate and graduate students as having a wit of the highest order. He had a great love for football, and at the start of each season, he wrestled with the tragic drama that emanated from Memorial Stadium in Berkeley. Because of his phenomenal knowledge of this sport, his Sunday morning agonies must have tested his most loyal wife, Noreen.

With his death on June 30, 1997, not only his immediate family but also his many academic and scientific colleagues all over the world will truly miss the unique personality of Mendel Mazelis.

Paul K. Stumpf
Davis, California
With Plant Biology '97, the ASPP annual meeting became firmly established as a truly international gathering place for plant biologists. ASPP took advantage of its joint meeting with CSPP and the location chosen for Plant Biology '97, Vancouver, to include other societies of plant physiologists in the Pacific Rim region. ASPP, in collaboration with the CSPP, invited the Australian Society of Plant Physiologists and the Japanese Society of Plant Physiologists to organize significant portions of our meeting. Joe Wiskich, Paul Kriedemann, Moritoshi Iino, Hide Imasaki, Jain Taylor, and Rob Guy are among the many from these societies who actively worked to promote Plant Biology '97 among their colleagues as well as participated in the planning of the meeting. AuSPP and JSPP each organized a minisymposium. All major and minisymposia tapped the wealth of research from our colleagues in the Pacific Rim, bringing many attendees to remark about the excellent quality of the meeting.

Vancouver, an international city by calling, was a welcomed location for the scientists from the Pacific Rim countries. Approximately 1,950 attended Plant Biology '97, a record attendance for an ASPP annual meeting. And it seemed nearly as if every attendee linked their the science outing to an outing of leisure and adventure. Forty-eight participated in the premeeting cruise to Alaska, which also resulted in a $7,500 donation to the ASPP Education Foundation. Countless others headed for cruises, sight-seeing, hiking, and other vacation venues in the days following Plant Biology '97. Enriched in mind and spirit, our colleagues should be ready to bring an abundance of exciting data and new ideas to Plant Biology '98 in Madison, Wisconsin, next June.

Confirming the value of ASPP's international efforts, ASPP has formed a closer relationship with the JSPP and our Japanese colleagues were most gracious in expressing their appreciation for our inclusive efforts, and they look forward to joining us again.

Meeting attendees found no inconvenience scurrying in the sunny northwest summer days between the Hyatt, where the majority of our presentations were held, and the Hotel Vancouver, which offered a palatial labyrinth of chandeliers corridors and rooms in which we viewed and discussed the posters. The hotels also accommodated the well-attended breakfasts, lunches, and dinners planned to serve special sub-populations of our attendees. Good food certainly facilitated the successful renewal of research and personal connections, as well as eased the chores of the "business" that must be conducted. We look forward with great aesthetic interest to the site of our meeting in June '98 at the Monona Terrace Convention Center, recently built according to its original design by Frank Lloyd Wright.

As in recent years, the workshops and gatherings of various interest groups at Plant Biology '97 increasingly complemented our scientific agenda. An overflowing crowd of graduate students and post-docs arrived for a premeeting workshop on careers held on Saturday morning. Thanks to organizers Pam Green, Judy Verbeke, Dale Blevins, and workshop convener Elizabeth Vierling, the workshop was a resounding success. The demand for such a workshop was much greater than initially anticipated. ASPP's movement into support and service to students and post-docs has grown significantly over the past two years. Postdoctoral students now pay reduced dues for membership in ASPP, and student dues have held steady for the past few years. Service to our bright and budding new plant biologists is a strong commitment of ASPP, and the Saturday workshop more acutely highlighted their needs and charted our eagerness to respond.

Martha Krebs, Director of the Office of Energy Research for the DOE, drew a standing-room-only crowd as she presented the vision and priorities for future plant biology research to be funded by the DOE. The Committee on Public Affairs is to be complemented for bringing a national leader in the scientific research community to our meeting. Information was gained by attendees, and I am sure, impressions of intriguing research in plant physiology were carried back to DC.

Once again the informal breakfast gathering of folks from small colleges and primarily undergraduate institutions (PUI's) drew a very large turn out. Discussions and exchange of ideas at the roundtables kept the room humming well past the scheduled time period for this event. This was the second year for the event, conceived and organized each year by Mark Brod! Attendance at the first gathering was strong, but attendance escalated this year, attesting to the effectiveness of designating a time and place to establish networks among plant biologists faced with the exciting and demanding challenges of presenting plant biology to future plant biologists as well as future physicians and CEOs.

Both the Education Committee and the Committee on Public Affairs organized workshops for Monday evening. Each had expert speakers who gave insight not often gained through our daily activities as researchers and faculty, but which enrich our scientific lives in important ways. Furthermore, as the space and content of the Education booth has continued to blossom, in conjunction with its strategic location within the poster area, most of us "doing" the posters didn't miss an opportunity to contact the creative folks at this booth and sample their ideas.

Both the Minorities Affairs Committee and the Committee on the Status of Women in Plant Physiology organized luncheons with speakers who evoked a reverence for the personal rewards of engaging students in science (Maria Elena Zavala) and cautioned us against taking the status quo in science without challenge (Sue Rosser).

Although many groups benefited from the formal and informal dinners with their special groups, the grand feast of food from three continents kept the palate dazzled at our Dinner Dance (a complete sell-out!). I sampled everything except the U.S. fare (which seemed "foreign" to me), and can attest to the benefit gained from battling the circuitous lines to reach the uncommonly good fare which was intriguing and plentiful.

Not the least of the "thrills" this year was the 10K run, rumored to be only 7K. The phantom participant who ran under the name of Jim Siedow did more than justice to Jim's gazelle-like fleet-footed technique, so I am told by various observers who have watched the mighty Siedow in awe for many years.

And we heartily thank our Canadian hosts for developing the creative design on our official meeting T-shirt, now a true ASPP tradition. Speaking of tradition, our meetings in recent years have been anything but "traditional." With our Mexican colleagues eagerly participating in Plant Biology '96, and our Pacific Rim colleagues in '97, we look forward to Plant Biology '98, which is designed to overlap with the end of the Arabidopsis meeting in June, 1998. ASPP has already planned two major symposia to entice participation by both groups: Joanne Chory will organize and present in the ASPP opening symposium on Saturday afternoon, and Daphne Preuss and Judy Verbeke will organize the symposium for Sunday morning. Attendees of both meetings will mingle at the opening mixer on Saturday evening hosted by ASPP.

To end, we start with the beginning: Upon arrival at any conference, each attendee's
Six Are Honored by ASPP at Plant Biology '97

Following are the citations for the awards that were presented August 3rd at the annual awards ceremony at Plant Biology '97, the annual meeting held in Vancouver, British Columbia.

Charles Reid Barnes Life Membership:
James H.M. Henderson

The Barnes award is the oldest ASPP award. It was established in 1925 in honor of Dr. Charles Reid Barnes, the first professor of plant physiology at the University of Chicago. It is an annual award of life membership in the Society given to recognize the awardee for meritorious work in plant physiology.

Dr. James H.M. Henderson received the Ph.D. degree from the University of Wisconsin at Madison in 1943. After spending two years with the National Defense Research Committee, he served as a chemistry assistant in the Toxicity Laboratory at the University of Chicago during World War II. In 1945 he was appointed as a Research Associate in the Carver Research Foundation at Tuskegee University. After serving as a Research Fellow at California Institute of Technology from 1948 through 1950, Dr. Henderson returned to Tuskegee University. He then rose through the ranks in the biology department and served as professor and chair from 1957 through 1988 and director of the Carver Research Foundation from 1968 through 1975. Dr. Henderson has served as chair of the division of natural science at Tuskegee since 1975.

True to the spirit of George Washington Carver, Dr. Henderson's research has centered around culture of plants in vitro. In a research career that has spanned more than 50 years, Dr. Henderson has published numerous papers in refereed journals and has received support for his research from NASA and the National Science Foundation. Some of these involve auxin metabolism in normal and crown gall responses, the effect of 2,4-D on geotropic and phototropic responses, the effect of gibberellin on sunflower tissue culture, and vitrified tissue in sweet potato cultures.

Through the years, Dr. Henderson has served as a consultant with the National Research Council, as a panelist for the NSF, as a member of the board of directors of the society of Sigma Xi, and as a member of the board of directors of Oak Ridge Associate Universities. Dr. Henderson has been a strong supporter of the American Society of Plant Physiologists, and he has had enormous impact on the Southern Section of ASPP. He has served as secretary, vice-chairman, chairman, and member of the executive committee, as well as historian, of this Section. In 1984 Dr. Henderson was nominated to the White House for appointment to the National Science Board and received the Distinguished Service Award from the Southern Section of ASPP. In 1991 he organized the "Plant Science Workshop on Environmental Stress" on the campus of Tuskegee University with funds from NSF and USDA.

While the achievements listed above are highly significant, Dr. Henderson's most important contribution surely has been and remains his commitment to education. Over the years he has taught plant physiology to hundreds of students and has trained outstanding plant physiologists. Clearly, Dr. Henderson is an inspiration to graduate and undergraduate students as well as to his colleagues. He has served since 1973 as program director of the Minority Biomedical Support Program and since 1978 as project director of the REACH-OUT Program. Dr. Henderson has been influential in training high school students and undergraduate and graduate students as well as high school teachers. He has had a profound influence on graduate students in the Southern Section of ASPP through his support and encouragement of their research efforts.

In acknowledgment of his research in plant tissue culture, his mentorship of hundreds of students over the years, and his service to our society, the American Society of Plant Physiologists pays tribute to Dr. James H.M. Henderson with the 1997 Charles Reid Barnes Life Membership Award.

Charles Albert Shull Award:
Julian I. Schroeder

The Charles Albert Shull Award was initiated in 1971 by the Society to honor Dr. Charles A. Shull, who was largely responsible for the founding and early growth of the Society. The award is made biennially by the Society for outstanding investigations in the field of plant physiology by a scientist residing in North America and who is less than 40 years old or within 10 years of having earned the doctoral degree.

Julian Schroeder is awarded the 1997 Charles Albert Shull Award of the American Society of Plant Physiologists in recognition of his original and innovative research on plant ion channels, guard cell signal transduction, and mineral uptake, as well as the leadership he has displayed in...
applying a wide array of biophysical and molecular approaches to problems in whole plant physiology. Even as a graduate student, Julian was instrumental in introducing plant biologists to patch clamping, and his subsequent work employing this technique has led him to seminal discoveries in many areas. Julian was also the first to characterize plant ion channels in detail, and his application of patch clamping to studies of K⁺ uptake by roots has changed the way we think about mineral nutrition.

His early work allowed Julian to distinguish inwardly and outwardly rectifying K⁺ channels in plants for the first time, and to show that they provide the major pathways for K⁺ movement during stomatal opening and closing. His work highlighted major differences between plant and animal K⁺ channels and showed how channel activity can be regulated by voltage gradients. More recently, Julian's laboratory succeeded in cloning the first high-affinity K⁺ channel from plants.

Julian's discovery of ABA-regulated Ca²⁺ channels provided the first important clue to the mechanism of ABA action in guard cells. He also showed that an ABA-induced rise in cytoplasmic calcium leads to activation of slow anion channels, that these slow anion channels are the main controllers of stomatal closing, and that the phosphorylation state of these anion channels influences the stomatal response.

