AN OFFICIAL PUBLICATION OF THE SOCIETY FOR IN VITRO BIOLOGY

In Vitro Report

VOL. 37, NO. 3 • JULY - SEPT 2003

President's Report

Nobody's Bull and Branding

Sandra L. Schneider, DrPH

I tried to imagine the impact of looking out the kitchen window and coming eye to eye with a massive Longhorn bull.

The impact of a Longhorn in the garden, on top of total fatigue from pulling an "all-nighter" to finish a grant application, shoving peanut butter and jelly sandwiches into sacks for the kids, dreading the 40 miles drive into work, running late for a staff meeting and life in general, must have seemed surreal. This story was told by friend and colleague, Dr. Linda Schott, Professor of History and Texas cattle rancher and does have relevance to society issues.

As it turned out, the bull did not appear to belong to anyone in the area. Consequently, he just made himself at home, feasted on lush grass and treats from the feed-store, fit into the hectic pace of professional life and grew the ranch herd. But the seven-year comfort of seeing the Longhorn ceased one morning, as abruptly as it started. The bull and herd vanished without so much as an open gate or tire tracks to implicate rustlers. Life on the academic and research fast track were interrupted only to find out that the authorities could do nothing about recovering a bull and cows that had not been branded.

In a business context, a brand or branding process identifies and helps differentiate the goods or services of one seller from another. The brand name is important to the consumer as it: simplifies and facilitates the processing of information needed to determine options; and provides confidence that a correct decision has been made to satisfy quality associated with status needs. Let's face it; brand names shape the core of our human nature impressions and immediate assumptions about quality for products we have never used.

As a scientific society, has the importance of understanding the program needs and membership services necessary to target the long-term member, i.e., those with brand loyalty, been lost in the growth and success from past years? Is the SIVB brand of Congress programs and services appropriately identified and differentiated from those of competing society and scientific forums?

The past membership and Congress attendance of the SIVB grew with the availability of federal funds that allowed researchers more freedom to attend scientific conferences. How can the Society now attract the *in vitro* scientist that is interested in being a dedicated and "brand

Continued on page 6

Public Policy Alerts Now Available on SIVB Website

The Public Policy Committee is a standing committee of the Society for In Vitro Biology (SIVB). The Committee assists Society members and the scientific community-at-large to better understand in vitro biology, biotechnology and the current research and public policy issues affecting the scientific community. The Committee supports the SIVB to interact with members of Congress and other governmental officials for the purpose of giving scientific advice on funding priorities and issues relevant to in vitro biology and biotechnology.

Public policy alerts are available on the SIVB website (www.sivb.org). When an issue of importance to the membership arises, the information will be posted on the Public Policy website page. Policy information will be date-stamped and updated. A flashing alert will notify the membership of new policy information.

Currently, there are three public policy issues listed on the SIVB website. Visit the SIVB website to check for public policy issues. If you have information you feel would benefit the membership, contact Paul Price, Chair Public Policy paul.price@invitrogen.com.

Paul Price

This Issue

2003 SIVB Awards

Plant Fellow Awards

The Plant Fellow Award recognizes current members of the SIVB who have been active members for at least 10 years. A Fellow has made outstanding contributions in their area of specialization or discipline to include research, teaching, and adminis - tration in public, government, academic, or private industry activities. Information on additional award winners will be provided in future issues of the In Vitro Report.

Mary Ann Lila, Ph.D.

Mary Ann Lila, Ph.D.
University of Illinois

Mary Ann Lila had decided back in high school that plant sciences might be the best career pursuit. However, it wasn't until she was introduced to plant tissue culture, during her graduate program at UW Madison in the early 1980s, that she suddenly knew with full certainty that she'd found the ideal focus for her energies and enthusiasm. "You could say that everything 'gelled' at that point.....but.....that would be a very bad pun, wouldn't it?" said Mary Ann. "I was drawn to in vitro strategies for manipulating plants, because it represented the cutting edge of science, it crossed all the boundaries between plant species (agronomic, horticultural, or wild), and it provided a beautiful venue for melding plant science with research in animal and nutritional sciences."

In the course of fulfilling those goals, Dr. Lila has successfully guided cross-disciplinary research teams in national and international arenas, bridging the realms of biotechnology, horticultural sciences, pharmacology, human nutrition, and engineering. Lila's research emphasizes integration of biological and engineering approaches to decipher complex problems. Currently, her team is determining the mechanisms by which plant secondary products, particularly bioflavonoids, intervene in human health disorders. In vitro culture of the plants that are donors for bioactive phytochemicals has been enormously advantageous in this pursuit, for several reasons. In vitro cell cultures of the plant materials (Lila's group works extensively with berry germplasm) lack many of the interfering compounds (pectins, excess polysaccharides and enzymes) which typically interfere with extraction of flavonoids from whole plants. Elicitation of the cell cultures, in order to provoke accumulation of a stress-related secondary product, is also facilitated in the in vitro culture arena. Furthermore, the cell cultures can accumulate these bioactive phytochemicals in much higher concentrations than found in the berry, and within a much shorter time frame. Recently, Lila's lab group developed a customized enclosed chamber system for the safe introduction of radio labeled precursors to metabolizing cell cultures, so that the flavonoid products can be isolated with sufficient ^{14}C enrichment to allow them to track the metabolic fate in animal models. As there is no commercial source for these natural, high molecular weight polyphenolic compounds, and they can not be synthesized, this development opens up several new doors for understanding how functional food and nutraceutical components in the diet work to prevent or counteract human disease.

In other research that has orchestrated engineering into biological pursuits, Mary Ann was one of the pioneers bringing image analysis to analysis of biological and in vitro experiments, and has designed special large scale bioreactor strategies for recovery of flavonoid products.

Mary Ann attended her first Tissue Culture Association (TCA) Congress back in 1987, when Martie Wright invited her to present her emerging work on image analysis (applied to in vitro experimenation) as part of a symposium in Washington, D.C. Mary Ann was determined to deliver this talk, her first invited presentation, although she was a full 8.5 months pregnant by the time of the Congress, and had to get a special Doctor's permission just to board the plane. "I found the scientists I met at this meeting to be so completely gracious, receptive, and intellectually curious, that I immediately became a member myself," said Mary Ann. "In all of the years since, I've only missed one TCA/SIVB meeting (while I was on sabbatical leave in New Zealand)."

Mary Ann not only kept on participating since that initial meeting, but has served in multiple leadership roles, most recently as President (2000-2002), where she led the Society through a major overhaul of the Constitution and Bylaws. She's served on the Board of Directors from 1998-present, has been the overall Program Chair, a member of Constitution and Bylaws, and Strategic Long Range Planning Committees, and Vice-Chair of the Plant Section. From 1994-1998, she also took the role of US Correspondent for the International Society for Plant Tissue Culture and Biotechnology, and subsequently was able to spearhead the interaction between SIVB and IAPTC&B towards the 2002 Congress in Orlando.

Mary Ann took her position at University of Illinois just after graduate school in 1984. Since that time, she's received the College of ACES Faculty Award for Research, the Paul A. Funk Scholarship Recognition Award, Amoco Award for Innovation in Undergraduate Teaching, and the Lilly Fellowship. She was awarded a Fulbright Senior Fellow Award for research and teaching in New Zealand in 1999, and was also named a University Scholar. Recently (January 2003) she completed an 18 month term as interim head of her department (Natural Resources and Environmental Sciences), and is thrilled to be released from that (mind-deadening) administrative role, and back to mentoring "...my outstanding, dedicated lab team of students, postdocs, technicians and undergraduate scholars. When we have lab strategy meetings, I have to lean back so that I don't catch fire from all the sparks they are generating. What really makes me happy is that my students have now joined the SIVB, and this is the best place for them to be."

Barbara M. Reed Ph.D.

Barbara M. Reed Ph.D.
USDA

Barbara (Baltensperger) Reed grew up on a farm in rural Nebraska, looking at and enjoying nature. Her parents were very supportive and assisted when possible. "Around our house it was never IF you go to college, but WHEN you go to college" Barbara noted. A big influence towards a science career came in her sophomore year of high school with a visit to the University of Nebraska Medical Center Genetics Laboratory and her first exposure to storing cells in liquid nitrogen. It was an enlightening experience and "really opened my eyes to greater possibilities than I knew of in a small farm town." Barbara's initial career goal was to be a veterinarian and her parents arranged for her to accompany a local veterinarian on his rounds. However, the realities of that choice quickly became evident as Nebraska didn't have a veterinary school and sent only 6 to 8 students to neighboring states for training for large animal practice. So, after a brief look at several non-science majors, an excellent general biology class helped her decide on science education. "The choice turned out to be a good one as it exposed me to all the sciences and gave me a very broad outlook.

