SOCIETY FOR IN VITRO BIOLOGY

In Vitro Report

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A Big Success

2002 Congress on In Vitro Biology

The 2002 Congress on In Vitro Biology was held at Disney's Coronado Springs Resort in Orlando, FL, from June 25 – 29. This year's meeting focused specifically on issues relevant to the Vertebrate, Invertebrate, and Cellular Toxicology Sections of the Society. The SIVB Plant Section members attended the 10th IAPTC&B Congress (see cover article, column two). This year's Annual Meeting was an intimate event allowing more focused presentations and networking. All attendees of the IAPTC&B Congress were invited to attend the SIVB Congress sessions. The sessions were scheduled to involve few concurrent sessions to enable all attendees to be involved in almost every session presented. Over 100 members, nonmembers, and students traveled to Orlando to share in this special experience.

The Lifetime Achievement Awards presentation was held on Wednesday, June 26. Both Drs. Gordon Sato and Sardar Sohi

This Issue

10th IAPTC&B Congress: Plant Biotechnology 2002 and Beyond

The 10th IAPTC&B Congress, the 4th in North America, was held at Disney's Coronado Springs Resort in Orlando, FL, June 23-28, 2002. As the title clearly indicates, the emphasis of the meeting was on the present and potential application of plant biotechnology in the 21st century, i.e., to food production, human health and nutrition, conservation and the environment. Over 1000 participants from 50 countries participated in the Congress that was organized by the American and Canadian Chapters of IAPTC&B, the Plant Section of SIVB and the University of Florida.

In keeping with the theme of the Congress, there were 15 plenary lectures over 4 Plenary sessions. These 45-minute talks by world-class leaders in their fields gave the overall background and current status for the Symposium sessions. The Plenary speakers all gave excellent presentations, which were well received by the attendees.

There were 111 Symposia lectures from 18 concurrent sessions during the 5 days. The title of these sessions included: Biotic, and Abiotic Resistance; Genomics; Gene Expression /Silencing/Targeting; Cell Cycle and Cell Division; Fruit and Seed, Flower, Forest, Turf and Forage Crops, and Space Biotechnology; Biopharming; Improvement of Nutritional Quality; and Phytoremediation/Phytochemicals.

Traditional tissue culture topics were limited to 2 sessions, namely Embryogenesis/Regeneration, and Protoplast/Anther /Embryo Culture.

There were also 2 more general and very interesting sessions on Biotechnology Regulation, Public Policy and Societal Acceptance, and Biotechnology in Developing Countries. Again, the presentations from speakers from around the world were generally of excellent quality. It was clear that tremendous progress is being made in all areas of plant biotechnology, and that this activity is taking place in all parts of the world. Some of the speakers included graduate students, postdoctoral fellows and young scientists from developing countries. As well, there were over 500 posters dealing with all aspects of basic and applied plant tissue culture and biotechnology.

Compared to where things stood at the last Congress in Jerusalem in 1998, tremendous progress has been made on all fronts, thus leading to the optimistic expectation that application of the various in vitro technologies will become very routine in the not too distant future.

The Proceedings of the Congress, including page restricted plenary and symposia lectures, will be published by Kluwer Academic Publishers, The Netherlands.

Congress on In Vitro Biology, continued from cover

were presented with the Lifetime Achievement Award for their work in the field of in vitro biology. Mary Ann Lila presented the award to Dr. Sato, a former president of the Tissue Culture Association (now SIVB) from 1984 to 1986 and Editor-in-Chief of In Vitro Cellular and Developmental Biology from 1987 to 1991. Dr. Sohi was unfortunately unable to attend the event, but his acceptance speech was recorded in Canada and was presented at the Congress by Dr. Guido Caputo to the attendees on Dr. Sohi's behalf. We were sad that Dr. Sohi was not in attendance, but very pleased with his acceptance. *(More on these two distinguished men and their outstanding achievements will be included in future issues of the In Vitro Report.)*

Following the Lifetime Achievement Awards were the two Plenary Sessions. Dr. Sheldon Schuster, director of the Biology Program, at the University of Florida, Gainesville, spoke on "Research and Development in the Biotechnology Industry: Outlook for the Future" (Shirley Pomponi and Lia Campbell, Conveners). His presentation was followed by the Distinguished Plenary Session, with Dr. Gordon Sato from the Department of Fisheries, Masawa, Eritrea, presenting (Wallace McKeehan and Sandra L. Schneider, Conveners). Dr. Sato's presentation was on "The Manzanar Project: Contributions of In Vitro Biology, Tissue Engineering, Proteomics, and Beyond." Both speakers were extremely informative and the attendees' reaction was positive. The session was ended with a reception for all attendees to honor the awardees and presenters.