Julian's work on Ca²⁺ channels also has important general implications. For example, he was the first to show that the ubiquitous slow vacuolar channel had high Ca²⁺ permeability, helping to establish that vacuolar stores play a role in Ca²⁺ homeostasis. He was also the first to provide direct evidence for voltage-dependent Ca²⁺ channels in the plasma membrane of higher plants.

In summary, Julian Schroeder is a highly original thinker whose ideas and discoveries have influenced several fields of plant physiology. His career exemplifies the attitudes and achievements expected of a Shull Award winner.

Martin Gibbs Medal:
William J. Lucas

This award, initiated in 1993, honors Martin Gibbs for his outstanding service to the Society as editor-in-chief of Plant Physiology from 1963 to 1993. This award is given biennially to an individual who has pioneered advances that have served to establish new directions of investigation in the plant sciences.

The primary criterion for award of the Gibbs medal is that the recipient should have “pioneered advances that have served to establish new directions of investigation in the plant sciences.” Bill Lucas has contributed extensively and significantly in the general area of transport in plants, both long distance and at the level of the membrane, and from algae to higher plants. In particular, Bill has contributed an impressive series of key observations, methodologies, and insights that have promoted, reinvigorated, and redirected the study of plasmodesmal biology. He has advanced the theory that plasmodesmata serve regulatory roles, mediating the cell-to-cell movement not only of small molecules but also of macromolecules such as proteins, RNA, and DNA, and of macromolecular complexes. The global significance of this concept is that plants function as supracellular, rather than as multicellular, organisms. Fundamental concepts that have governed traditional thinking in plant physiology, developmental biology, and virology are being reassessed as a result.

Like Martin Gibbs himself, Bill Lucas has also made significant contributions to the well-being of ASPP. He has served on ASPP committees, taught in the ASPP plant biochemistry course, and organized symposia and workshops under the auspices of ASPP. Over just the last five years, Bill has organized 12 symposia on topics including cell-to-cell communication, ion transport, and plant nutrition. As one participant in his “Plasmodesmata Workshops” noted, “These are truly amazing meetings, with talks and posters that range from pure ultrastructural analyses to studies employing the latest of molecular tools. These meetings are the best examples of real interdisciplinary approaches that I have ever experienced....”

Thus, in recognition of both his pioneering research and his inspirational leadership in the field of plant (supra)cell biology, the Society is pleased to award the Gibbs medal to Professor William J. Lucas.

Dennis Robert Hoagland Award:
Brian A. Larkins

This monetary award, established by the Society in 1985 with funds provided by the Monsanto Agricultural Products Company, honors Dr. Dennis R. Hoagland, recipient of the first Hales award, for his outstanding contributions and leadership in plant mineral nutrition. The award, to be made not more frequently than triennially, is for outstanding plant physiological investigations in support of agriculture.

Brian A. Larkins is awarded the Dennis Robert Hoagland Award for his many contributions to the development of plant agricultural biotechnology. Dr. Larkins was a pioneer in the isolation and characterization of genes important in regulating protein quality in corn and other grain species. His long-standing interest in improving the nutritional quality of cereal grains led to the continued on page 8
semital finding that the content of elongation factor-1α, a protein synthesis factor, is an index for the lysine content of cereal seeds. This discovery allowed Dr. Larkins and his colleagues to develop a convenient ELISA method for rapid, inexpensive, and nondestructive screening for lysine content in single-seed progeny of genetically segregating populations. This method will benefit large-scale breeding programs for which lysine screening was previously impractical.

A second contribution of major impact was Dr. Larkins's characterization of maize opaque-2 modifier genes responsible for the normal phenotype of Quality Protein Maize (QPM) kernels. This better understanding of the molecular basis for QPM should provide tremendous benefit to QPM development programs worldwide, especially in less developed countries. Throughout his career, Dr. Larkins has made outstanding contributions to understanding seed biology. His work has encompassed events from gene expression to packaging of storage proteins into protein bodies to distribution of protein bodies within the cytoskeletal framework of the endosperm. His research into protein quality of cereals likely will become the basis for improved nutrition throughout the world.

Dr. Larkins has promoted plant biology research through his leadership and service as an editor-in-chief of THE PLANT CELL, associate editor of Plant Physiology, and editorial board member of Plant Molecular Biology. He has also served as head of the department of plant sciences at the University of Arizona, and as an organizer, chair, or speaker at numerous national and international scientific conferences. He has been a champion of applying tools of molecular biology to solving problems confronting breeders and industry. His contributions and accomplishments have earned him many awards and honors, including ASPP’s Charles Albert Shull Award (1983), Arizona Innovator of the Year (1994), the Porterfield Chair in Plant Sciences at the University of Arizona (1995), and, most recently, election to the National Academy of Sciences (1996). The American Society of Plant Physiologists is pleased to recognize Brian A. Larkins as a worthy recipient of the Dennis Robert Hoagland Award.

Estela Sanchez de Jimenez

Estela Sanchez de Jimenez is one of Mexico’s leading plant biochemists. She has given steadfast and important leadership to the plant biology community of Mexico for the past 20 years. She was trained as a biochemist at the University of Wisconsin in Madison, where she obtained her Ph.D. in 1962 and later did postdoctoral work. After returning to Mexico, she pursued research related to aging and cell differentiation in mammalian cells for five years. She then decided to switch to work on plants. She began research with plant cell cultures and, a few years later, became the founding president of the Mexican Association for Plant Tissue Culture. Most recently, she has focused her work on two aspects of plant biochemistry: the role of phosphorylation of ribosomal proteins in the control of protein synthesis during seed germination, and the possible function of Rubisco activase as a chaperone for Rubisco in enhancing the rate of CO₂ fixation. She publishes in journals ranging from Biochemistry and Plant Physiology to Crop Science and Seed Science Research. Dr. Sanchez was head of the biochemistry department at the Universidad Nacional Autonoma de Mexico from 1968 to 1980 and again from 1984 to 1986; from 1986 to 1993 she was head of the Biochemistry and Pharmaceutical Division. She has been the thesis advisor for 9 Ph.D. students and 22 M.S. students. She is a member of the National Academy of Science of Mexico, and is a level D Full Professor and a level 3 Investigator of the National System of Investigators of Mexico, each the highest level that can be obtained. Her work is widely respected both in and outside of Mexico. Because of the leadership of Estela Sanchez, plant biology has attained a level of excellence in Mexico unrivaled elsewhere in Latin America.

Vladimir A. Shuvalov

Vladimir Shuvalov’s research in the field of photosynthesis has been pioneering. He has made fundamental contributions to the understanding of the primary photosynthetic events that take place in the reaction center complexes of photosynthetic organisms. He has probed these ultrafast processes using a wide range of advanced spectroscopic techniques including picosecond and femtosecond transient absorption measurements. His innovative work was instrumental in identifying bacteriochlorophyll as an essential intermediate in the electron transport chain in purple bacterial reaction centers. He was the first to propose that bacteriochlorophyll functions as the initial electron acceptor in these complexes. In addition to this central core of his work on purple photosynthetic bacteria, he has made major contributions to the current understanding of photochemistry in reaction center complexes from higher plants, as well as green photosynthetic bacteria. Dr. Shuvalov also plays an important role as a mentor for students and other individuals working in his group. He instills in his students a real love and appreciation of the complexities of science, especially as it applies to biological systems. His students have a clear grasp of the interesting range of questions and the complexities that biological systems offer to physical techniques. His laboratory is a model for interdisciplinary training in the biological and physical sciences. Dr. Shuvalov is currently Director of the Institute of Soil Sciences and Photosynthesis and Head of the Department of Photobiophysics at the A.N. Belozersky Institute, Moscow State University. He is a Corresponding Member of the Russian Academy of Sciences, and in 1991 he was awarded the Russian State Prize in Science.

Corresponding Membership Awards:

This honor, initially given in 1932, provides life membership and Society publications to distinguished plant physiologists from outside the United States. The honor is conferred by election on the annual ballot.

Estela Sanchez de Jimenez

Vladimir A. Shuvalov
Tenacity and Serendipity

by Joanne Chory
Associate Investigator, Howard Hughes Medical Institute
Associate Professor, The Salk Institute for Biological Studies

Every now and then, several fields of study converge and an important discovery is made. In my case, I was lucky to be involved in the intersection of biochemical, physiological, and molecular genetic studies which led to a general reawakening by plant physiologists of the important role played by a class of plant steroids, the brassinosteroids (BRs), in plant growth and development.

During the late 1970s, BRs were purified through heroic efforts made by a team of USDA researchers who also identified the structure of the most active BR, brassinolide. During the 1980s and 1990s, a number of elegant physiological and biochemical studies with brassinolide were performed and a pathway for its synthesis from the plant sterol, campesterol, was proposed. Still, BRs had not been widely accepted as important phytohormones by most plant physiologists. I believe the reason for this is because the effects of BRs on cell elongation and proliferation qualitatively resemble those of auxins, and exogenously applied BRs result in phenotypes similar to the effects of auxins. It was not surprising, therefore, when we ran the new sequence against known sequences in Genbank. DET2 was predicted to encode a protein that shares significant sequence identity with mammalian steroid 5a-reductases. Mammalian steroid 5a-reductases catalyze a NADPH-dependent conversion of testosterone to dihydrotestosterone, a key step in steroid metabolism that is essential for the embryonic development of male external genitalia and the prostate.

Simultaneously, a gene called CPD was also cloned from a T-DNA tagged mutant identified by Csaba Koncz and his co-workers in Cologne, who were working together with Thomas Altmann’s group in Berlin. The cloning of CPD also suggested a role for CPD in steroid synthesis or metabolism. CPD encodes a protein that exhibits some homology to mammalian cytochrome P450 proteins including steroid hydroxylases. Therefore, CPD might be responsible for a specific hydroxyltion step in a steroid biosynthetic pathway. The proof that DET2 and CPD encoded enzymes involved in the synthesis of BRs came from feeding BR biosynthetic interme-
The pleiotropic effects of det2 and cpd mutations on Arabidopsis development suggest the involvement of BRs in several developmental processes throughout the life cycle of Arabidopsis. These include the expression of light-regulated genes, the promotion of cell elongation, normal leaf and chloroplast senescence, and floral induction. The detailed phenotypic analyses of these mutants therefore suggested a precise role for BRs in plant development. The unique and easily scorable phenotypes of det2 and cpd mutants also immediately suggested a genetic screen for mutants in the brassinolide response pathway. A number of labs, including Steve Clouse's at North Carolina State, Thomas Altmann's, and my own identified brassinolide-insensitive mutants. The mutants were called bril, cbb2, and bin1, respectively, by each lab and 20 mutants with such a phenotype were identified. Surprisingly, all 20 mutations defined a single gene. Earlier this year, through more hard work and some luck, Jianning Li, a postdoctoral fellow in my lab, cloned this gene and showed that it encodes a putative leucine-rich-repeat receptor kinase that is involved in BR signaling. This discovery is the end of my short story, which I hope you will agree shows how converging information from several fields of study can signal new beginnings.

Suggested Reading:


Bernardo Jiménez Barrera, Chief Operating Officer of the Agrobiotechnology Division of Empresas La Moderna (ELM), and Fredric “Fritz” Corrigan, President of the Agriculture Group of Cargill, Inc., recently joined the Board of Directors of the ASPP Education Foundation.