The next step was marriage and a move to Oklahoma State University for graduate study in the Department of Botany and Plant Pathology (her husband was already there in the Biochemistry Dept). Being a grad student in a Botany department meant that you learned quickly how to borrow, beg, and make do to get your thesis project done. All the Botany students were TAs as there was little grant money for basic botany. A summer tissue culture course in the biochemistry department began her career in tissue culture. "I went back to the lab after the course, initiated alfalfa callus cultures, and attempted to sterilize nematodes and grow them on the callus to study the cellular effects of the parasitism. It was an interesting experience. Unfortunately the nematodes were full of bacteria and the project never progressed, but it did spark my interest in tissue culture" said Barbara.

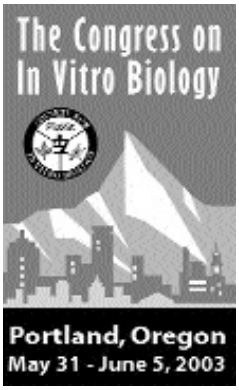
Following graduation she spent a year as a sabbatical replacement for her major professor, Paul Richardson, teaching plant kingdom (morphology), plant anatomy, and microtechnique. "Job hunting for two Ph.D.s meant we would go wherever the prospects for two jobs looked good, so with a firm post doc for my husband and an assistant professor application in for me, we moved to Oregon" said Barbara. "The position I applied for didn't pan out, but I spent the next few years teaching general biology in the General Science Department and plant anatomy and microtechnique in the Botany Department." At that point, she could see that teaching full time was not going to get her into a tenure track position and she would need to get more research experience. She arranged to work in the laboratory of Donald Armstrong doing cytokinin research with *Phaseolus lunatus* (lima bean) callus cultures. This was a good experience and provided the post doc experience that she had missed out on previously. As a result of this experience, she was hired for a post doc that developed into the position she holds today.

The post doc advertisement at the National Clonal Germplasm Repository asked for plant tissue culture and cryobiology experience. "As it turned out I had the best tissue culture background of the applicants, and no one had any cryobiology experience" Barbara noted. "This post doc was a great experience. My supervisor, ARS Research Leader, Harry Lagerstedt, knew nothing about tissue culture or cryobiology, but was very interested in having vegetative plant germplasm preserved in long-term storage. I was given complete freedom to do whatever I needed to do and on my own schedule and Dr. Lagerstedt was very supportive and encouraging. The bad part was that there was no one around to consult! So I taught myself cryobiology by reading the literature, attending Cryobiology meetings, and devising my own protocols from what I summarized from the literature." At the time, there were only a few researchers working on meristem cryopreservation, so there were many avenues open for study. At the end of the post doc, Dr. Lagerstedt retired and Melvin Couey began as Research Leader the following year. He felt that the lab needed a full time scientist to oversee both tissue culture and cryogenics. "The position advertisement asked for qualifications in plant tissue culture and cryobiology, and this time I was well qualified in both areas and was offered the position. At this point (1989), I joined the Tissue Culture Association so that I could keep up on the tissue culture side of my new position. I immediately found it to be a friendly, welcoming society. If you are willing to contribute, this society will welcome and encourage you," Barbara remarked. Barbara has been actively involved in SIVB since that point, first as a committee member and Plant Section Secretary, and then as a Member-at-Large and Secretary of the SIVB Board.

Since joining ARS in 1989, Dr. Reed has been involved in "alternative methods of germplasm storage" in its various aspects of micropropagation, cold storage of in vitro plants, and cryopreservation of apical meristems. The Reed lab was the first to develop successful apical-meristem cryopreservation-storage methods for valuable *Cynodon*, *Humulus*, *Lolium*, *Pyrus*, *Ribes*, *Rubus*, *Vaccinium* and *Zoysia* (meristems), and *Corylus* (embryonic axes). Dr. Reed applied a unique cold acclimation pretreatment to source plants, which doubled survival and increased the level of organized growth of cryopreserved apical meristems. She established the first base cryopreserved collection of meristems for the U.S. National Plant Germplasm System. These methods are now in use for meristem cryopreservation at NCGR, other USDA laboratories, and laboratories in Fiji, France, Germany, Kazakhstan, Malaysia, New Zealand, Poland, Samoa, Scotland, and Spain. Dr. Reed developed an innovative method for cold storage of *in vitro* germplasm based on concepts of cold acclimatization and desiccation stress. She led research by visiting scientist Dr. Patricia Buckley, graduate students, and ARS Apprentices to develop procedures for detecting internal bacterial contaminants of tissue cultures, identifying them, screening for antibiotic susceptibility, and treating infected tissue cultures with antibiotics. These studies produced detailed information on the bacterial contaminants, antibiotic responses, and methods for bacterial elimination from tissue cultures of diverse genotypes of several genera. Additional graduate students have worked on improving basic micropropagation protocols for the diverse germplasm collections at the Repository. Since there are not a lot of scientists working in meristem cryogenics, and her colleagues are all several time zones away, email has become her favorite communication mode (after traveling). "Several of my current projects involve international technology transfer and that is a great way to combine my scientific interests with my love of travel"

Barbara credits several people as instrumental in her career development. "Of course my parents set the stage by raising me to believe I could do anything I wanted. I also greatly appreciate the support and mentoring of my past and present (Dr. Kim Hummer) research leaders" said Barbara. "They all had confidence in me, tried to give me the resources necessary to do the job, and gave me the freedom to do what I needed to do. My husband is always my biggest supporter and often provides a willing a second opinion from a biochemistry point of view. And last but not least is the professional support and friendship I have received from SIVB members."

2003 Congress on In Vitro Biology



The 2003 Congress on In Vitro Biology was held at the DoubleTree Jantzen Beach Hotel, Portland, Oregon from 31 May – 4 June. The Congress focused on a wide range of topics and issues of interest to all Sections (Cellular Toxicology, Invertebrate, Plant, and Vertebrate) of the Society. A total of 382 scientists from 23 countries attended the scientific meeting and interacted with exhibitor representatives. This was the first year SIVB offered free registration to Students and 48 took advantage of this opportunity.

The start of the meeting was signaled by what, hopefully, will be a long-standing tradition – the Student Reception and Poster Session coordinated by the Education Committee. Posters by students from high schools and community colleges, as well as educators, led to discussions with scientists attending the Congress. The Opening Reception was held in the Exhibit Hall and was a positive forum for participants to meet with the exhibitors and posters session presenters.

While sessions started early Sunday morning, with excellent attendance, many Committee meetings had already concluded. I was impressed by the outstanding attendance at various Committee meetings even though they occurred as early as 7:00 AM. Sunday concluded with Plenary Speaker, Dr. Richard Stouffer of the Oregon National Primate Research Center, giving a stimulating, entertaining and highly informative talk on the current status of primate reproductive studies and their implications to humans. Following this talk, which received rave reviews from a highly eclectic audience, we boarded buses to a reception at the truly beautiful and historic Pittock Mansion. Next, over to the Forestry Center for a delightful dinner and walk-through of the exhibit areas.

The Congress Program consisted of 18 Symposia, 3 Roundtable Discussions, 1 Workshop, 6 Contributed Paper sessions, and 5 Interactive Poster sessions. In all, 212 abstracts were received, of which 82 were presented as posters. The breadth of excellent science at these sessions was as good, and in my opinion better than, previous SIVB meetings. While acknowledging the uniqueness of problems studied across the various Sections of the Society, many of the session themes crossed all disciplines. It is not surprising that Biotechnology was a theme in more than a third of the sessions, ranging from improvement of forests and grapevines and delivery of genes to insect, plant and mammalian cells, to creation of pest resistance and biocontrol systems. Stem cell utility in cancer treatment, reproduction, biocontrol, and toxicology highlighted the immense steps being made in this arena. Growth factors and in vitro techniques were the foci of several sessions in both plant and animal session with an extended Invertebrate Symposium consisting of 6 Invited Speakers. Three corporate sponsors got together to arrange and provide speakers for a Roundtable Discussion on the future of serum in animal cell propagation. Even the unfortunate impact of chemical and biological terrorism in our world today was addressed by two symposia; one in the Plant sessions and one in the Animal sessions, in which new models for studying mechanisms of action and therapeutic approaches to these threats were discussed.