Another unique event during the Congress was a poster session for the High School students who were presenting their work at the Congress. On Tuesday evening, June 25, the Education Committee held a special session that allowed upcoming scientists, who were new to presenting their work in a scientific forum, the ability to learn these very important skills in a low-pressure environment. Today's students are the future of our research, and this experience should prove to be invaluable for them in the future. Thanks to Liz Roemer for organizing this very important session.

The remainder of the Congress Program included 6 symposia, 2 workshops, 2 contributed paper sessions, and 4 interactive poster sessions. The symposia were: "Is it Good Enough: An Exploration of Practical Approaches Available for Assessing the Predictive Capacity of In Vitro Tests" (Leon Bruner, Convener), "Stem Cell and Organogenesis" (Raziel Hakim and Nam-Ho Hu, Conveners), "Tissue Engineering: How Well We Are Doing" (Gordana Vunjak-Novakovic and Jonathan Garlick, Conveners), "Microgravity Cell Science" (J. Milburn Jessup and Neal R. Pellis, Conveners), " Biological and Chemical Terrorism: Our Risks and Responsibilities" (William Smith, Convener), and "In Vitro Approaches to Production of Marine-derived Drugs" (Shirley Pomponi, Convener). These sessions offered useful information on these topics that are so prevalent in the news now. We wish to thank all of the conveners for their hard work in organizing these sessions and to the speakers for sharing their wealth of knowledge with us.

The Interactive Poster sessions were convened on Wednesday and Thursday. These sessions allowed ample time for questions from the audience and were entitled "Basic Culture Techniques", "Differentiated Epithelium", "Invertebrate and Fish Cell Culture: Generation and Application of Cell Lines", and "Cancer Cells". The two "Cool Technologies" workshops were presented on Friday morning. Program Chair Lia Campbell convened both sessions which discussed "Preparation for Live-cell Imaging", presented by Dan Focht of Bioptechs and "Strategies and Technology for Proteomic Analysis of Eucaryotic Cells" presented by Colette Rudd of Thermo Finnigan. This was followed by the contributed paper sessions. The Vertebrate and Cellular Toxicology Contributed Papers were presented in 2 parts: "Microgravity Bioreactor Cultures" and "Cancer Cells". The Invertebrate Contributed Paper session involved papers on "Proliferation and Differentiation Mechanisms of Insect Stem Cells and Turtle Gonad Cells."

The Congress Banquet was a special event held at Disney's Animal Kingdom. Banquet attendees were bused behind the scenes to the Animal Kingdom right at closing time. They were escorted to the Kilamanjaro Safari to take a unique end-of-the-day tour. The earlier rain that day had ended and many of the animals that normally were not visible were clearly seen by our members. After the tour a private party was held after the park had closed for SIVB. The Awards ceremony was held at that time and awards were given to John Harbell, Distinguished Service Award, and to the 2002 Student Award winners. This year's Student Award Winners were: Kim Elsen (Wilton R. Earle Award and SIVB Student Travel Award), Chhandak Basu (SIVB Student Travel Award), Soroosh Radfar (SIVB Student Travel Award), Alvar Carlson (John S. Song Award), Vivian Dayeh (Honor B. Fell Award, Joseph F. Morgan Award, and SIVB Student Travel Award) and Jeena Easow (Hope E. Hopps Award and the Cellular Toxicology Award). Alison Wiseman, the recipient of the Phillip White Award, was not in attendance. (All Student Award abstracts will be presented in a future issue of the In Vitro Report.)

This year's special Science and Technology Exhibition was held in conjunction with the IAPTC&B's Congress. Over 30 booths were displaying materials of interest to our members: Publishers, informational organization, service providers, as well as the two

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IAPTC&B Congress, continued from cover

The fact that the lectures, the poster sessions, coffee breaks, and meals, as well as the Science and Technology Exhibit, were all in the same contiguous area meant that there was ample opportunity for the participants to meet, renew acquaintances, and exchange ideas. The excellent facilities at the Congress site added to the exciting atmosphere.

During the Congress, the IAPTC&B Council accepted the proposal to hold the 11th Congress in Beijing, China in August 2006. The new Executive Committee consists of Prof. Zhi-Hong Xu (China), President; Prof. Jia-Yang Li (China), Secretary-Treasurer; Dr. Eng-Chong Pua (Singapore), Editor; Prof. Indra K. Vasil (USA), Past-President; and Profs. Gynheung An (Korea), Horst Lorz (Germany), and Alejandro Mentaberry (Argentina), as Members. It was also agreed that the IAPTC&B journal will continue to be published as part of In Vitro Cellular & Developmental Biology-Plant.