ELM combined its biotechnology R&D and its fresh produce subsidiary with DNA Plant Technology [DNAP] in January 1996. ELM, with its related companies Aggrow Seed Company, Petosed, Royal Siuis, Agroindustrias Moderna, and others, holds a leading worldwide market in vegetable and agronomic seeds. With the world’s largest vegetable germplasm bank, its R&D facilities operate in more than 25 countries.

Prior to serving as the CEO at ELM, Mr. Jiménez was the Chief Financial Officer at ELM. He focused his efforts in operations and finance for 19 years with Grupo Industrial Alfa, where he held various positions. In 1993 he left Alfa to manage the Industrial Banking Division at the Vector Group and then served as Vice President for New Business Development for Pulsar.

Mr. Jiménez holds a degree in Chemical Engineering from the Instituto Tecnologico y Estudios Superiores de Monterrey (ITESM) and an MBA from Cornell University.

The Cargill Agriculture Group includes its worldwide fertilizer, seed, and molasses businesses. Mr. Corrigan serves on the Cargill, Inc. Operating Committee and is Chairman of the Board of Directors of Cargill Fertilizer, Inc. He is Director and member of the Executive Committee of Saskferco Products, Inc., in which Cargill has 50% interest.

Joining Cargill’s training program in 1986, Mr. Corrigan held merchandising positions in the soybean processing division and the corn milling division. He worked as General Manager with corn processing, then Head of the coal department. He became Vice President of flour milling and was elected President of Cargill’s new fertilizer division in 1982. In 1992 he was named President of the worldwide fertilizer division.

Mr. Corrigan is a member of the Board of Directors, the Executive Committee, and the Trade Policy Committee of The Fertilizer Institute, a Director of the Potash & Phosphate Institute, and served as Chairman of the Florida Phosphate Council.

He received a degree in Economics from Dartmouth College and attended the Amos Tuck School of Business executive program.

Both Mr. Jiménez and Mr. Corrigan bring a wealth of experience to the Foundation Board. At the Board meeting in September, Board Chair Richard Laster and ASPP President Don Ort heartily welcomed their valuable participation on the Foundation Board.

**Two New Members Join Education Foundation Board**

B. Jiménez and F. Corrigan

**Appeal to help CSU library**

Dear Members,

As some of you may have heard, the campus of Colorado State University was damaged in a flash flood on 28 July. CSU’s library was especially hard hit. The library is nearing the end of a major expansion, and a large number of its holdings was housed in the basement in anticipation of the completion of the expansion later this year. The basement suffered extensive damage, and the library lost ALL of its bound journals, some 18,000 subscriptions (450,000 items), plus a large number of books. An effort is underway to rebuild the collection, but it will be years before this task is completed. The purpose of this message is to ask for your help. If any of you is nearing retirement and is interested in donating back issues of journals or scholarly books to a worthy cause, please consider making the donation to the CSU library. If you know of colleagues who might be in a similar situation, please bring this message to their attention. If you have items to donate, please send queries to Suzanne Johnson at sjohnson@manta.colostate.edu.

The phone system still has not been restored to full service. Thus, the best way to communicate is via electronic mail. Someone will respond to your message, but probably not immediately. The library is receiving 200-300 messages a day, and staff are doing their best to reply in a timely manner. Nonetheless, they remain chronically behind in this effort. Please be as patient as possible if your query is not answered quickly.

Many thanks for your help.
Senate Agriculture Committee Approves New Research Program with $780 Million for Competitive Grants

The Senate Agriculture Committee voted on July 30 to approve reauthorization of Department of Agriculture Research, Extension and Education legislation (Senate Bill 1150, also referred to as the Research Title of the Farm Bill). Major provisions of the bill include:

**Initiative for Future Agriculture and Food Systems**

Creation of a new competitive grants program (in addition to the NRI and Fund for Rural America) which would be an Initiative for Future Agriculture and Food Systems. The Committee authorized use of $780 million over the next five years for this competitive research program.

Priority mission areas to be addressed by the program in the first year are: agricultural biotechnology, food genome, food safety, food technology and human nutrition; new and alternative uses and production of agricultural commodities and products; and natural resource management including precision agriculture.

The food genome strategy would be for development and dissemination of information regarding the genetics of agriculturally important plants, animals, and microbes. Eligible grantees for this new competitive grants program would include federal research agencies, national laboratories, colleges or universities, and private research organizations with established research capacity.

Scientific peer review or merit review of proposals would be required. Priority would be given to grants that are multi-state, multi-institutional, or multi-disciplinary and to grants that integrate agricultural research, extension, and education. The five-year, $780 million competitive grants program would start out at $100 million in FY 98 and would be $170 million for each of FY 1999–2002.

Senate Agriculture Committee Chair Richard Lugar (R-IN) and the committee have made repeated attempts to find new sources of funds for USDA-supported competitive research. His proposal in the last Congress for the Agricultural Competitiveness Initiative led to the creation of the Fund for Rural America supported with funds from the Commodity Credit Corporation. Lugar’s proposal for the Initiative for Future Agriculture and Food Systems would make use of funds from administrative savings in the Food Stamp Program, from information technology savings in the Commodity Credit Corporation, and from funds made available from more efficient operation of the Conservation Reserve Program.

All of these three accounts are nontraditional sources for research funding. Most federal research programs are funded, instead, out of discretionary accounts. Federal budget balancing efforts have severely limited any opportunity to establish or expand competitive grants programs with discretionary funds. In response to this, Lugar has been very resourceful in making use of mandatory funds to create competitive grants programs for agricultural research.

**Higher Administrative Cap for NRI**

The bill would set the indirect administrative cost cap at 25% instead of the current 14% in the NRI, and would newly set the 25% cap for the Fund for Rural America and new Initiative for Future Agriculture and Food Systems.

**National Food Genome Strategy**

The legislation would authorize the Secretary of Agriculture to establish a National Food Genome Strategy on agriculturally important plants, animals, and microbes. Research would be conducted through grants awarded on a competitive basis. The Secretary would be authorized to consult with the National Academy of Sciences regarding the National Food Genome Strategy. The Secretary could allow for indirect costs in the same manner such costs are allowed under contracts, grants, and cooperative agreements by the National Science Foundation.

**Precision Agriculture**

The bill authorizes a new competitive grant program for research education and information dissemination projects for the development and promotion of precision agriculture. (ASPP had opposed an earlier proposal that is not now in this bill that would have placed a requirement on the NRI that all NRI research be reviewed to determine its contribution to precision agriculture.)

**New USDA Office of Energy Policy**

The bill creates a new Office of Energy Policy and New Uses within the Office of the Secretary of Agriculture. This is expected to elevate the level of attention given by the Department to energy-related research.

**Biobased Products**

The bill directs the Secretary to coordinate research, economic and market information and other activities to develop and promote biobased products.

**Fund for Rural America Program Reauthorized**

The Fund for Rural America, which was originally authorized to be just a three-year program that would skip FY 98 will be extended through October 1, 2001, and include FY 98 At least 33% of the Fund would go for research; 50% for rural development; and 17% would be allocated among either the research or rural development accounts at the discretion of the Secretary.

**Education Grants and Fellowships**

The bill authorizes a grants and fellowships program for food and agricultural sciences education with priority given to teaching enhancement projects that demonstrate enhanced cooperation among all types of institutions and priority to teaching enhancement projects that focus on innovative, multi-disciplinary material and curricula.

ASPP and others sought increased grant research and education support in this bill in testifying before the Agriculture Committee, in submitting responses to questions and in further working with the Committee. A House staff member observed that the funding mechanism for the proposed new $780 million Initiative for Future Agriculture and Food Systems competitive grants program may face significant opposition from segments in the House.

continued on page 12
On August 12, ASPP sent a letter in support of the new Initiative for Future Agriculture and Food Systems to the Chairman and Ranking Democrat of the House Agriculture Subcommittee on Forestry, Resource Conservation and Research. ASPP Public Affairs Chair Lou Sherman explained the benefits offered by supporting plant research authorized in the Initiative for Future Agriculture and Food Systems.

NRI and ARS Up More Than 3 Percent in Fiscal Year 1998 Budget

The House/Senate Conference Report, which provides FY 98 funds for the Department of Agriculture including agricultural research, provides $37 million for Plant Systems research within the National Research Initiative, an increase of nearly $1 million over the FY 97 amount of $36,044 million. The Natural Resources and Environment category within NRI is budgeted at $17.5 million, which is up slightly from $17.194 million in FY 97. Overall, the NRI is at $97.2 million for FY 98, which is $3 million (or 3.1%) more than the FY 97 level. The Conference Report provides funding for the existing six categories in the NRI and does not add three new categories as proposed earlier by the House.

All six categories received increases ranging from $3,000 for Markets, Trade and Policy to the nearly $1 million for Plant Systems.

The Agricultural Research Service research and demonstration programs received $744,605,000 for FY 98 in the Conference Report, which is up 3.8% from $716,826,000 in FY 97. FY 98 starts on October 1, 1997.

ANNUAL MEETING FUELS REPORTS ON RESEARCH TO ENGINEER PLANTS AS A RENEWABLE ENERGY SOURCE

In coverage of the quadrennial joint annual meeting of the American Society of Plant Physiologists and Canadian Society of Plant Physiologists with participation of the Japanese Society of Plant Physiologists and the Australian Society of Plant Physiologists, Inc., The Vancouver Sun science reporter Margaret Munroe wrote a story for the August 13 publication titled, "Genetically engineered plants produce plastic". The article explained research done by ASPP member Chris Somerville to engineer plants that will produce biodegradable plastic.

The article said these new plants "could give farmers a much-needed financial boost" and that, "According to some proponents, the new plants could even give fossil fuels a run for their money. Plant oils and extracts could one day be more popular and economical for many industrial applications than the petroleum now feeding the world's petrochemical and fuel sector...." "We accumulate fat when we overeat, these plants accumulate plastic," Somerville explained to the newspaper.

"Somerville engineered the plastic-producing plants by giving them three genes from bacteria, which naturally store excess sugar in plastic molecules. The genes, when inserted properly into the plants' genetic machinery, trigger production of long-chained plastic molecules in tissues throughout the plants.

"Plastic is normally made by linking molecules from petroleum products together in petrochemical factories. The bonds are so strong, the plastic doesn't disintegrate.

"Somerville's plants operate on much the same principle, except they use a natural process to fuse the organic molecules together into plastic molecules," Munroe continued.

The article said that the first plastic-producing plant Somerville's team engineered was a common mustard weed called Arabidopsis. "Monsanto has since licensed his techniques and engineered the plastic-generating genes into canola and soybeans. The 'natural' plastic they produce is biodegradable, in that it's readily broken down by bacteria, which eventually reduce the plastic molecules to carbon dioxide and water," Munroe noted.

"'You can throw it in your backyard and it disappears before your eyes,' says Somerville. A plastic bag will disappear within six weeks and shampoo bottles are 90% gone in six months, he says.

"There are more than 250,000 species of higher plants and we only use less than 100 species,' says Somerville. He is engineering a new breed of canola to generate the highly durable plastic molecules and nylons that might be used in paint or car parts. He's also hunting for enzymes capable of turning old tires into something useful. 'There are mountains of rubber out there,' he says."