The SIVB is deeply indebted to a large list of individuals who put this program together and carried it out flawlessly. These individuals include: conveners, fund-raisers and corporate sponsors, solicitors, presenters, moderators, exhibitors and schedulers. The Congress program planning began with Committee Chairs from each of the Sections, but was brought to fruition by many other hard-working, diligent members of SIVB. And something that cannot be overlooked, the office staff of SIVB that pulled the Congress and programs, meeting facilities, banquet and tours all together into a positive experience for all that attended. My thanks to all for making this meeting a great success.

As Program Chair, I waited all year to enjoy the social events that have become a trademark of SIVB meetings. Thanks to the Board meeting, I missed the Scotts Company tour on Saturday, but am sure everyone had a very good trip. I already mentioned the Plenary Reception and Dinner, which I did attend and enjoyed tremendously. On Tuesday, I was called back to my Institute and missed both the closing banquet and the winery tour at Greyhorse Vineyards. I've heard from many that the banquet was outstanding. Some of our Invited Speakers called specifically to mention the superb time they had throughout the meeting and to let me know that SIVB knows how to celebrate.

If you need more specifics or want to comment on any aspect of the Congress please contact me at william.smith@apg.amedd.army.mil. I look forward to seeing you all in San Francisco for the World Congress in 2004.

William J. Smith

2003 Congress Supporters

The Planning Committee acknowledges the contributions and donations received from the following companies and organizations for their support of scientific and educational programs.

Congress Laureate Supporter
US Army Medical Research and Materiel Command

Congress Supporter
Monsanto Company
UST, Inc.

Congress Symposia Supporters
BASF Plant Science LLC
Bayer CropScience
GIBCO Invitrogen
Renessen LLC
RiceTec, Inc.
Syngenta, Inc.
USDA
Verdia, Inc.
Weyerhaeuser

Congress Contributing Supporters
BD Biosciences Discovery Labware
CA Dept. of Education, SSPG
Caisson Laboratories
GlaxoSmithKline
Long Island Group Advancing Science Education (LIGASE)
MatTek Corporation
Promega Corporation
PhytoTechnology Laboratories
The Scotts Company
ArborGen LLC

2003 SIVB Student Awards

The following student awards were presented at the 2003 Congress on In Vitro Biology, Portland, Oregon. Information related to the available specific student awards can be found on the SIVB Website (www.sivb.org) or by contacting the SIVB Business Office at (301) 324-5054, sivb@sivb.org, or Dr. Gertrude Buerhing, Chair, Student Affairs & Awards, (510) 642-3870, buehring@uclink4.berkeley.edu.

Li Chen

2003 JOHN S. SONG AWARD

Transformation and Regeneration of Wetland Monocot *Juncus Accuminatus* Using Different Binary Vectors

Our long-term goal is to express viral genes in wetland monocots whose gene products can be used as vaccines against infectious agents, such as the avian-transmitted West Nile Virus. The objective of the study presented here is to develop a protocol for establishing a model transformation system for the monocot *Juncus accuminatus* using different binary vectors residing in *Agrobacterium tumefaciens*. Three binary vectors, pTOK233 in *Agrobacterium* strain LBA4404, and both pCAMBIA-1201 and pCAMBIA-1301 in EHA105, were used to transform *J. accuminatus.* All vectors contained *uidA* and *hptII* genes within their T-DNA region. Seedling-derived calli were used as explants. Transformed calli were selected on MS media containing 40 or 80 mg/l hygromycin, regenerated and rooted on MS medium containing 5 mg/l of 6-benzylamino-purine BA) and 0.1 mg/l of alpha-naphthaleneacetic acid (NAA), respectively. To date 20 lines of transformed plants have been selected and established in the greenhouse. Both transient and stable expression of the *uidA* gene was demonstrated by histochemical GUS assay in calli and in the plants. All parts of the transgenic plants show GUS activity to different degrees, depending on the plant line. Two plants from each line and 4 lines from each plasmid were analyzed for the presence of the reporter and marker genes. The presence of the *uidA* and *hptII* genes in transformants was confirmed by polymerase chain reaction (PCR). To our knowledge this is the first report on *J. accuminatus* transformation using binary vectors residing in *Agrobacterium*,and plant establishment in the greenhouse. In conclusion, the wetland monocot *J. accuminatus* appears transformable with *Agrobacterium tumefaciens.*

Li Chen. Bioscience Department, Salem International University, Salem, WV 26426. E-mail: rogers@salemiu.edu. *In Vitro Cellular and Developmental Biology 39:21-A, 2003.*

Salih S. Kocer

CELLULAR TOXICOLOGY AWARD

Metalloprotease Inhibitors, Non-microbial Chemically Modified Tetracyclines and Ilomastat, Block Anthrax Lethal Factor Activity In Vitro

Anthrax lethal toxin, produced by the bacterium *Bacillus anthracis*, is the major cause of death in animals infected with anthrax. One component of this toxin, lethal factor (LF) is a zinc metalloproteinase, which proteolytically cleaves members of the mitogen activated protein kinase kinase MAPKK or MEK) family through proteolysis of their NH2-termini. Although the relationship between MEK cleavage and the pathology of anthrax remains correlative, it appears that the proteolytic activity of LF is responsible for the activation of macrophages at lower doses and for macrophage cytotoxicity at higher doses. We showed that zinc metalloproteinase inhibitors CMT-3, CMT-308 and Ilomastat inhibit LF-mediated cleavage of the N-terminal domain of MEKs, using lysates of human monocyte cell line (MonoMac-6) as sources of the MAPKKs, separation by SDS-PAGE, and detection by Western Blotting. Clinical trials of the CMTs and Ilomastat on human patients have already been initiated. Here we show that we could combat effects of the lethal toxin of *Bacillus anthracis in vitro*, based on the anti-proteolytic activity actions of CMTs and Ilomastat.

Salih S. Kocer. State University of New York at Stony Brook, Program in Cellular and Molecular Biology, Life Sciences Building, Room 350, Nicolls Road, Stony Brook, NY 11794-5215. Email: sskocer@yahoo.com. *In Vitro Cellular and Developmental Biology 39:58-A, 2003.*

Sadanand Dhekney

STUDENT TRAVEL AWARD

Cryopreservation Studies in *Carica papaya* - Effect of Some Cryoprotectants on Regrowth and Somatic Embryogenesis in Sunrise Sola papaya

Cryopreservation is an efficient technique for long term storage of Embryogenic cultures, and as such can be utilized to back-up plant genetic resources and for storing materials for somatic cell genetic studies. Transformation of papaya involves the use of embryogenic cultures, and cryopreservation provides an ideal means for long term storage of materials for transformation. Therefore, a cryopreservation protocol was developed for papaya to ensure a continuous supply of certain embryogenic lines. The response of Embryogenic papaya cultures to different cryoprotectant treatments was determined following their recovery and regrowth after storage in liquid nitrogen (LN). Cultures were induced from hypocotyls of greenhouse-grown papaya seedlings. Four different cryoprotectant combinations were tested: 1) glycerol + DMSO (5% each); 2) glycerol + DMSO (10% each); 3) polyethyleneglycol (10%) + glucose (10%) + DMSO (10%); and 4) Plant Vitrification Solution 2 [glycerol 30%) + ethylene glycol (15%) + DMSO (15%)]. Embryogenic cultures 200mg) were incubated briefly in cryoprotectant in 1.5 ml cryo-vials. The cryo-vials were cooled -80° C using a Mr. Frosty (1° C min-1), and then plunged into LN while the cultures treated with PVS-2 were directly plunged into LN. Viability and regrowth of cultures were recorded following storage in LN for 48 h. Cryoprotectant glycerol + DMSO (10% each) resulted in the highest rate of survival immediately after thawing (100%) followed by the vitrification treatment (75%). Two months after recovery from LN, the vitrification treatment (4) resulted in the maximum viability followed by treatment (3). Somatic embryo development occurred on induction medium before transfer to maturation medium and occurred earliest in the vitrification treatment.