The Congress was indeed a success and thanks are due to many, including Indra Vasil, the outgoing President of IAPTC&B; Michel Caboche, Chair of the International Advisory Committee; Rob Horsch, Chair of the Science & Technology Exhibit Committee; Roger Beachy, Chair, National Advisory Committee; Dan Cantliffe, Chair of the Local Organizing Committee; and Marietta Ellis, Managing Director SIVB and her staff; and the various members of the above Committees. We look forward with eager anticipation to the next Congress in Beijing.

Trevor A. Thorpe

Invertebrate Section Meeting Report

The 2002 Congress on In Vitro Biology was held June 25 – 29, in Orlando, Florida. The invertebrate section has succeeded in achieving all the goals in symposiums and sessions, which included: 1) the Joint Vertebrate/Invertebrate/ Toxicology Symposium entitled "Stem Cells and Organogenesis" (Ray Hakim and Nam-ho Huh, conveners), sponsored by Aventis Cropscience (now Bayer Cropscience) and the Japanese Tissue Culture Association; 2) the Joint Invertebrate/ Vertebrate Symposium entitled "In Vitro Approaches to Production of Marine-Derived Drugs" (Shirley Pomponi, convener), sponsored by GlaxoSmithKline; 3) a contributed paper session chaired by Marcia Loeb on "Proliferation and Differentiation Mechanisms of Insect Stem Cells and Turtle Gonad Cells"; 4) an interactive poster session (Guido Caputo, moderator) on "Invertebrate and Fish Cell Culture: Generation and Application of Cell Lines".

For the next two years, 2002-2004, we have new officers for the Invertebrate Section. Amy Wang (GlaxoSmithKlien, RTP, NC USA) is the president; Guy Smagghe (Ghent University, Ghent Belgium) is the vice president. Guido Caputo (Natural Resources Canada, Canadian Forest Service Great Lakes Forestry Centre, Canada) will remain in his role as secretary. During the Congress, we had a section business meeting. The new officers thanked the previous officers for their hard work and commitment. Cindy Goodman and Ray Hakim offered to continue their support of our section. We discussed the plan and topics for the 2003 and 2004 Congresses. We also discussed strategies for recruiting new members to the invertebrate section and for fund-raising. Additionally, Ray Hakim agreed to represent our section on the Membership Committee, which has been charged with the task of finding new ways to recruit new members and attract more people to our meetings.

Amy A. Wang

Invertebrate Cell Biologist Recognized for Lifetime Achievement Award

On June 26, 2002 at the 2002 Congress of In Vitro Biology in Orlando Florida, the invertebrate section proudly presented the 2002 Society for In Vitro Biology Lifetime Achievement Award to one of our distinguished members, Dr. Sadar Sohi. Dr. Sohi has been a member of SIVB for more than 30 years. In the early 1970's he and others organized the invertebrate section. Dr. Sohi is internationally known for developing continuous insect cell lines and other in vitro systems. Dr. Sohi was successful in showing the scientific community that insect tissue culture was both a viable tool as well as a practical method for pathogen propagation. Natural Resources Canada, Canadian Forest Service, Great Lakes Forestry Centre sponsored this award. *There will be a feature article on Dr. Sohi and his award in a future issue of the In Vitro Report.*

Amy A. Wang

New APHIS Position Announced

On June 17, 2002, Under Secretary Bill Hawks and Bobby Acord, APHIS Administrator announced the establishment of a new Biotechnology Regulatory Services (BRS) organization within the Animal and Plant Health Inspection Service (APHIS). They envision BRS to become the "world's premier agricultural biotechnology regulatory organization." This new organization will ensure a rigorous and effective regulatory system that is fair and transparent and that will earn and maintain the confidence of the American public.

To fulfill this vision, they are seeking an exceptional individual for the position of Deputy Administrator for Biotechnology Regulatory Services. We hope to attract outstanding candidates for this Senior Executive Service position from a broad array of sources and organizations. The candidate must have the technical background, management experience, and leadership qualities to create a scientifically based regulatory unit that meets the vision and expectations of USDA leadership. The official vacancy announcement at http://jsearch.usajobs.opm.gov/ftva.asp?OPMControl=IF3940 or by entering 3940 in the Quick Search box at http://www.usajobs.opm.gov and clicking through the Deputy Administrator and View vacancy announcement links to the full position description. We encourage you to apply by the closing date of Monday, August 26, 2002.