David Taylor of the National Research Council of Canada's Plant Biotechnology Institute in Saskatoon participated in the opening symposium on metabolic engineering at the ASPP annual meeting coordinated by Somerville. In reporting on David Taylor's research on canola, The Vancouver Sun article noted that transgenic canola seed oil content has been increased 10 to 50% in the lab. "While there are plenty of critics of genetic engineering, Taylor and Somerville are confident their transgenic plants can be safely used," the article said.

The Christian Science Monitor, San Francisco Examiner, and Energy Today contacted ASPP for more information concerning programs at the annual meeting. Seattle-based freelance writer Jim Kling, who had earlier written a story on phytoremediation for Environmental Science & Technology, attended the annual meeting for two days and spoke with poster exhibitors and staff. The ASPP annual meeting was also mentioned on a 24-hour radio news station in Vancouver.
ENGINEERING PLANTS FOR LIFESAVING VACCINES

A BC World News Tonight with Peter Jennings “Solutions” segment of June 5, 1997, featured the research on engineering bananas for use as vaccines against human diseases such as cholera and hepatitis developed by ASPP Education Foundation Board Member Charles Arntzen. The three-and-one-half-minute televised segment is a very favorable report on the advantages of Arntzen’s research in providing more children more affordable vaccines that are administered more easily with less pain.

Peter Jennings introduced the segment on vaccinations and the banana by pointing out that three million people die each year from common diseases like diphtheria, cholera, and hepatitis because they are not vaccinated. Jennings explained that the problem is that many vaccines are expensive and a number of them have to be refrigerated, “But there are some solutions out there, and here is ABC’s Jack Smith.” The segment filmed at the Boyce Thompson Institute in Ithaca, New York, explained that children now face 15 vaccinations for 10 diseases with another 50 vaccinations for another 30 diseases in the works.

Several painful looking injections of vaccines being administered to crying children were shown. Smith reported that a solution to this problem would be to provide an oral vaccine made possible through Arntzen’s pioneering genetic research with the banana, Smith reported. He pointed out that the banana-based vaccine could also be provided at less cost to children around the world.

Jennings concluded the segment with the comment that the development of oral vaccines could lead to a safer food supply. Researchers in the U.S. and Canada are testing vaccines that can be put in corn and soybeans to feed to animals, Jennings said.

ADVERTISEMENT SUPPORTS PLANT RESEARCH

The ASPP Public Affairs Committee and office recently wrote an advertisement supporting plant research, as well as other agricultural research, for the Coalition on Funding Agricultural Research Missions (CoFARM). CoFARM is a coalition of 20 science societies and ASPP is on the steering committee. The ad, “Harvesting a Healthy Economy”, was published on the back cover of the “CQ Monitor” on June 9, 1997, and July 7, 1997. The Agricultural Research Institute was included as a supporter of this full-page ad.

The “CQ Monitor” offers advertising opportunities to reach Congressional members and their staff, federal agency officials, national media, and staff of other associations.

Plant Research Needed in “Reseeding the Green Revolution”

Science published in its August 22, 1997 issue a Special News Report on world food prospects titled “Reseeding the Green Revolution”. The subtitle for the report said, “High-yielding varieties of wheat, rice, and maize helped double world grain production. A repeat performance is now needed, and that will require a new commitment to agricultural research.” ASPP member Tom Sinclair is quoted in the article explaining that it may be difficult to substantially increase the proportion of the crop that consists of grain. Support for plant research including research, using modern transformation technologies was cited as a key to meeting needed increased gains in crop production.

BRIEFING PAPERS ON ASPP HOME PAGE

Briefing papers that can be used by ASPP members in explaining the importance of plant research have been placed on the ASPP home page on the World Wide Web http://aspp.org. The first paper on the home page is Ilya Raskin’s document on phytoremediation. The second paper, which was compiled by the ASPP Public Affairs office, contains many examples of leading plant research supported by the Department of Agriculture, especially those recognized by the ARS and NRI in annual reports. Hans Bohnert developed a briefing paper on plant stress research for ASPP use at a Congressional exhibition held on April 30, 1997. A briefing paper on basic plant research supported by the Department of Energy written by the ASPP Public Affairs office is slated for placement on the home page.

Announcement of New DOE Grants Solicitation

The Department of Energy Office of Energy Research has announced a new grant solicitation (Notice 97-15) for Partnerships for Academic-Industrial Research (PAIR) in support of energy-relevant fundamental research. A copy of the notice can be found at the following web site: http://www.eere.energy.gov/research/grants/fr97_15.html. A link to this address can be reached via the ASPP home page at http://aspp.org by clicking the Public Affairs icon.

The purpose of this new program is to promote research activities involving academic researchers, their students, and industrial researchers. The solicitation calls for preapplication by November 5, 1997 and a deadline for formal proposals of January 14, 1998. ASPP sent this announcement to ASPP Campus Contacts and placed it on the ASPP home page in July. We appreciate the assistance of ASPP member James Tavares in forwarding this information.
Scenes from . . .


Barry Bruce (left), and Sue Keegstra and her husband, Ken Keegstra, enjoy the festivities at the opening mixer. Ken becomes President of ASPP on October 1, 1997.

President-Elect Brian Larkins enjoys a relaxing moment with THE PLANT CELL Managing Editor Judy Grollman during the annual meeting in Vancouver.
President Don Ort displays his true "blue" colors with treasurer Mark Jacobs at the opening night mixer.

Representing ASPP sections at the annual meeting are (from left) Subash Minocha, Raymond Zielenk, Jerry Cohen, Janet Siovin, Marc Cohn, and Robert Slocum.

Janet Siovin (left), Martha Hill (center), and Ludmila Pachepsky share in the fun at the opening mixer.
More Scenes from Plant Biology '97

ASPP President Don Ort (left), his wife, Sara Ort, and Hans Bohnert help get social activities at the annual meeting off to a start at the popular opening mixer.

James Anderson (left) and Thomas Guilfoyle stop by to visit the ASPP exhibit booth.

Education Committee members (l-r) John Markwell, Dale Blevins, Bob Wise, Carol Reiss, and Dino Mondoli gather to enjoy the view.

Maarten J. Chrispeels (left), Editor-in-Chief of Plant Physiology, and Kozi Azada, Editor-in-Chief of Plant and Cell Physiology, share a conversation at a joint reception for the editorial boards of the ASPP journals.
Photosynthesis and the Environment

Comments by David A. Dalton, Biology Department, Reed College, Portland, OR 97202

Photosynthesis—no subject is more central to plant science, nor more representative of the whole organism/molecular schism that is pervasive in modern biology. Traditionally, plant scientists feel either more at home with sensors, OR with HPLC, protein-folding software, and FTIR spectroscopy. Both approaches have been tremendously successful in advancing our understanding of photosynthesis, but the intellectual exchange between the two subdisciplines has been limited. In view of the increasing concern about the potential future impact of global climate changes, it is crucial that recent advances in our understanding of molecular mechanisms and systems should be interpreted in a context that relates to environmental variables.

This book is a superb and successful attempt to bridge that gap while presenting an impressive series of independent reviews. The 20 chapters are written by distinguished, international experts who are major players in the primary literature on the particular subjects they are writing about. For instance, who better to write about the Halliwel-Asada cycle than Asada himself? The entire collection has been molded into a coherent style by Baker’s skillful editing, and each of the chapters has a roughly parallel organization that provides a helpful consistency, since topics and writing style shift between chapters. Each chapter is a thorough review with an extensive list of current publications. This book will be very useful for advanced students and professionals interested in virtually any aspect of photosynthesis.

The book begins with a thorough consideration of the processing of light energy by thylakoids, including photosystem organization and regulation. This is followed by chapters on photodamage and free radical production that are particularly helpful in elucidating the physiological risks that photosynthetic organisms encounter even in a normal environment. The topics progress to carbon metabolism, gas exchange, and source-sink relations. Consideration is then given to the effects of specific environmental variables including light, mineral nutrition, drought, temperature, ambient CO₂ concentration, ozone, and UV radiation. In each case, the coverage goes beyond a simple descriptive cataloging of effects to an in-depth consideration of the biochemical or physiological mechanisms underlying the responses. Many of the chapters are endowed with illustrative schemes, flow charts, or models that summarize large amounts of information in a single, comprehensive figure. This is the kind of integrative presentation one can expect from authors who really know their subject.

Vancouver Education Workshop

The annual Education Workshop was held Monday evening at Plant Biology ‘97 in Vancouver, B.C., and drew over 100 scientists. Drs. Roger Bruning and John Markwell presented background material about the major paradigm shift in learning theory of the past 25 years. The change from behaviorism to constructivism appears to have made slow inroads into many science classrooms. The inclusion of collaborative and cooperative student activities was emphasized. Also explored was the importance of considering affective as well as cognitive objectives in assessment. An outline of the presentation and a bibliography of pertinent references are available on the Internet [http://www-class.unl.edu/bioc321/aspp/plant_ed.htm].

Also available at this web site are activities carried out at the Workshop. Two activities involved exploring how model exercises on the allelopathic response and quantitation of leaf ascorbic acid might be adapted to a cognitive/constructivist classroom. However, most popular was a thoroughly scientific analysis of the differences between Canadian and U.S. candies. The web site contains the results of a parallel study conducted by two teachers and a student from Nebraska high schools. The major difference between the analytical approaches of the Workshop participants and the Nebraskans seemed to be the reliance of the former group on the ‘taste test’. The Workshop ended with considerable debate among the U.S. and Canadian scientists about which candy was superior in flavor (or was it flavour?), and all agreed that a comparative study of Canadian and U.S. beers should be attempted at the Plant Science ’98 Education Workshop in Madison, Wisconsin.

Vancouver Education Booth

The Education Booth at the Vancouver meetings was once again well attended as numerous ASPP members stopped by to view the displays and demonstrations. Carol Reiss set up a simple laboratory using Chara that demonstrated the principles of osmosis and diffusion. Other displays included the 12 Principles of Plant Biology, a card game by Ginny Berg of Northern Iowa University, and flyers for several educational CDs. Probably the biggest hit was the videotape, "The Secret of Life", which featured plants and plant ecosystems in a fascinating view of life on Earth. Another feature of the Education Booth was the display of books containing material of interest to those of us teaching plant physiology. The titles are given below. It is anticipated that an expanded display will be available for the 1998 meetings in Madison.

Berg, V. 1995. Plant Physiology Laboratory Manual, Univ. of Northern Iowa, 100 pp. (bergv@uni.edu).
Marchut-Conrad, J. and P.L. Conrad (eds.) 1996. General Biology I Laboratory Manual, 6th Ed. SUNY Plattsburgh (funded by NSF-ILI and SUNY-P), 20 pp. (marchuj@splava.cc.plattsburgh.edu or Conradpl@splava.cc.plattsburgh.edu).

continued on page 18
ASPP's 12 PRINCIPLES OF PLANT BIOLOGY

A SPP Headquarters, in conjunction with the Education Foundation and the Education Committee, has developed 12 basic principles of plant biology that the Society feels should be included in any biological curriculum. ASPP intends to present these principles during discussion with federal, state, and local education groups as well as with textbook publishers. The Society will work towards the inclusion of the principles in American education in order to increase the PQ (plant quotient) of students from K through college.