Sadanand Dhekney, University of Florida, Tropical Research and Education Center, Horticultural Sciences, 18905 SW 280th St., Homestead, FL 33031. *In Vitro Cellular and Developmental Biology, 39:54-A, 2003*

Hyun-Kyung Kim

WILTON R. EARLE AWARD and STUDENT TRAVEL AWARD

Alleviation of Wheat Allergenicity Using the Thioredoxin System

Wheat is one of the most important cereal crops for human food with annual production of over 500 million metric tons. It is also one of the major sources of food allergens, especially in developed countries like the U.S. It is estimated that approximately 15% of children under the age of three and 2% of adults suffer from food allergies. For unknown reasons, the number of individuals plagued by this problem has been on the increase. Thioredoxin is a ubiquitous 12 kDa protein and contains a highly conserved catalytically active site, Cys-Gly-Pro-Cys, which reduces disulfide bonds of target proteins. Intramolecular disulfide bonds are the major components of many principal food allergens, which confer stability to proteins and protect against proteinases. It was shown that some food allergens, such as those in milk and wheat, are successfully reduced by thioredoxin *in vitro* and this reduction resulted in lowered allergenicity of a number of different preparations, including commercial wheat allergen extracts. Reduction of gliadins and glutenins by thioredoxin *in vitro* resulted in decreased allergenic responses in a canine allergenicity model that closely mimics humans. To determine the effect of thioredoxin on the mitigation of allergenicity in wheat grains *in vivo*, a commercially important bread wheat cultivar, Yecora Rojo, was transformed using a highly regenerable green tissue system. Three independent transgenic lines were generated: one line overexpressing wheat thioredoxin *h* and two lines overexpressing barley thioredoxin *h*. Thioredoxin *h* was expressed 10- to 20- times more highly in the endosperm of the transgenic wheat grains relative to controls. Allergenicity of the transgenic grain was tested in the canine model system and the results are consistent with decrease in allergenicity as suggested by *in vitro* studies.

Hyun-Kyung Kim, University of California - Berkeley, Plant & Microbial Biology, 111 Koshland Hall, Berkeley, CA 94720. Email: hyunkkim@nature.Berkeley.EDU. *In Vitro Cellular and Developmental Biology, 39:54-A, 2003*

EDUCATION COMMITTEE UPDATES

The SIVB Education Committee is interested in highlighting workshops, outreach programs, other workshops or meetings of interest. Please email me with your information: carolstiff@kitchenculturekit.com

At the 2003 SIVB Meeting:

CREATING CONNECTIONS BETWEEN SCIENTISTS AND EDUCATORS: BRINGING BIOTECH TO THE CLASSROOM

Convener: Carol M. Stiff, Kitchen Culture Kits, Inc.

Incredible advances are being made in the fields of plant, vertebrate, and invertebrate in vitro biology and it is essential that this information gets to the classroom. This serves to both educate the public and foster development of future scientists and educators. The session discussed various ways this has been and can be accomplished, as well as provided web resources for continued networking. The websites discussed during the sessions will be available at: www.kitchenculturekit.com.

PLANS FOR 2004 SIVB MEETING:

Several potential professional development workshops have been suggested for next year's meeting. These include: Grant Writing Refresher, Bioreactors - A Hands-on Experience, and Commercially Available Models for Pharmaceutical and Toxicological Testing. Anyone who would like to be involved, can suggest others who would be interested in participating, or have suggestions other workshops that you would be interested in attending, please contact the Education Committee: Liz Roemer (Chair) at eroemer@notes.cc.sunysb.edu or Carol Stiff at kck@turbonet.com.

Continued from Cover

loyal" member of the SIVB scientific community and not just a yearly statistic based on a vacation with free beer and social functions? As meeting funds continue to diminish, is it time to look at the very roots of the Society that was based on smaller and more focused meetings? The Society with brand recognition based on small and very focused meetings where colleagues could discuss and present information in their field of in vitro biology.

As the profession of tissue cultures changes with advances in technology, it might be time to consider that the specific Sections and program structure of the SIVB will have to change. Can the Society evolve a brand image that will allow the *in vitro* disciplines to be distinct, but where the SIVB serves as a hub for effective communication? I do not have the answers, but these are certainly question we need to be ask if the SIVB is to maintain a viable and cost effective scientific society.

Sandra L. Schneider, DrPH
SIVB President

The workshops below are not part of the SIVB's Education Committee Programs but should be worth noting:

Teacher Training Workshops

INTRODUCING PLANT TISSUE CULTURE IN THE CLASSROOM

July 28 - 31, 2003
Dr. Michael Kane MKane@MAIL.IFAS.UFL.EDU
Environmental Horticulture Department
University of Florida, Gainesville, Florida

The overall objective of the workshop is to provide instructional resources, conceptual background information and hands-on laboratory experiences to facilitate the incorporation of plant tissue culture (micropropagation) into classroom curricula in the most cost efficient manner.

BIO21: TEACHING BIOLOGY WITH BIOINFORMATICS

October 17-18th,
Raleigh, North Carolina
http://www.geospiza.com/outreach/bio21/index.html

As the need to work with large quantities of data grows, it is imperative that biologists become better data analysts, learn to define new experimental requirements, and become more critical consumers of software and bioinformatics tools. Encouraging biology faculty to incorporate bioinformatics experiments in all biology courses and to begin a dialog about what bioinformatics really is and how it should be included in, the undergraduate biology curriculum can bridge the technology gap.

Student Training Workshops

PROJECT SMART: SCIENCE AND MATHEMATICS ACHIEVEMENT THROUGH RESEARCH TRAINING

June 23 - July 18
University of New Hampshire
Coordinator: Subhash C. Minocha Tel: 603-862-3840
See: http://www.smart.unh.edu/

The Summer Institute for high school students dealt with the relevant techniques of biotechnology and genetic engineering as well as the social, environmental, and ethical issues raised by recent developments in the field, with historical and philosophical perspectives for understanding these issues.

STUDENT TRAINING DVD:

Plant Tissue Culture for the Classroom and Home: An Introduction for the Hobbyist, Student, Teacher, Nurseryman has been released and is intended to aid teachers and students in beginning plant tissue culture projects. It was created by Dr. Carol Stiff and filmed in the labs of the University of Florida and Kitchen Culture Kits: cstiff@austincc.edu.

2003 Student Science and Engineering Fair Award Winners

Listed below are the High School Science and Engineering Fair winners who received SIVB certificates and letters of recognition for projects related to the areas of in vitro biology.