1. Plants, like other organisms, make DNA, enzymes, proteins and other molecules. However, plants are unique in that they have the ability to use energy from sunlight along with other chemical elements for growth, and thus provide the world's supply of food and oxygen.

2. Plants play an essential role in the circulation of nutrients, such as the conversion of atmospheric nitrogen into a biologically useful form.

3. Land plants evolved from ocean-dwelling, algal-like ancestors, and plants have played a role in the evolution of life, including the addition of oxygen and ozone to the atmosphere.

4. Reproduction in flowering plants takes place sexually, resulting in the production of a seed. Reproduction can also occur via asexual propagation.

5. Plants, like animals and many microbes, respire and utilize energy to grow and reproduce.

6. Cell walls provide structural support for the plant and also provide fibers and building materials for humans, insects, birds, and many other organisms.

7. Plants exhibit diversity in size and shape ranging from single cells to gigantic trees.

8. Plants are a source of medicines and other products used by humans.

9. Plants, like animals, are subject to injury and death due to infectious diseases caused by microorganisms. Plants have unique ways to defend themselves against pests and diseases.

10. The uptake and movement of water is essential to the plant for cooling, uptake of mineral elements, structure, and circulation.

11. Plant growth and development is under the control of hormones and can be affected by external signals such as light, gravity, touch, or environmental stresses.

12. Plants live and adapt to a wide variety of environments. Plants provide a wide variety of environments for birds, beneficial insects, and other wildlife in ecosystems.

ASPP Officers and Committees Rotate on October 1

October 1 is the date when new ASPP officers assume their posts and new committee appointees begin their tenures.

Ken Keegstra, director of the MSU-DOE Plant Research Laboratory at Michigan State University, will become president of ASPP. Keegstra has been on the Society's executive committee for the past four years. He served for three years as elected member and one year as president-elect. He will preside during 1997-1998 and serve as immediate past president in 1998-1999.

Don Ort, USDA/ARS and professor at the University of Illinois, will rotate to the position of immediate past-president for 1997-1998.

Brian Larkin, professor at the University of Arizona, will succeed Keegstra as president-elect. Larkin will complete a five-year term as the Editor-in-chief of THE PLANT CELL on June 1, 1998.

Mary Jo Vesper, associate professor and dean at the University of Dayton, was re-elected to a second two-year term as secretary and chair of the program committee.

Terri Lomax, associate professor at Oregon State University, was appointed to a three-year term to the position of treasurer. Lomax previously served on the executive committee for several years as the Western Section representative.

Also taking office on October 1 will be Joe Chappell, associate professor at the University of Kentucky, who will serve on the executive committee as an elected member for a three-year term. Alison Roberts will also begin a three-year term on the Executive Committee as the representative from the Northern Section.

Committee changes will be announced in the November/December issue of ASPP NEWS.
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 Sylvia J. Braxton, ASPP NEWS, 15501 Monona Drive, Rockville, MD 20855-2768 USA. **Faxed transmissions are not accepted.**

### Gatherings

**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

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**1997**

**OCTOBER**

October 25-28
Workshop on the Biochemistry of Plant Phytate and Phytases
Copenhagen, Denmark
Contact: Soren K. Rasmussen, Riso National Laboratory, Mil-301, P.O. Box 49, Dk-4000 Roskilde, Denmark; fax 45 46 77 4122, e-mail soren.rasmussen@riscoe.dk.

October 26-31
Symposium on Soil Acidity and the Rhizosphere
American Society of Agronomy Meeting
Anaheim, California
Contact: Nancy Cavallaro, Texas Tech University, Department of Civil Engineering, Mail Stop 41023, Lubbock, TX 79409-5000; telephone 806-742-3481, ext. 226, fax 806-742-3488, e-mail ncavallaro@coe2.coe.ttu.edu or wrccav@ttacsl.ttu.edu.

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**NOVEMBER**

November 19-22
13th Annual Meeting of the American Society for Gravitational and Space Biology (ASGSB)
Washington, DC
For information contact: Patricia Russell, ASGSB, PO Box 12247, Rosslyn, VA 22210; e-mail ASGSB@usra.edu, fax 703-0671-1706.

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**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) 62 13 65 13, fax 33 (0) 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

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.

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**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, Congres 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.

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**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.
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.icsb.riester.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 Rheologie du Bois
de Bordeaux, Domaine de l'Hermitage, B.P. 10,
33610 Cestas Guinert, France; telephone
+33 5 56 57 97 91 64; 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 Technolo­
gies, Cambridge, Science Park, Cambridge, UK.
CB4 4WA; e-mail mmb.atc@dial.pipex.com.

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 +4 1223 333053, 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/PCGS/
IPCSA98.html, or Dr. Yuji Kamiya, Plant
Hormone Function, FRP RIKEN, Hirooawa 2-1,
Wako-shi, Saitama 351-01, Japan;
e-mail ykamiya@postman.riken.go.jp, fax +81-48-
462-4716.
# 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

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I am seeking the following position (check all that apply):

- [ ] Permanent
- [ ] Temporary
- [ ] Postdoctoral
- [ ] Industrial
- [ ] Academic
- [ ] Government
- [ ] USA only
- [ ] Outside USA

US citizen? [ ] Yes [ ] No Date available: ______________

Fields of interest, specialities, and publications titles:

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Thesis, dissertation topics, professor:

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Professional societies and honors:

Degree/year Major Minor College/University and its location

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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 sbbraxton@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.)
- Fellowships, Traineeships, Graduate Assistantships, etc.: Announcements of programs and fellowships or traineeships 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.
management, pathology, entomology, IPM, and related fields. There is an expectation of giving guest lectures on horticultural weed science issues in several horticultural classes. Success in obtaining extramural funds for extension and research program is expected. Qualifications: Ph.D. in horticultural weed science, agronomy, and/or plant sciences. Salary is competitive, and is commensurate with background and experience. An attractive fringe benefits package is available. Applicants are to submit a letter of application, resume, academic transcripts, and the names and addresses of three references to: Dr. A. Martin Petrovic, Chair Search Committee, Department of Floriculture & Ornamental Horticulture, 20 Plant Science Building, Cornell University. Ithaca, NY 14853; telephone 607-255-1756, fax 607-255-9938, e-mail ampv@cornell.edu. The closing date of the application is September 15, 1997. Cornell University is an affirmative action, equal opportunity employer.

Assistant Professor
University of Arkansas, Fayetteville
(Received 08/04)
Research/teaching, 12-month, tenure-track position. Located at the University of Arkansas Alltme Laboratory, Fayetteville campus, to complement the weed science, crop physiology, and biotechnology programs in the Agronomy Department. Plan and conduct interdisciplinary basic and applied physiological research on herbicides used in Arkansas crops. Research will include plant biochemistry/metabolism to understand and develop novel strategies for the management of weeds in crops. Knowledge of molecular strategies and plant biochemistry for weed management and crop physiological tolerance to herbicides is desirable for interactions with other weed scientists and crop physiologists in the Department. Expected to develop a strong graduate training program in weed physiology. Teaching responsibilities may include introductory weed science, crop metabolism or biotechnological strategies for weed control. Must also 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 standing in plant physiology and biochemical aspects of herbicide activities, and genetic regulation. Starting date is January 1, 1998, or when suitable candidate is available. Submit a letter of application, resume, academic transcripts, and three letters of reference by November 15, 1997, to Dr. Derrick M. Oosterhuis, Department of Agronomy, University of Arkansas, Fayetteville, AR 72701; telephone 501-575-3093 or 3085; e-mail oosterhui@comp.uark.edu.

Assistant Professor
Michigan State University, East Lansing
(Received 08/15)
Responsibilities: Tenure-track research and teaching assistant professor position with research to be basic or applied, but with an emphasis on the fundamentals of reproductive development as it relates to issues important to Michigan's fruit industry. Possible research topics include, but are not limited to, flower bud formation, pollination and fruit set, fruit development, abscission, fruit maturity and quality, and defining roles of endogenous and exogenous hormones in these processes. Teaching includes contributing to an undergraduate course in horticultural physiology and a graduate course in reproductive development. Developing an externally funded, nationally recognized research program is expected. A Ph.D. in horticulture, plant physiology, or related field is required. Postdoctoral experience is preferred. A record of research productivity in plant physiology, biochemistry, molecular biology, or genetics and the application of these disciplines to one or more of the above research areas is highly desirable. Applications will be accepted through December 31, 1997, or until a qualified applicant is identified. Send curriculum vitae, graduate transcripts, publication list, description of research/teaching interests, and list of three references (names/address/phone nos.) to: Dr. Randy Beaudry, Search Committee Chair, Department of Horticulture, FSSB, Michigan State University, East Lansing, MI 48824-1325, telephone 517-353-376, fax 517-353-0249; e-mail beaudry@pilot.msu.edu. MSU is an AA/EEO/ADA institution.

Scientist
American Cyanimid Company
Princeton, New Jersey
(Received 08/13)
The Plant Biotechnology Group at the Agricultural Research Center of American Cyanimid Company, a subsidiary of Fortunes 100 American Home Products, is seeking a highly motivated scientist to work in the novel herbicide target program. The preferred candidate will possess experience with CDNA library construction, RNA isolation, yeast as well as bacterial expression systems, and strain development, and a working knowledge of plant genetics and molecular biology. Experience in protein purification and enzyme kinetics would be a plus, but not required. The ability to work independently and as an integral member of an interdisciplinary research effort is essential, as are excellent communication, organization, and problem-solving skills. Qualified candidates will possess a BS/MS degree in plant molecular biology or biochemistry, or equivalent laboratory experience. American Cyanimid offers a competitive compensation and benefits package, including 401(k) savings plan, and a convenient location midway between Philadelphia and New York. Forward your resume to: Employment Office, American Cyanimid Company, Agricultural Products Research Division, Department KK/KK, P.O. Box 400, Princeton, New Jersey 08543-0400. An equal opportunity employer m/f/d/v.

Assistant Professor
University of Western Ontario, Canada
(Received 09/01)
The Department of Plant Sciences of The University of Western Ontario is seeking applicants with research interests in Plant Cell Biology, Biochemistry, or Physiology to fill a tenure-track Assistant Professor position beginning July 1, 1998 (negotiable). This is a shortened version; please see the full advertisement at: http://www.uwo.ca/plantsc/. Applications including a curriculum vitae and copies of recent significant papers should be forwarded to Dr. Alan W. Day, Chair, Department of Plant Sciences, The University of Western Ontario, 1151 Richmond Street, London, Ontario, Canada N6A 5B7. Please provide the names and addresses of three external referees who would be willing to assess your work and abilities. Applications will be accepted until December 31, 1997, or until a suitable candidate is found. Positions are subject to budget approval. In accordance with Canadian Immigration requirements, this advertisement is directed to Canadian Citizens and Permanent Residents of Canada. The University of Western Ontario is committed to employment equity, welcomes diversity in the workplace, and encourages applications from all qualified individuals including women, members of visible minorities, aboriginal persons, and persons with disabilities.