Sergei Chavez, Colegio Ceintifico Albert Einstein, Peru
Maria Jose Huamani, Colegio Ceintifico Albert Einstein, Peru
Nisha Shah, Lecanto High School, Lecanto, FL
Michele T. Torsiglieri, Monroe, GA
Julie Clift, Satellite High School, Satellite Beach, FL
Alexey Belih, Gymnasium N3, Belgorod, RUSSIA
Kristin Alligood, Pedro Menedez High School, St. Augustine, FL
Safiah Afity, Panama City Advanced School, Panama City, FL
Daylen K. Koga, James B. Castle High School, Kaneohe, HI
Jessica Pearl Schwartz, Thomas Jefferson Sr. High School, Plymouth, MN
Courtney Rumala, Hernando Christian Academy, Brookside, FL
Elizabeth Heroux, St. Johns Preparatory School, Collegeville, MN
Jennifer Nell Becnel, St. James High School, St. James LA
Colter King, Greybull High School, Greybull, WY
Colby Hyner, Wilcox-Hidreth Public School, Wilcox, NE
Miranda Stevens, Fort White High School, Fort White, FL
Emery Lin, Gainesville High School, Gainesville, FL
Brian Waters, Stoneman Douglas High School , Parkland, FL
Eric Benson, Gibbon-Fairfax Winthrop High School, Winthrop, MN
Colin Hannigan, St. Hubert's School, Chanhassen, MN
Erin Josephson, Minneota Public School, Minneota, MN
Gwen Bitker, Westbrook Walnut Grove Middle School, Walnut Grove, MN
Elyse Fuentes, St. Joseph's Catholic School, Ogden, UT
Susan Paskey, St. Joseph's Catholic School, Ogden, UT
Tomas Bush, Catholic High School, Baton Rouge, LA
Christine Vaughn, Music Mountain Junior/Senior High School, Peach Springs, AZ
Kimberly Duwyenie, Music Mountain Junior/Senior High School, Peach Springs, AZ
Ramon Gomez Moreno, Thomas Alva Edison School, Del Rey Caguas, PR
Kayla Zimmerman, Hotckiss High School, Hotchkiss, CO
Katy Andry, Paoli Junior-Senior High School, Paoli, IN
Christopher Camilleri, Rochester Lourdes High School, Rochester, MN
Sarah Kezar, The Altamont School, Birmingham, AL
D'Anthony Allen, Jefferson County International Baccalaureate, Birmingham, AL
J. Cotter King, Greybull High School, Greybull, WY
James W. Denny, Robert Louis Stevenson Upper School, Pebble Beach, CA
Mark Cross, South River High, Edgewater, MD
Christina Damman, Wamego High School, Wamego, KS
Gavrilenko Olga, Gymnasium No .2, Sarov, St. Dukhova RUSSIA
Justin Tan, Selwyn House School, Westmont, Quebec Canada
Abby Clyde, Beach High SchoolBeach, ND
Camille Erickson, Perham High School, Perham, MN
Emily Stoll, Perham High School, Perham, MN
Ashley Wilbur, Howard School of Academics & Technology, Chattanooga, TN
Miranda Boggs, Bartsville High School, Bartsville, OK
Sarah E. Smith, Bishop Feehan High School, Attleboro, MA
Ramon Gomez Marceno, Colegie Tomas Alva Edison, Caguas, PR
Stacey Gorski, Sunnyside High School, Sunnyside, WA
Sarah Bentley, Yorktown High School, Arlington, VA
Rachael Collier, Mediapolis, Mediapolis, IA
Federico De Puy, St. Louis High School, Lake Charles, LA
Gregory Amend, Manhasset High School, Manhasset, NY
Kelly Mrachek, Alexander Public School, Alexander, ND
Colleen Purcell, Covent of the Sacred Heart, Greenwich, CT
Christine Persampier, Brewster High School/Science Horizons, Brewster, NY
Tasnim Imran, Mast Academy, Miami, FL
Annette Trierweiler, Park Tudor School, Indianapolis, IN
Cierra Simpson, Spotswood High School, Harrisonburg, VA
Xavier A. Figueroa Rasado, Ramon Power y Giralt, Las Piedras, PR
Ethan Kottke, Farmington High School, Farmington, NM
Christina M. Farley, McCorristin High School, Hamilton, NJ
Chris Yard, Winona Senior High School, Winona, MN
Ashley Huber, Lemmon High School, Lemmon, SD
Daniel Galtieri, Danbury High School, Danbury, CT
Melissa Barber, Dekalb High School, Waterloo, IN
Jeremiah Cox, Willowcreek Middle School, Portage, IN
Kelley Brendle, Latta High School, Ada, OK
Kristen Reynolds, Central High School, St. Joseph, MO
Ashley Woodrow, Miami Trace High School, Washington Court House, OH
Laura March, Onsted High, Onsted, MI
Tasnuva Kaochar, Catalina Foothills High School, Tucson, AZ
Lisa Hoffman, Elko High School, Elko, NV
Brittany Wallin, St Mary Academy – Bayview, Riverside, RI
Brandon Fimple, Vinita High School, Vinita, OK
Brittany Satterly, Potomac Senior High School, Dumfries, VA
Brianna J. Gillund, North Toole County High School, Sunburst, MT
Mercedes Elder, McDonald County High School, Anderson, MO
Reid Merryman, Marian High School, Mishawaka, IN
Marcia Rutter, Patrick Henry High School, Hamler, OH
Stephanie Kelly, Nicolet High School Glendale, WI
Brian Fisher, Mandan High School, Mandan, ND
Alexandria Scarbrough, Lausanne Collegiate School, Memphis, TN
Katy Tait, Lausanne Collegiate School, Memphis, TN
Christopher Polley, Desoto High School, De Soto, MO
Amanda Verma, Little Rock Central, Little Rock, AR
Amanda Kresge, West Perry High School, Pittsburgh, PA
James Haught, Del Norte High School, Del Norte, CO
Cole Young, Carter Co. High School, Ekalaka, MT
Jon Cline Carter Co. High School, Ekalaka, MT
Timothy D. Chavez, St. Pius IV High School, Albquerque, NM
Sarah Brown, John F. Kennedy High School, Bellmore, NY
Erin Peterson, Adair – Casey High School, Adair, IA
Britney Crawford, Ipswich School, Ipswich, SD
Mary Gray, LaPlata High School, LaPlata, MD
Jenna Walters, Delavan High School, Delavan, IL
Eric Liss, Sarasota High School, Sarasota, FL
Samatha Schmidt, Hawthorne Scholastic Academy, Chicago, IL
Tanner Meek, Latta High School, Ada, OK
Megan Stocker, Newcomerstown High School, Newcomerstown, PH
Ewa Szymansak, T.R. Proctor High School, Utica, NY
Eric Liss, Sarasota High School, Sarasota, FL
Jacob Donaldson, Laurel Ridge Academy, Medford, NJ
Lascelles Lyn-Cook Jr., Hall High School, Little Rock, AR
Ronak Kedia, Benjamin Franklin High School, New Orleans, LA
Ashlee Quilter, Bountiful High School, Bountiful, UT
Aprille Hvinden, Maddock Public School, Maddock, ND
Sarah Wifahrt, Park City High School, Park City, UT
Eva Velarde, A.J. Diamond High School, Anchorage, AK
David Meigooni, Paul Laurence Dunbar High School, Lexington, KY
Soumo De, St Andrew's Episcopal School, Ridgeland, MS
Janani Sundar, Godwin High School, Richmond, VA
Marvin Liang, Plano Senior High School, Plano, TX
Lien Bang, Garland High School, Garland, TX
Kyle Bowman, Conestoga Valley High School, Lancaster, PA
Jodi Neugebauer, Eaton School, Ethan, SD
Mary Gardner, Spaulding High School, Athens, GA
Mitchell Ledbetter, Annie Comp Jr. High School, Jonesboro, AR
Michele Dufalla, Mount de Chantal, Wheeling, WV
Chelsey L. Villanueva, Kapolei High School, Kapolei, HI
Daria Zajac, F. J. Brennan Catholic High School, Windsor, Ontario, CANADA
Emilia Kolanska,F J Brennan Catholic High School, CANADA
Ryanne Dennis, The Ingenuity Project, Baltimore, MD
Shantanu Gaur, Bethel Park High School, Bethel Park, PA
Briana Carp, Oregon Episcopal School, Portland, OR
Xiameng Sun, Wharton High School, Tampa, FL
Mitchell Ledbetter, Annie Camp Jr. High School, Jonesboro, AR
Stephen Li, Clear Brook High School, Friendswood, TX
Janna Tomsheck, No. Toole County High School, So. Sunburst, MT
Diane Gumina, Merino Jr./Sr. High School, Merino, CO
Nathan Hatridge, Memorial High School, Victoria, TX
Adriann Mintzymer, Fayetteville – Manlius High School, Manlius, NY
Michael Wisniewski, Westfield High School, Centreville, VA
Latia N. Wells, Ferguson, Catholic Academy, Detroit, MI
Varun K.Shekhar, Northville Senior High, Northville, MI
Catherine G. Fontana, Divine Child High School, Dearborn, MI
Winston Harmon Messer, Presbyterian Christian School, Hattiesburg, MS
Jennifer Babbs, Taylorville High School, Taylorville, IL
Melinda Armitago, Cornerstone Christian School, San Angelo, TX
Candice Fletcher, The Ingenuity Project, Baltimore, MD
Sarah E. Gutman, Mount de Chantal Visitation Academy, Wheeling, WV
Estevan Martienz, United High School, Laredo, TX
Joshua Levine, Ramaz Upper School, New York, NY
David Meigooni, Paul Laurence Dunbar High School, Lexington, KY
Sarah Megan Roberts, Westview High School, Martin, TN
Brittany Harrington, Astronaut High School, Titusville, FL
Brent Goodman, Lafayette Jefferson High SchoolLafayette, IN
Jarryd Levine, Paul D. Schriber High School, Port Washington, NY
Kristin Young, Spring Valley High School, Columbia, SC
Julian Hong, Ronald Regan High School, San Antonio, TX
Danna Quinibi, Health Careers High School, San Antonio, TX
Eric B. Chang, Thomas S. Wootton High School, Rockville, MD
Jud Kilbourn, Desert Mountain High School, Scottsdale, AZ
Stacy Madison, Tse Bit Ai Middle School, Shiprock, NM
Sarah Fayad, Piedra Vista High School, Farmington, NM
Alexey Belih, Gymnasium N3, Belgorod, RUSSIA
Soumo De, St. Andrew's Episcopal School, Rigeland, MS
Lauren Ciminello, Poughkeepsie High School, Poughkeepsie, NY
Lydia The, Horace Mann School, Riverdale, NY
Levent Tuysuzoglu, Academy of Science and Technology, Hackensack, NJ
Margarita Echavarria, American Senior High, Hialeah, FL
Amanda Russo, Fox Lane High School, Bedford, NY

Invertebrate News

The Invertebrate Section of the SIVB organized and held very informative sessions at the annual meeting. They included a high quality symposium on "Growth Factors" featuring excellent speakers on immunolocalization of growth factors and receptors in co-cultures of fibroblasts and trypanosomes, Limnea neurosciences, Uca crab ecdysone receptors, C. elegens RNAi. Additionally, Interactive Posters were presented on Bt cellular actions and midgut stem cells proliferation and differentiation.

On Monday, June 2, the Invertebrate Section Meeting was held at the Stuart Anderson Black Angus Restaurant in Washington State. Dr. Marcia J. Loeb was celebrated and honored by her friends and colleagues by being the first recipient of the "Invertebrate Fellow Award". Criteria for the award includes membership in the Society for In Vitro Biology for a minimum of 10 years and a solid research career in the field of in vitro biology. She was nominated by her long time friend and collaborator Dr. Raziel S. Hakim. The award recognizes Marcia's long and significant contribution to the Society and to the science of Invertebrates especially her strong commitment and new insights in our understanding of the insect midgut development. Along with a lovely engraved plaque, Dr. Cindy Goodman presented Marcia with a few gifts (butterfly plate, garden lantern, and lady bug magnet) from all of us present at the meeting. The occasion was one of mixed emotions, as Marcia announced her retirement effective early July 2003. Marcia will be missed by her many friends, colleagues, collaborators, and the Society. All wish her a long, safe, and healthy retirement.

Nominations for the 2004 recipient of the "Invertebrate Fellow Award" are now being solicited. Any member of the Invertebrate Section can nominate someone by referring the name to Dr. Cindy Goodman.

Along with Dr. Marcia Loeb, Dr. Cynthia Goodman and Mr. Guido Caputo were honored for their excellent service to the Invertebrate Section, specifically as a Member of the SIVB Board of Directors and as the Invertebrate Section Secretary, respectively.

Fueled by a delicious dinner of mouth-watering steaks and ribs, along with mountains of chocolate desserts, we discussed and agreed to a tentative program for the 2004 World Congress on In Vitro Biology in San Francisco, May 22-26, 2004. Included is a special symposium proposed by Drs. Robert Granados and Karl Maramorosch. This symposium is to be a tribute to Drs. Thomas Grace and Zan-Yin Gaw. It will include noted national and international speakers. Together with this special tribute, we would like to focus on two additional invertebrate sessions involving neurosciences and cell signal transduction pathways.

The 2004 program will also be spiced up with joint symposia involving the Vertebrate, Toxicology, and Plant Sections that may include "Use of Animal Cells for Screening Ecotoxicants", "Stem Cells", and "RNAi". In addition, we would like to organize a "Microscopy Workshop" involving the novel techniques for cell culture research. All this should cover topics that are of international interest for fundamental and applied research. Our challenge for and commitment to our section is to have these important symposia next year; your help is very much welcome and solicited. The program committee is open to any suggestions you may have as to topics and areas of interest.

For 2004, a new slate of SIVB officers is to be elected. Dr. Guy Smagghe has been nominated for President of the Invertebrate Section. He is professor in insect physiology in Belgium, SIVB member since 1998, convened in 2001 a successful symposium on the use of insect cells to study insect hormones and screen for novel insecticide actions, and served as Vice President since 2001. Guido Caputo who has been nominated as Invertebrate Section Secretary is an Insect Tissue Culture Biologist with Natural Resources Canada, Canadian Forest Services at the Great Lakes Forestry Centre in Sault Ste. Marie, ON, Canada. He is involved in the isolation, development, and maintenance of continuous insect cell lines and cell culturing systems for studying and developing effective, environmentally acceptable, and economically viable insect control agents such as insect pathogenic viruses. Nominations for Invertebrate Section Vice President are presently needed.

At the Closing Banquet on Wednesday evening, our current Section President, Dr. Amy Wang, and Dr. Cindy Goodman received awards from the SIVB. And as extra surprise and honor, Dr. Marcia Loeb was given the "SIVB Presidential Award" by the SIVB President, Dr. Sandra Schneider, for her rich career in insect cell research.

Finally, our Invertebrate Section wants to encourage young scientists and PhD students to actively participate at the SIVB meetings.

Guy Smagghe

Nominations for 2004 – 2006 SIVB Officers

The Nominating Committee is actively seeking member input for potential candidates for the following positions, slated for election for fall 2003 ballot:

Board of Director Officers:

President-Elect
Vice-President
Secretary
Treasurer
Members-at-Large

Other Elected Committee Chairs:

Awards
Education
Lab Materials & BioSafety
Consitution & ByLaws

Please contact the Nominating Committee Chair, Mary Ann Lila (imagemal@uiuc.edu or 217-333-5154) to voice your support for candidates for any of these open slots, or to discuss any suggestions/concerns about the balloting and election timing and process.

Member News

◗ Mike Horn, Group Leader-Corn Transformation & Lab Services and SIV/HIV Edible Vaccine Project Leader at ProdiGene, has received a one-year Phase I SBIR (Small Business Innovative Research) grant entitled "Development of a Plant-based Vaccine against HIV". This is the second NIH grant ProdiGene has received for edible HIV vaccine research.

◗ Dr. Sandhya Gupta, Scientist (Senior Scale) in the Tissue Culture and Cryopreservation Unit, National Bureau of Plant Genetic Resources (NBPGR), New Delhi, India will spend one year in the laboratory of Dr. Barbara M. Reed, USDA-ARS, Corvallis OR. Dr. Gupta has received a Biotechnology Overseas Associateship from the Government of India, Ministry of Science & Technology, Department of Biotechnology. Dr. Gupta is involved in projects related to "In vitro conservation and cryopreservation of temperate and minor/underutilized fruit germplasm". She will work with Fragaria and Rubus germplasm at the National Clonal Germplasm Repository in Corvallis.

◗ *From C.S. Prakash and as highlighted in AgBioWorld:*

The National Academy of Sciences announced the election of 72 new members and 18 foreign associates, six of whom are plant scientists, most of them working in biotechnology. The list includes:

Luis Herrera-Estrella, National Polytechnic Institute, Mexico - among the first to develop a GM plant Tony Cashmore, University of Penn. - made fundamental contributions to plant molecular biology June Nararallah, Cornell University - self-incompatibility studies Mike Thomashow, Michigan State University - pioneered the development of cold-tolerant GM plants James Tiedje, Michigan State University - microbial ecologist James van Etten, University of Nebraska - plant pathologist.

The Academy's recognition of these excellent plant scientists is an honor for them and our profession.

◗ *Also, from C.S. Prakash:*

On May 13, 2003, the U.S. and Cooperating Countries Filed a World Trade Organization case against the European Union for its illegal moratorium on biotech foods and crops. U.S. Trade Representative Robert B. Zoellick and Agriculture Secretary Ann M. Veneman announced the action being taken by the United States in conjunction with Argentina, Canada, and Egypt. Joining Zoellick and Veneman at the Washington D.C. announcement were Dr. C.S. Prakash, who is the organizer of a pro-agricultural biotech declaration signed by 20 Nobel Laureates and over 3,200 scientists; T.J. Buthelezi, a small farmer of biotech crops from South Africa; Dr. Diran Makinde, DVM, Ph.D., Dean of the School of Agriculture, University of Venda for Science and Technology, South Africa; Dr. Ariel Alvarez-Morales, Principal Scientist, Department of Plant Genetic Engineering, Center for Research and Advanced Studies, Irapuato, Mexico; and, representatives from countries participating in the case.

Mr. Zoellick and Ms. Veneman each had statements regarding the EU's long-standing resistance to abiding by the WTO trade rules when in regards to biotech food crops. Ms. Veneman added "The EU actions threaten to deny the full development of a technology that holds enormous potential benefits to both producers and consumers worldwide, while also providing a very significant means to combat hunger and malnutrition that afflict hundreds of millions of people across the developing world."

Dr. Prakash has spent much of the last several years speaking out on behalf of biotech food crops and the impact they could have in feeding the impoverished areas of the world.