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Plant Genomics & Molecular Biologist
The Monsanto Company, St. Louis, Missouri
(Received 09/08)
Monsanto's Metabolic Engineering Program is currently seeking the above professional to conduct and lead research in integrating advanced genomics technologies and the metabolic engineering of crop plants for agronomic trait enhancement. The successful candidate will be part of a multifunctional program that includes Molecular Biologists, Biochemists, and Plant Physiologists and will work in a team-based environment to genetically engineer plants. Specific responsibilities include identification of genes that have important genes to the program, gene isolation and manipulation, CDNA library construction and screening, development of scientific hypotheses and research plans, technical communication, and internal and external interactions with the Program/Company. We require a Ph.D. and postdoctoral experience (or the equivalent). Experience in Biochemistry, Genetics, and Physiology is preferred. Familiarity with Bioinformatics and analysis of gene function is desirable. The preferred candidate will have strengths in the following competencies - critical thinking, innovation, strong technical and communication skills, team contribution, and commitment to results and organization. We offer a competitive compensation and benefits package. For consideration, please send your application letter and resume including contact information for at least three references to: The Monsanto Company, Attn: Jene Alldredge, Job Code: MB, 800 N. Lindbergh Blvd., Mail Zone: E3SB, St. Louis, Missouri 63167. Visit our website at www.monsanto.com. EEO/AA employer M/F/DV. MONSANTO.
Assistant Professor
University of Florida, Gainesville
(Received 09/16)
The Department of Botany at the University of Florida invites applications for a tenure-track Assistant Professor position in plant physiology to begin in August 1998. Preference will be given to applicants with postdoctoral experience who incorporate molecular techniques in some aspect of stress physiology, or in a research area that complements the Department's strengths in signal transduction, photosynthesis, and plant responses to the environment. The University and Department place a high priority on teaching, thus candidates will be expected to have excellent communication skills and a strong commitment to both undergraduate and graduate teaching. Applicants should arrange to have a curriculum vitae, brief statements of future research goals and teaching philosophy, reprints of published papers, and three letters of recommendation mailed to: Plant Physiology Search Committee, Department of Botany, 220 Bartram Hall, University of Florida, Gainesville, FL 32611-8526. Applications will be accepted through November 30, 1997. For questions, e-mail Dr. George Bowes at bowes@hervm.nercd.ufl.edu. Further information is available on the Web: http://www.class.ufl.edu/botany/ and http://www.ufl.edu. The University is an affirmative action, equal opportunity institution.

Assistant Professorship
Colorado State University, Fort Collins
(Received 10/01)
The Department of Biology at Colorado State University invites applications for a tenure-track position in plant physiology. Candidates must have a Ph.D. postdoctoral experience and expertise in molecular biology or biochemistry is preferred. Successful candidate is expected to develop a strong research and teaching program. To apply, send letter stating teaching and research interests, a curriculum vitae, three research publications, and addresses and e-mail addresses of three potential referees to: Connie Van Horn, Plant Physiologist Search Committee, Department of Biology, Colorado State University, Fort Collins, CO 80523; e-mail connielu@lamar.colostate.edu. All materials are due by November 15, 1997. Search may be extended if suitable candidates are not found. Ethnic minorities and women are encouraged to apply. CSU is an AA/EO Employer. Office of equal opportunity, 101 Student Services.

Assistant Scientist
The Samuel Roberts Noble Foundation, Inc.
Ardmore, Oklahoma
(Received 10/02)
The Samuel Roberts Noble Foundation, Inc. is seeking a specialist in the area of molecular marker/genomics research and development for their new Forage Biotechnology Group (FBG). The purpose of the FBG is to develop improved forages for the southern Great Plains, and in the process, advance the science of forages. The position will be involved with development of marker-assisted selection protocols, gene discovery, and genomics research in the context of the goals of the FBG. Qualifications include a Ph.D. in an appropriate area of biology, plus additional experience in molecular marker/genomics research and technology. Salary will be commensurate with qualifications and experience. Health and retirement benefits provided. Send letter of application outlining potential research objectives, a resume, and arrange for three letters of reference to be sent to: ATTN: Genomics Specialist, Human Resources, The Noble Foundation, PO Box 2180, Ardmore, OK 73402.

POSTDOCTORAL POSITIONS

Postdoctoral Position
Oregon State University, Corvallis
(Received 07/22)
A postdoctoral position (faculty research associate) is available at Oregon State University to study auxin signal transduction in tomato using molecular genetic approaches. Emphasis will be on the positional cloning and characterization of the gene identified by the diageotropica mutation. Research experience in molecular biology and genetics is required. Previous experience with map-based cloning is preferred. Please send a curriculum vitae, statement of research interests/experience, and the names, telephone numbers, and e-mail addresses of three references to: Dr. Terri L. Lomax, Department of Botany and Plant Pathology, Oregon State University, Corvallis, OR 97331-2902; fax 541-737-3573, e-mail lomax@bcc.orst.edu.

Postdoctoral Position
The Samuel Roberts Noble Foundation
Ardmore, Oklahoma
(Received 07/24)
A postdoctoral research position is available immediately to characterize and clone enzymes involved in isoflavonoid phytoalexin biosynthesis in legumes, for use in genetically engineering the synthesis of novel antimicrobial compounds in alfalfa. Applicants must have a strong background in plant biochemistry and enzyme purification (particularly membrane proteins), or demonstrated experience with cloning and vector construction (particularly microbial expression systems). Send curriculum vitae, letter of research interests, and names and addresses of three references to: Dr. Nancy L. Paiva, Plant Biology Division, The Noble Foundation, P.O. Box 2180, Ardmore, OK 73402; fax 405-221-7380.

Postdoctoral Position
Washington State University, Pullman
(Received 07/25)
A postdoctoral position is available to study the sorting of mRNAs to subdomains of the endoplasmic reticulum membrane complex. We have previously demonstrated that the mRNAs of the rice storage proteins are localized to distinct ER membranes (Li et al. Cell, 1993, 72:869-879) and we have extended these studies to yeast. Research will involve the use of both molecular cellular and genetic approaches to understand the mRNA sorting mechanism in this unicellular eucaryote. Please send a curriculum vitae and names of three references to: Thomas W. Okita, Institute of Biological Chemistry, P. O. Box 636340, Washington State University, Pullman, WA 99164-6340; telephone 509-335-3391, e-mail tokita@wsu.edu.

Postdoctoral Position
Penn State University, University Park
(Received 07/25)
A postdoctoral position, funded by USDA-NRICGP, is available to study nutrient uptake kinetics and respiration of intact apple roots in the greenhouse and field. The research is directed at estimating root lifespan from a cost:benefit perspective where respiration and uptake kinetics will be incorporated into a root lifespan model and compared to field observations of root lifespan. Applicants should have a desire to work on field systems and experience with ion-specific electrodes, root physiology, and modeling. Send a cover letter, curriculum vitae, university transcripts, and names of three references to: David Eisenstaedt, Department of Horticulture, Penn State University, University Park, PA 16802; telephone 814-863-3371, fax 814-863-6139, e-mail dme9@psu.edu.

Postdoctoral Position
Salk Institute for Biological Studies
San Diego, California
(Received 07/30)
A postdoctoral position is available immediately to work on the molecular-genetic, genetic, and physiological dissection of mitogenic signaling pathways involved in cell division activation in Arabidopsis. We have recently shown that increased abundance of a mitotic cyclin is sufficient to increase growth rates in established root meristems, presumably by direct stimulation of cell division activity (Doerner et. al, Nature 1996). This observation suggests that cell division control molecules are targets of mitogenic signaling pathways. This project will focus on the components of signaling pathways responsible for cell division activation through the regulation of cyclin activity. Suitable candidates should have a strong background in molecular biology. A background in genetics would be helpful, but is not essential. For further information, please contact: doerner@salk.edu. For applications, send a cover letter, curriculum vitae, and references to: Dr. Peter Doerner, Plant Biology Laboratory, The Salk Institute, San Diego, California; telephone: 619-455-1466, e-mail doerner@salk.edu.
Postdoctoral Position
The Ohio State University, Columbus
(Received 08/07)
A position is available to study genes controlling cell polarity in Arabidopsis pollen. Haploid pollen provides many advantages for genetic analyses of important cell biological problems, e.g., cellular polarity and cytoskeletal organization. The position will be encouraged to develop independent projects using this system. Experience in molecular biology or genetics is required, in particular experience in Arabidopsis genetics and microscopy. Position remains open until appropriate candidate is identified. Send curriculum vitae, statement of interest and experience, and names of three references to: Zhenbiao Yang, Plant Biotechnology Center, 1060 Carmack Road, Columbus, OH 43210; e-mail yang.147@osu.edu, telephone 614-292-8323, fax 614-292-5379.

Postdoctoral Position
University of Arizona, Tucson
(Received 08/11)
A postdoctoral research position is available to study molecular genetic and cell biological aspects of maize endosperm development. The research will focus on the regulation of DNA endoreduplication and the role of the cytoskeleton. Candidates must have a Ph.D. with appropriate experience in genetics, protein biochemistry, and ultrastructural analyses. Salary commensurate with qualifications and experience. Send letter of application, resume, and three letters of reference to: Dr. Brian Larkins, Department of Plant Sciences, University of Arizona, Tucson 85721; fax 520-621-3697. The position is open until a suitable candidate is found. The University of Arizona is an equal opportunity/affirmative action employer.

Postdoctoral Position
Miami University, Oxford, Ohio
(Received 08/13)
A postdoctoral research position is available immediately to carry out a biochemical and molecular-genetic analysis of genes coding for fatty acid elongase condensing enzymes. We have cloned several unique fatty acid elongase genes and are interested in using them to modify the composition of oil seeds and alter surface wax composition. Applicants should have a strong background in plant biochemistry and molecular biology. The position is for two or three years. Please send curriculum vitae, including research interests, and three letters of reference to: Dr. Jan Jaworski, Chemistry and Biochemistry, Miami University, Oxford, OH 45056; fax 513-589-5715, e-mail jaworja@m 이루.edu.

Postdoctoral Position
Michigan State University, East Lansing
(Received 08/15)
A postdoctoral position is available to study abscisic acid metabolism with emphasis on the cleavage reaction of carotenoids (and its regulation during development and by environmental factors) as the key regulatory step in the abscisic acid biosynthetic pathway (Science 276:1872-1874 (1997)). Applicants should have research experience in biochemistry and molecular biology, and preferably with instrumentation for analysis of carotenoids and abscisic acid. Send letter of application with curriculum vitae and three references to: Dr. Jan Zeevaart, MSU-DOE Plant Research Laboratory, Michigan State University, East Lansing, MI 48824-1312; telephone 517-353-3398, fax 517-353-9168; e-mail zeevaart@plrl.msu.edu.

Postdoctoral Researcher
State University of New York, Buffalo
(Received 08/20)
USDA funds are available to hire a postdoctoral researcher. This project has two aspects: One is the simultaneous measure of turgor pressure, membrane electrophysiological parameters, and cytoplasmic streaming, to derive a model for turgor regulation in the salt-tolerant alga, Chlorella vulgaris. This is done by the simultaneous insertion of three probes—a transducer-based pressure probe, a voltage-sensing microelectrode, and a current-injection microelectrode—into a single giant cell, and monitoring the changes after osmotic stress. The second is patch-clamp study of the plasma membrane and tonoplast to investigate channels predicted to be of importance by the developed model. The position will be encouraged to develop independent projects using this system. Experience in Arabidopsis genetics and microscopy is required. Send letter of application with curriculum vitae and three references to: Contact M. A. Bisson, Department of Biological Sciences, Cook Hall 109, State University of New York, Buffalo, NY 14260-1300, USA; telephone 716-645-2550, e-mail bisson@acsu.buffalo.edu.

Postdoctoral Position
Boyce Thompson Institute
Cornell University, Ithaca, New York
(Received 08/25)
A postdoctoral position is available to study the post-transcriptional regulation of chloroplast gene expression, focusing on the roles of nuclear factors and their chloroplast targets in modulating RNA stability and translation initiation (Science 265, Plant Cell 8:1409 and 9:825, Genetics 145:935, and JBC 227:12874). Candidates with experience in recombinant DNA techniques and protein analysis should send their curriculum vitae, a statement of career goals, and the names of three references to: Department of Chemistry, Duke University, P.O. Box 90346, Durham, NC 27708-0346; fax 919-660-1591.

Postdoctoral Positions
University of Minnesota, St. Paul
(Received 08/25)
Two research associate positions are available to characterize the lignon depolymerase gene from Thrometis cinerea, and to produce recombinant enzyme and optimize its activity. Ph.D. in molecular biology, biochemistry, or related field is desired. Experience in gene cloning and analyses of gene expression, or protein purification and production of recombinant enzymes through high-pressure systems is required. Annual salary of $27,800 - $30,800 for 1 to 3 years. Send resume, graduate transcripts, names, addresses, telephone numbers, and e-mail addresses of three references to: Dr. Glenn Howe, Forest Genetics Group, 203 Kasslett Laboratory, University of Minnesota, St. Paul, MN 55108-6128; telephone 612/242-7322, e-mail howex003@maroon.tc.umn.edu. Equal opportunity educator and employer.

Postdoctoral Position
Duke University, Durham, North Carolina
(Received 08/25)
Professor M.C. Pearaung seeks a postdoctoral fellow or tech with a background in the genetics and molecular biology of aflatoxin biosynthesis. Experience in protein extraction/purification and assays is desirable. The research is focused on the role of aflatoxin biosynthesis, particularly 1-aminocyclopropane-1-carboxylic acid (ACC) synthase. The project will address enzyme isoforms, their inhibition, and their expression in different tissues. Send curriculum vitae, publication list, and references with contact information to: Department of Chemistry, Duke University, P.O. Box 90346, Durham, NC 27708-0346; fax 919-660-1591.

Postdoctoral Research Associate
USDG, ARS, NCAUR, Peoria, Illinois
(Received 08/29)
Incentive will be given to postdoctoral research involving mechanisms of inhibition of aflatoxin biosynthesis, enzymes and assays for protein/peptide inhibitors of Aspergillus flavus growth and aflatoxin biosynthesis. Candidates must have a general professional knowledge of biochemistry and specific knowledge of methods for determining enzyme-substrate interactions, and enzyme inhibition as
well as skill and knowledge of protein and/or peptide separation methods. Ph.D. is required and should have been awarded within the last 4 years. Position is funded for two years. Salary commensurate with experience ($37,507 - $58,442 per year). Benefits available. Position will be open until filled. For information on the position, contact Dr. Robert Norton at 309-681-6251 or http://www.nortonra@mail.ncaur.usda.gov. Applications in response to this advertisement should be marked RA-97-46L, and sent to: Dr. Robert Norton, USDA/ARS/NCAR, 1815 N. University Street, Peoria, IL 61604. USDA/ARS is an equal opportunity employer.

Postdoctoral Position
University of Minnesota, USDA/ARS
Grand Forks
(Received 09/03)
A Ph.D. candidate is sought to utilize biochemical/molecular approaches to study the allelic differences, expression patterns, and physicochemical and catalytic properties of isoforms of UDP-glucose pyrophosphorylase as they relate to cold-stress tolerance and expression in potato plants (Plant Physiol. 113: 511, 1997; Plant Physiol. 101: 1073, 1993). Candidates should have a working knowledge and experience in protein purification and kinetic analysis techniques. Experience in the expression/purification of proteins from bacterial systems would be in the candidate's favor. Salary will be $27,000 - $30,000, depending on experience. The position is available immediately. Those interested in applying should contact Dr. Joe Sowokinos, 311 5th Avenue NE, East Grand Forks, MN 56721; telephone 218-773-2207, e-mail sowok001@maroon.tc.umn.edu. The University of Minnesota is an equal opportunity employer.

Postdoctoral Position
University of Geneva, Geneva, New York
(Received 9/11)
A postdoctoral position is available immediately to study the molecular aspects of benzalacetone synthase, a member of the aromatic polyketide synthase family. For recent publications see Plant Physiology 110: 791-799 (1996); Phytochemistry 35: 623-626 (1994) and Plant Cell Tissue Organ Cult. 37: 213-216 (1994). Candidates must have experience in recombinant DNA techniques; familiarity with protein purification and analysis is preferred. Please send curriculum vitae, a brief description of research and career goals, and the names of three references to: Ceca Hoedt, Department of Food Science and Technology, Cornell University, Ithaca, NY 14853, or e-mail to gh10@cornell.edu. Applications will be accepted until the position is filled. Cornell University is an affirmative action/equal opportunity employer.

Postdoctoral Position
University of Nebraska, Lincoln
(Received 09/11)
A research position will become available in the Winter of 1998 to study the regulatory phosphorylation of leaf and/or legume root-nodule C-metabolizing enzymes. The focus will be to continue our ongoing biochemical and molecular/cellular analyses of the protein-Ser/Thr kinases, phosphatases, and the requisite signal transduction chains that target PEP carboxylase (see e.g. AR Plant Physiol. 119: 2293 [1996]; TIPS 2230 [1997]; ABB 343:260 [1997]) and Suc synthase (IEBS 410: 126 [1997]). Research experience with protein phosphorylation, protein chemistry, and/or molecular/cellular biology techniques is required. Please send curriculum vitae and names/e-mail addresses of two references to: Dr. Raymond Chollet, Department of Biochemistry, University of Nebraska, Lincoln, NE 68588-0664; e-mail rchollet@unlinfo.unl.edu, fax 402-472-7842.

Postdoctoral Position
Texas A&M University, College Station
(Received 09/11)
A postdoctoral position is available immediately to study the molecular biology and role of sex pheromones in the biology of the ascomycete Cryptococcus parasitica. Previous experience with molecular biology, including protein purification and DNA cloning, is desirable. The individual will join a large group of other postdocs and students participating in the interdepartmental Program for the Biology of filamentous fungi at Texas A&M University. Please submit applications to Dr. Neal Van Allen, Department of Plant Pathology and Microbiology, Texas A&M University, College Station, TX 77843-2132, e-mail vanallenn@tamu.edu. Texas A&M University is an equal employment opportunity employer.

Postdoctoral Research Associate
North Dakota State University, Fargo
(Received 9/15)
A postdoctoral research associate position is available immediately in the Department of Plant Pathology at North Dakota State University (NDSU). The individual will conduct basic and applied molecular biology research on regulation of carbohydrate metabolism of potato (J Plant Physiol, 1996, 147:644) and may work on other transgenic systems for disease and quality. Candidates must have a Ph.D. in molecular biology, biochemistry or plant sciences, training in molecular techniques, and the ability to work collegially. Send a letter of application, a curriculum vitae and addresses of three references to: Gary Secor, Waller Hall 366, North Dakota State University, Fargo, ND 58105; telephone 701-231-7076; fax 701-231-7851, e-mail secor@plains.nodak.edu. Screening will begin October 3, 1997, and continue until the position is filled. NDSU is an equal opportunity institution.

Postdoctoral Research Position
Pacific Northwest National Laboratory
Richland, Washington
(Received 09/16)
A postdoctoral research position is available after Oct. 1, 1997, for the isolation and characterization of novel plant promoters. Applicants should possess a doctoral degree in botany, molecular biology, or a related field, and have documented skills and extensive experience in molecular biology and biochemical techniques. Please send a curriculum vitae, a brief statement of research experience, and the names of references to: Brian S. Hooker, Bioprocessing Group, Environmental Technology Division, Pacific Northwest National Laboratory, Richland, WA 99352; e-mail bs_hooker@pnl.gov.

Postdoctoral Position
Boyce Thompson Institute at Cornell
Ithaca, New York
(Received 09/22)
A postdoctoral position is available to study the regulation of tryptophan biosynthesis in Arabidopsis. This laboratory is using the available tryptophan biosynthetic mutants, cloned genes, and biochemical reagents (see Plant Cell, 1996, 8:2235, and Plant J., 1997, 11:455) to study the regulation of aromatic amino acid biosynthesis in response to biotic and abiotic environmental stress. Experience in biochemistry or molecular classical genetics is essential. Submit a curriculum vitae, a list of publications, and have four reference letters sent directly to: Robert Last, Boyce Thompson Institute, Tower Road, Ithaca, NY 14853-1801; fax 607-255-6695. The Boyce
Thompson Institute is an equal opportunity, affirmative action employer. See http://www.bio.cornell.edu/genetics last/lastHome for more details on the laboratory.

Postdoctoral Position
Pioneer Hi-Bred International, Johnston, Iowa

(Received 09/26)

A postdoctoral position is immediately available to study the control of apoptosis (programmed cell death) in higher plant cells. In particular, the project will focus on the pathway of protein N-glycosylation and glucocerebroside biosynthesis within the endoplasmic reticulum as possible control points for apoptosis. A strong background in the molecular biology of higher plants (Arabidopsis and/or maize) is required. Experience in yeast genetics would also be advantageous. This position requires experience in both molecular biology and modern methods of analyzing protein/protein interactions (Eukaryotic recombiant protein expression, two hybrid systems and phage display). For further information contact: Sean Coughlan, Pioneer Hi-Bred International, P.O. Box 1004, 7300 NW 62nd Avenue, Johnston, IA 50131-1004; telephone 515-270-4356, fax 515-254-2619, e-mail CoughlanS@phibred.com.

Postdoctoral position
University of Hawaii, Honolulu

(Received 09/26)

NSF-supported project involves the development of a transgenic plant cell culture system to produce high-value products. The approach involves the use of a newly cloned plant promoter and signal sequences for the expression and secretion of foreign proteins. Experience in transformation of cultured plant cells and all standard techniques of plant molecular biology is essential. The position is available immediately. Send letter of application including curriculum vitae, statement of research goals and experience, and names, addresses, and phone numbers of three references to: Dr. Winston Su, Department of Biosystems Engineering, University of Hawaii, Honolulu, HI 96822; fax 808-956-9208; e-mail wusu@hawaii.edu; and to Dr. Sam Sun, Department of Plant Molecular Physiology, University of Hawaii, Honolulu, HI 96822; e-mail ssun@hawaii.edu.