◗ *Melissa Hinga and husband Tom became proud parents of Kristen Michele Hinga on June 11. She weighed 7 lbs 3 oz and was 20 inches tall. Melissa says "We are all doing well, getting lots of rest (NOT!) and lots of help from the older girls, Allie and Erin. I will return to RiceTec in early September after spending a few months at home with my family."*

Melissa Hinga

Classifieds

Department Head - Department of Plant and Soil Sciences

Applications and nominations are invited for the position of Department Head of Plant and Soil Sciences, a department with a land-grant mission of teaching, research, and extension. The Head reports to the Dean of the College of Agriculture and Life Sciences; the Director of the Mississippi Agricultural and Forestry Experiment Station; and the Director of the Mississippi State University Extension Service. Mississippi State University is currently ranked fifth by the National Science Foundation in total expenditures in agricultural research. Applicants must have a doctorate in Agronomy, Horticulture, Soil Science, Weed Science, or a closely related field and qualify for appointment at the rank of professor. Demonstrated scholarship and experience in teaching, research and/or extension work are preferred. Applicants should provide evidence of leadership ability in program development, budgetary and personnel management, obtaining outside financial support, and interfacing with clientele groups. Interested persons should send a letter of application including qualifications and administrative philosophy, resume, transcripts for all college course work, and, name/address (including e-mail) of 3-5 references to: Dr. Jerry Gilbert, Chair, Search Committee for Dept Head of Plant and Soil Sciences, Dept of Ag and Bio Engineerin, Box 9632, MS State, MS 39762
jgilbert@abe.msstate.edu, 662-325-3280
The Search Committee will begin reviewing applications on October 1, 2003, and continue until a suitable candidate is identified. More information about the position can be found at http://www.msstate.edu/ dept/PSS/public_html/pspage.html Mississippi State University is an EEO/AAEmployer.

Research Associate - Nanomaterials Toxicology/BioEffects

GEO-CENTERS, INC., an R & D firm specializing in scientific and engineering services for the Department of Defense is seeking a Research Associate to support our operations in Dayton, Ohio. Post-doctoral research associate to perform studies for a new program in a U.S. government toxicology laboratory that investigates the biological interaction of nanomaterials in mammalian cell culture systems. Initial research will involve culture models originating from organs of higher exposure risk. Successful research will progress to in vivo systems including efforts for assessment of organ-specific bioeffects & toxicological absorption, distribution & elimination. PhD in biological sciences with an interest in toxicology. Must have experience in culturing primary mammalian cells or cell lines & performing biochemical analysis of cell samples. The ability to work independently in a small collaborative group setting is essential. Effective computer, writing & verbal skills, required. Must be a U.S. citizen or permanent resident at the time of employment. Preferred skills include research with particulate materials (metal/nonmetal), confocal microscopy, molecular biology (gene/protein analysis), and/or cell signaling analysis. Other relevant skills include electron microscopy, flow cytometry & knowledge of in vivo toxicology. Resume/CV in word format w/ salary requirement & VISAto staffing@geo-centers.com. EOE/AAEmployer. M/F/H/V

Scholarships and Stipends, MS Graduate Program

Salem International University, Salem, WV
Scholarship and stipends are available in the Department of Bioscience, Salem International University, Salem WV for the MS Graduate Program in Molecular Biology and Biotechnology. One position is available to work on the genetic transformation of wetland monocots with novel genes with activity against specific metals and to develop a plant model for the study of metal remediation. A second position is avilable to develop suitable plant models expressing foreign genes for the production of immunotheraputics for human/animal use. Interested individuals should submit official transcripts, cv and three letters of reference to: Dr. S Rogers, Associate Professor, Department of Bioscience, Salem International University, Salem, WV 26426-0500, Telephone 304-782-5585 , FAX 304-782-5579
Make e-mail inquiries to Rogers@Salemiu.edu EOE/AA

Journal Highlights

D. James Morré and Dorothy M. Morré

NADH oxidase activity of Soybean Plasma Membrane

The hormone-stimulated and growth-related cell surface hydroquinone (NADH) oxidase activity of etiolated hypocotyls of soybeans oscillates with a period of about 24 min or 60 times per 24-h day. Plasma membranes of soybean hypocotyls contain two such NADH oxidase activities that have been resolved by purification on concanavalin A columns. One in the apparent molecular weight range of 14 to 17 kD is stimulated by the auxin herbicide 2,4-dichorophenoxyacetic acid (2,4-D). The other is larger and unaffected by 2,4-D. The 2,4-D-stimulated activity absolutely requires 2,4-D for activity and exhibits a period length of about 24 min. Also exhibiting 24 min oscillations is the rate of cell enlargement induced by the addition of 2,4-D or the natural auxin indole-3-acetic acid (IAA). Immediately following 2,4-D or IAA addition, a very complex pattern of oscillations is frequently observed. However, after several h a dominant 24 min period emerges at the expense of the constitutive activity. A recruitment process analogous to that exhibited by prions is postulated to explain this behavior. The hormone-stimulated plant NADH oxidase is a member of a functionally related cell surface ECTO-NOX (for cell surface NADH oxidase) proteins that exhibit both oxidative (NADH or hydroquinone) and protein disulfide-thiol interchange activities. The two activities alternate to generate oscillatory patterns with a period length of 24 min. The proteins function both in cell enlargement and cellular time keeping. This report is part of a larger project about how proteins might learn and teach. NOX proteins have many characteristics in common with prions. A distinguishing property of prions is the ability to undergo a permanent conformational change (to learn) and to transmit this conformational change to other proteins like itself (to teach). The response to 2,4-D appears to be similar and may help us not only to understand how auxin herbicides kill plants but how information may be stably acquired by certain proteins and subsequently transmitted to other related proteins within the same cell or subsequently to progeny cells. *D. James Morré, Dorothy M. Morré, and Philipp Ternes, Auxin-activated NADH Oxidase Activity of Soybean Plasma Membranes is Distinct from the Constitutive Plasma Membrane NADH Oxidase and Exhibits Prion-like Properties, In Vitro Cellular and Developmental Biology – Plant 39: 368 – 376, 2003.*

Nancy H. Ing

Yuhua Z. Farnell

Steroid Hormone Receptors

Estrogens up-regulate estrogen receptor (ER) and progesterone receptor (PR) gene expression in endometrium immediately prior to ovulation to prepare it for nurturing embryos. Most in vitro model systems have lost the ability to up-regulate expression of the ER gene in response to E2 or to express the ER gene at all. Here, we used explant cultures from control and estradiol (E2)-treated ewes and assessed expression of four genes that are up-regulated by E2 in vivo [ER, PR, glyceraldehyde 3-phosphate dehydrogenase (GAPDH) and cyclophilin (CYC) genes] on Northern blots. In cultures from control and E2-treated ewes, ER and PR mRNA levels dropped significantly during 24 h of culture in the absence of E2. GAPDH mRNA levels increased 300% in explants from control ewes to match the higher levels in the E2-treated ewe endometrium (in vivo and in explant culture). The only effect of E2 in the explant cultures was to prevent the decrease in PR mRNA. The new selective estrogen receptor modulator (SERM) EM-800 (EM) decreased ER and PR mRNA levels in explants from control ewes, but up-regulated GAPDH and CYC mRNA levels. EM treatment in vitro mimicked that of E2 in increased the half-life of ER mRNA in endometrial explants. These data illustrate distinct, gene-specific effects of the explant culture process, E2 and EM on the expression of endometrial genes. *Yuhua Z. Farnell and Nancy H. Ing, Extradiol and a Selective Estrogen Receptor Modulator Affect Steroid Hormone Receptor Messenger RNA Levels and Turnover in Explant Cultures of Sheep Endometrium, In Vitro Cellular and Developmental Biology – Animal, 38: 595 – 600, 2002.*

Leyuan Liu, Amy Vo, and Wallace McKeehan

Accelerated Protein Discovery

Protein-protein interaction cloning suggests multi-subunit complexes and pathways and in vitro cell culture technologies and new tracers allow tracking where new proteins go in cells to provide clues about their function. Several years ago we isolated, cloned and sequenced a protein present in cell extracts containing the FGF receptor complex and placed it in GenBank. Increasing protein discovery techniques triggered at least 15 investigators to contact us concerning the protein whose function was unknown, but that it appeared associated with chromatin associated factors and cytoskeletal elements. We combined homology domain analysis, protein-protein interaction cloning and cellular localization to derive clues about the unknown protein. Its primary substrates now in the sequence banks were still of unknown function. However, a second round of interaction cloning using the primary substrates as bait began to yield clues on function. The combined approach suggests a novel complex and pathway that integrates mitochondrial location and the microtubular cytoskeleton with chromosome remodeling, apoptosis and tumor suppression through RASSF1A. RASSF1A is silenced in a large number of tumors by hypermethylation. We believe these findings open up a previously undiscovered pathway involved in tumor suppression through maintenance of genetic stability and destruction of cells with a defective genome. *Leyuan Liu, Amy Vo, Guoqin Liu, and Wallace L. McKeehan, Novel Complex Integrating Mitochondria and the Microtubular Cytoskeleton with Chromosome Remodeling and Tumor Suppress0or RASSF1 Deduced by In Silico Homology Analysis, Interaction Cloning in Yeast, and Colocalization in Cultured Cells, In Vitro Cellular and Developmental Biology – Animal, 38: 582 – 594, 2002.*