Postdoctoral Research Associate
The Fort Valley State College
Fort Valley, Georgia

(Received 09/26)

A postdoctoral position is available to establish tissue culture procedures and protocols, develop a regeneration system using sweet potato explants, develop a gene-transfer system and develop transgenic plants using biolistic gun and Agrobacterium-mediated approaches, characterize transgenic plants, and help determine DNA sequence and construct vectors. Qualifications include a Ph.D. in plant science with proven experience in plant regeneration and transformation and knowledge of molecular biology techniques. Send a letter of application, a current resume, copies of graduate and undergraduate transcripts and research publications, and the names, addresses, and telephone numbers of at least three professional references to: Search Committee, c/o Dr. Sarwan Dhir, Agricultural Research Station, P.O. Box 5384, Fort Valley State University, Fort Valley, Georgia 31030-3298; telephone 912-825-6825/6925, fax 912-825-6376, e-mail dhirs0@email.fvsu.peachnet.edu. Applications will be accepted until the position is filled. Salary is commensurate with training and experience.

Postdoctoral Research Associate
Fort Valley State University, Fort Valley, Georgia

(Received 09/26)

Isolate and determine the toxicity of cryllA BT protein against sweet potato weevil, construct vectors with cryllA genes, and develop gene transfer formation system using the biolistic gun and Agrobacterium-mediated approach; regenerate and characterize transgenic plants for BT gene/protein. Qualifications include a Ph.D. in plant science or related discipline, experience in PCR and northern/western blotting, plant regeneration and transformation and insect handling experience is desirable. Send a letter of application; a current resume; copies of graduate and undergraduate transcripts, and research publications, and the names, addresses, and telephone numbers of at least three professional references to: Dr. Sarwan Dhir, Agricultural Research Station, Post Office Box 5384, Fort Valley State University, Fort Valley, GA 31030-3298; fax 912-825-6926/6825, fax 912-825-6376, e-mail dhirs0@email.fvsu.peachnet.edu. Review of applications will begin on September 30, 1997. Applications will be received until position is filled. Salary is competitive with training and experience. The beginning date is November 1997, or later.

Postdoctoral Position
University of Wisconsin, Madison

(Received 09/30)

A position is available to study the ubiquitin-dependent proteolytic pathway in Arabidopsis. Successful applicants will join a larger research group using a variety of techniques to define the pathway's roles in plant metabolism, development, growth, and response to stress (see Vierstra, R.D. [1996] Plant Mol Biol 32: 275-302). A focus will be to exploit a large collection of recently isolated insertional mutants affecting the pathway. Experience in molecular and biochemical techniques is necessary, but prior work with plants is not required. Send or e-mail a resume, description of research experience, and the names of three references to: Dr. Richard D. Vierstra, Cell and Molecular Biology Program, University of Wisconsin-Madison, Madison, WI 53706; e-mail vierstra@facstaff.wisc.edu.

Postdoctoral Position
University of Wisconsin-Madison

(Received 09/30)

A position is available to study the mechanism of action of the phytochrome photoreceptor family in Arabidopsis. Research will involve biochemical, genetic, and reverse genetic approaches to identify and analyze factors that affect phytochrome A function and its turnover by the ubiquitin pathway. One factor may be responsible for down-regulating phytochrome A activity and thus involved in light adaptation. Experience in molecular and biochemical techniques is necessary, but prior work with plants is not required. Send or e-mail a resume, description of research experience, and the names of three references to: Dr. Richard D. Vierstra, Cell and Molecular Biology Program, University of Wisconsin-Madison, Madison, WI 53706; e-mail vierstra@facstaff.wisc.edu.

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

Senior Research Associate
DEKALB Genetics Corporation
Mystic, Connecticut

(Received 07/28)

DEKALB Genetics Corporation is the fastest growing agricultural seed company in the U.S. We are seeking an innovative, highly skilled researcher to join a multidisciplinary team focused on genetic engineering solutions for pest control in transgenic corn. Molecular biology experience required includes: gene cloning, plant expression vector construction; analysis; PCR-mediated gene modification; northern and Southern hybridization; in vitro transcription/translation; protein production in bacterial and yeast expression systems. Familiarity with molecular application software for Mac and PC, as well as intranet-facilitated data analysis are essential. The preferred candidate will be capable of critical thinking and innovation, have strong technical and communication skills, work well in a team environment, and be committed to results and organization. Applicants should have an M.S. degree and three years relevant experience or a B.S. degree and six years relevant experience, industrial experience is preferred. EO/AA. Competitive salary and benefits. Send cover letter quoting the reference letters and job title, resume or curriculum vitae, and transcripts to: DEKALB Genetics Corporation, Attn: Human Resources, 62 Maritime Drive, Mystic, CT 06355; fax 860-572-4240. Applications postmarked on or before August 15, 1997, will be guaranteed consideration.

Senior Research Assistant
DEKALB Genetics Corporation
Mystic, Connecticut

(Received 07/28)

DEKALB Genetics Corporation is the fastest growing agricultural seed company in the U.S. We are seeking an innovative, highly skilled researcher to join a team focused on quality control analysis for transgenic corn breeding. Successful applicant will implement assays to characterize the molecular events associated with the production of genetically modified plants, including plasmid and genomic DNA isolation, Southern and northern blot analysis, DNA probe construction, PCR, and gene cloning. Attention to detail and adherence to prescribed procedures and data management are necessities. Manual dexterity and an ability to operate laboratory...
instruments such as automatic pipetors/ workstations, high-throughput thermal cyclers, and spectrophotometers are required. Knowledge of word processing, spreadsheets, and DNA analysis software is expected. Excellent interpersonal and communication skills are essential. Requires a B.S. in molecular biology with at least two years laboratory experience, industrial experience preferred. EOE/AA. Competitive salary and benefits. Send cover letter quoting the reference letters and job title, résumé or curriculum vitae, and copies of transcripts to: DEKALB Genetics Corporation, Attn: Human Resources, 62 Maritime Drive, Mystic, CT 06355; fax 605-572-4240. Applications postmarked on or before August 15, 1997, will be guaranteed consideration.

Project Leader DEKALB Genetics Corporation Mystic, Connecticut (Received 07/28) DEKALB Genetics Corporation is the fastest growing agricultural seed company in the U.S. To fully utilize our germplasm and technology positions, we are expanding our efforts to study and develop transgenes to increase yield in corn. We are looking for motivated and independent researchers to help initiate, direct, and implement research objects in this project area. Candidates should have a Ph.D. in a relevant field, 2+ years of experience, and a background in plant physiology and experience in molecular techniques used to isolate genes and study gene expression in plants. Expertise in the manipulation of biosynthetic pathways is preferred. Position located at: DEKALB’s biotechnology research facility in Mystic, Connecticut, a scenic shoreline community located on Long Island Sound, halfway between New York and Boston. DEKALB offers competitive compensation, attractive benefits package, and an outstanding work environment. EOE/AA. Send cover letter, résumé, and the names, addresses and phone numbers of three professional references to: DEKALB Genetics Corporation, Agronomic Traits Group, 62 Maritime Drive, Mystic, CT 06355-1958; fax 860-572-5260.

FELLOWSHIPS, TRAINEESHIPS, GRADUATE ASSISTANTSHIPS, ETC.

Undergraduate Summer Research Fellowships in “Radical” Biology The Pennsylvania State University University Park (Received 08/25) 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 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 heff.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).

Undergraduate Research Internships in Plant Molecular & Cellular Biology University of Florida, Gainesville (Received 09/08) The Plant Molecular and Cellular Biology (PMCB) Program at the University of Florida has a research internship program for Juniors who have a keen interest in attending graduate school and pursuing an advanced degree in plant molecular biology, genetics, and biochemistry. The PMCB Program is an interdisciplinary graduate-degree granting unit that draws its 22 Faculty from eight departments in the College of Agriculture/Institute of Food & Agricultural Sciences, and from the College of Liberal Arts & Sciences. Students selected for these full-time research internships will work closely with PMCB faculty members in their laboratories on research projects that will teach experimental rationale and design as well as give hands-on experience with a wide array of molecular/genetic techniques and 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 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 must be U.S. citizens and have a keen interest in attending graduate school and pursuing an advanced degree in plant molecular biology, genetics, and biochemistry. Applications are accepted on a rolling basis. Please send 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 heff.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 (Received 08/29) Half-time research assistantships are available in Purdue University’s Center for Plant Environmental Stress Physiology for exceptional students interested in the physiology, biochemistry, and molecular biology of plant responses to abiotic stresses. Current efforts include (1) mechanisms of freezing injury and temperature acclimation in plants; (2) adaptation of plants to oxidative stress; (3) adaptive responses of plants to heavy metals; (4) molecular determinants of abiotic stress tolerance; (5) physiological adaptations to drought and salinity stress; (6) molecular responses to nutrient stress; (7) biochemistry of osmotically compatible solutes; and (8) oxidative stress responses in plants. Assistantships carry a stipend of $14,000 to $17,000 plus a $400 travel allowance to participate in professional meetings. For further information or an application, 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/cpsesp/.
related instrumentation used in the molecular plant sciences. These full-time internships carry a subsistence stipend of approximately $3,200 (i.e., $240 per week) for a Fall or Spring Semester or for the two Summer terms. Some adjustments in arrival and departure times can be made to accommodate students who are attending colleges/universities with time schedules that differ from the University of Florida. Students pursuing B.S. degrees in plant physiology, biochemistry, molecular biology/genetics, microbiology, cell biology, or related disciplines in the quantitative sciences will be highly competitive in the selection process. A grade point average of 3.5 or better is desirable. For more information contact: PMCB@gnv.ifas.ufl.edu.

Postdoctoral and Graduate Student Research Positions
University of Arizona, Tucson
(Repeat)
Information can be obtained from our Website: http://ag.arizona.edu/pii-rtg. The University of Arizona is an equal opportunity/affirmative action employer. Women and minorities are urged to apply. (Details July/August 1997.)

Graduate Research Assistantships
Texas A&M Vegetable Improvement Center
College Station
(Repeat)
For information contact: Dr. Leonard Pike or Dr. Jim Giovannoni, Vegetable Improvement Center, 1500 Research Parkway, Suite 120, Texas A&M University Research Park, College Station, TX 77843-2119; telephone 409-862-4521, fax 409-862-4522, e-mail for Leonard Pike (l-pike@tamu.edu), Jim Giovannoni (jg@unix.tamu.edu). Texas A&M is an equal opportunity employer. Women and minorities are encouraged to apply. (Details July/August 1997.)

Graduate Research Assistantship
University of Florida, Gainesville
(Repeat)
Contact: Drs. Maria Gallo-Meagher (mgmea@gnv.ifas.ufl.edu), or Donn G. Shilling (dgs@gnv.ifas.ufl.edu), Agronomy Department, 2183 McCarty Hall, P.O. Box 110300, University of Florida, Gainesville, FL 32611-0300; telephone: 352-392-1823, fax 352-392-7248. Visit our web site at http://www.ifas.ufl.edu/~agroweb/. (Details July/August 1997.)

JSPP Postdoctoral Fellowships
National Institute for Basic Biology (NIBB)
Okazaki, Japan
(Repeat)
For more information, contact Dr. Norio Murata at NIBB fax 81-546-54-4866, e-mail Murata@nibb.ac.jp. (Details July/August 1997.)
For your convenience, keep this listing of extension numbers and e-mail addresses handy when you contact ASPP headquarters so that you can reach the person best able to assist you.

Our office telephone number is 301-251-0560

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*Subscriptions, Institutional: Tracey Heichl, Fulco, 201-627-2427, ext. 132

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