Points To Ponder

Senator Kit Bond's 2001 Speech in St. Louis

Schuyler S. Korban, Department of Natural Resources & Environmental Sciences, University of Illinois, Urbana, IL 61801

For those of you who were fortunate enough to attend the Annual Meeting of the Society for In Vitro Biology back in 2001 in the wonderful city of St. Louis, you would readily agree with me that Senator Kit Bond's address to our membership was certainly one of the highlights of the presentations made at that particular conference. Not only was his memorable speech inspiring in both content and style of delivery, but it left an indelible impact on those of us listening to Senator Bond. As a result, his speech will be published in its entirety in the next issues of In Vitro-Animal and In Vitro-Plant.

Given the opportunity to contribute to this "Points to Ponder" column for the very first time, I have volunteered to write down some of my thoughts about the speech itself and what it has meant to me, both as a scientist and as an educator. So, here it goes.

First of all, it is amazing to hear a politician talk about such a hot-button issue such as that of biotechnology with such passion and conviction. Of course, one can attribute this to the given trademark of a successful politician, but nevertheless it is remarkable to think that this senator seems to have a well-balanced understanding of this technology, and its potential impact on society here in the US and elsewhere around the world. It is interesting to hear of his statements regarding the controversy over biotechnology, especially the loud rejectionist claims made by activists here and abroad, and how this controversy has shaped and impacted the public opinion. One statement in particular is of note, and I quote "*There is an old saying about how all that is necessary for wrong to prevail is for good people to do nothing.*" We can all agree that for quite sometime, the arguments made against biotechnology have been led by career activists looking for an issue or issues to reject. This first began with Greenpeace activists in Europe, and then moved over to this side of the pond, and then swept to other corners of the world. Yes, these activists have been quite successful in Europe, even with the ironic turn of events whereby their founding leader (Dr. Patrick Moore) later disavowed these objections, and eventually reversed his opposition to biotechnology.

To most European colleagues that I have talked to or heard from over the past few years, this success by these activists has taken a strong blow to their research activities essentially paralyzing them. Of course, if we are to delve into the reasons behind this negative outcome in Europe and its continued lack of success in the US, Senator Bond clearly outlines some of these reasons in his speech. He mentions that the failure of anti-biotechnology legislation in the US Senate is attributed in part to voices of scientists and scientific organizations raised in support of this technology and refusal of various regulatory agencies, such as EPA, FDA, and USDA, in this country to allow "politics trump science". These are obviously two key elements in thwarting efforts to allow anti-biotechnology legislation to pass through congress. But, there is an additional element that we all recognize as critical in keeping this legislation out of Congress as well as contributing to expansion of the market for and products derived from this technology, and that is the public's perception. Naturally, the public's perception is primarily shaped by the news they come across in the print and electronic media. Senator Bond indicates that US editorial positions have been positive. But we all know that it doesn't take but a few seconds for the rumor mill to turn the wheels when either a preliminary report (mostly based on not so good science), an error (taken out of context), or an unexpected mix-up (someone goofed) is plastered all over the internet, cable news channels, and tomorrow's edition of our local and national newspapers. Obviously, it is the public's perception in Europe and in some other developing countries that have blocked this technology in these areas of the world. We are all aware of the "Golden Rice" example and how the US Congress has responded to the request of Senator Bond in providing funding to the International Rice Research Institute in the Philippines to carry on with this work to fruition.

It is interesting to note that since Senator Bond's speech back in 2001, the use of transgenic products has increased, but there have been some "bumps" along the way. With new biotechnology products coming along, we will continue to face some of these challenges. Such issues as patents and intellectual property rights are still there, and will remain issues of contention. They will be used by detractors as reasons for abandoning this technology. As Senator Bond readily declares that these issues should and must be addressed, but they are not to be used as warning signals against the technology itself. Concerns over food safety issues have once again been brought to the public's attention since the events of 9/11 (approximately 3 months before this speech was given), but of course this time around, biotechnology will most likely play a significant role in protecting and maintaining the safety of our food supply. It is no surprise then that on that day in June of 2001 that Senator Kit Bond finishes his speech by stating the following: "*The fight for plant biotechnology is a fight that is critical not just because of the danger of no improving plant technology. Beyond the specific issue of acceptance of transgenic plant technologies, there is more at stake here and that is whether or not we are going to allow activist organizations to regulate our food or whether we will maintain the science-based system that has served our farmers and consumers for decades*."

One thing for sure is that funding for biotechnology and genomics has certainly increased in the last few years due to the efforts of visionary and courageous legislatures such as Senator Kit Bond, and we are grateful to him and people like him who are championing this important field of science and technology. As scientists, we must continue to voice our opinions, and provide accurate and hard evidence to the science and knowledge of biotechnology. But, we must do so using laymen terms so that the public, and especially the mass media who are reporting to the public, are receiving the right information and hearing it properly. Of course, if we have the oratory skills of a politician like Senator Bond, we can certainly win them over, just as he has done so with the audience that heard his speech at the SIVB meetings in St. Louis back in June 2001. ■

In Vitro Report

Future Meetings

SIVB MEETINGS

2004 – May 22 – 26, World Congress on In Vitro Biology, San Francisco, CA
2005 – TBA, Congress on In Vitro Biology
2006 – June 3 – 7, Congress on In Vitro Biology, Minneapolis, MN

OTHER MEETINGS

2003 – October 26-30, 2003 AAPS Annual Meeting and Exposition, Salt Lake City, UT, www.aapspharmaceutica.com
2003 – November 2-5, 2003, American College of Toxicology 24th Annual Meeting, Washington, DC, Contact: (301) 571-1840, Fax: (301) 571-1852, email: ekagan@actox.org
2004 - March 21 - 25, Society of Toxicology Annual Meeting, Baltimore, Maryland, contact sothq@toxicology.org or call 703-438-3115

PENN STATE BIOTECHNOLOGY COURSES

www.biotech.psu.edu/registration.htm
2003 – September 8-12, Animal Cell Culture Methods and Scale-up Strategies
2003 – October 7-10, Fermentation Methods and Scale-up Strategies
2003 – September 22-26, October 20-24, Separation and Purification Strategies for Biotechnology Products

RUTGERS UNIVERSITY – CENTER FOR RESEARCH AND EDUCATION IN BIOLUMINESCENCE AND BIOTECHNOLOGY

www.rci.rutgers.edu/~meton/biosep.html
2004 – January 11 – 16, March 14 – 19, Protein Purification: Isolation, Analysis and Characterization of GFP
2004 – January 29 – 30, March 29 – 30, Biochemical Separations: An Introduction to Laboratory Techniques

UTAH STATE BIOTECHNOLOGY AND BIOPROCESSING COURSES

www.usu.edu/biotech
2003 – September 16-19, Protein Purification: Isolation and Characterization
2003 – October 21-24, Microbial Fermentation: Development and Scale-up

To contact the Editor: Kimberly Rayford
St. Louis Science Center, Science and Galleries
5050 Oakland Avenue, Saint Louis, MO 63110
Phone: (314) 286-4673; Toll Free: (800) 456-7572, ext. 4673;
Fax: (314) 533-8679; Email: krayford@slsc.org

IN VITRO REPORT NOW ONLINE!
Please make sure your email address is updated with the SIVB Business Office in order to receive notification for all future issues of the In Vitro Report.

IN VITRO REPORT (ISSN 1543-6969) is published quarterly, one volume per year, by the Society for In Vitro Biology (SIVB) 9315 Largo Drive, West, Suite 255, Largo, MD 20774. The subscription nonmember rate is $55 per volume ($70 outside the USA), payable in advance in U.S. funds drawn on a U.S. bank. SIVB members receive IN VITRO REPORT as part of annual dues.