Bridging Plant and Animal

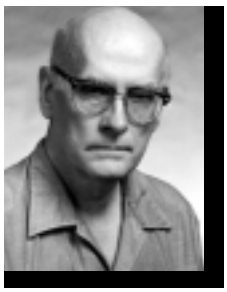
A nice example of bridges and collaboration between plant and animal sciences including aspects utilizing experimental systems in vitro are two recent publications Liu et al. (2001) *Citrus pectin: characterization and inhibitory effect on fibroblast growth factor-receptor interaction. J. Agric. Food Chem.* 49: 3051-3057, and Liu et al. (2002) *Influence of harvest time on citrus pectin and its in vitro inhibition of fibroblast growth factor signal transduction.* J. Sci. Food. Agric. 82: 469-477.

The work was the result of collaboration among the prostate cancer research group of Dr. Wallace McKeehan in the Center for Cancer Biology and Nutrition, Texas A&M University System Health Science Center in the Texas Medical Center, Houston, plant experts led by Dr. Bhimu Patil at the Citrus Center, TAMU-Kingsville in the Rio Grande Valley of Texas, and carbohydrate chemists at UT-PanAm in the Valley.

The work showed that unique carbohydrate oligosaccharides hidden away in the bulk pectin fraction of citrus mimics the essential mammalian carbohydrate heparan sulfate required for functioning of the FGF signaling complex. The FGF signaling complex is ubiquitous, mediates cell to cell communication in tissues and derangement underlies pathologies including prostate cancer. Dr. McKeehan's group provided the animal cell assays and models for testing the oligosaccharides isolated and characterized by the plant scientists in the field and laboratory. Apparently the bioactivity of the citrus pectin fraction is a combination of generation of the most active precursor material for modification after ingestion and further modification on its way to cellular targets. The studies have attracted media attention because they suggest a potential target for dietary prevention that could impact the FGF signaling complex in progression to malignancy, the life-threatening aspect of prostate cancer. Citrus and other plant sources of potent bioactive oligosaccharides may be a useful source of precursor material for further chemical modification and application as a pharmaceutical agent in addition to dietary source.

Wallace L. McKeehan

Dr. Harry Sommer Remembered



Dr. Harry Sommer

Dr. Harry Sommer who died in May was a pioneer in the field now known as plant biotechnology. In particular, Dr. Sommer was recognized world-wide as an expert in the area of woody plant cell and tissue culture. Although he worked with a number of forest trees, he was most famous for his ground-breaking work with tissue culture of pine trees. His was the first report ever published demonstrating that pine trees could be clonally propagated using tissue culture [Sommer et al. 1975. Differentiation of plantlets of longleaf pine (Pinus palustris Mill.) tissue cultured in vitro. Bot Gaz. 136:196-200]. His research formed the basis for in vitro propagation of conifer species in laboratories throughout the world.

Dr. Sommer received his Ph.D. in Biochemistry from Ohio State University. He worked as a Research Associate at the University of Georgia School of Forest Resources with Dr. Claud Brown, then as a Tissue Culture Scientist with Weyerhaeuser Company, before returning to join the Faculty at the University of Georgia in 1976. In addition to his research, Dr. Sommer taught courses in plant tissue culture and tree growth and development. He trained and mentored a number of students from the U.S. as well as other countries, who went on to become very successful researchers at universities and forest products companies. His depth of knowledge and willingness to share his knowledge with others, usually on a one-on-one basis, made a huge difference in the education of many scientists.

Scott A. Merkle

Mark Your Calendar Now for Portland

Plan now to attend the 2003 SIVB meeting in Portland, Oregon for stimulating scientific sessions and think about spending a few extra days!

Oregon. The very word inspired the largest voluntary land migration in recorded history, and not without good reason. Windswept beaches, verdant forests and snow-capped peaks give way to sweeping rangelands, towering rock formations and dramatic river valleys in this incredibly diverse land. Mother Nature's finest elements provide the perfect foil for human innovation, and the result is a vast and ever-changing playground for the soul. We invite you to discover a state where renowned chefs, four-star hotels and world-class golf exist side-by-side with roadside diners, yurts and snowboarding. Oregon. Things look different here. http://www.traveloregon.com/Oregon is also home to the Oregon Health Sciences University http://www.ohsu.edu/, Oregon State University http://www.orst.edu/, Portland State University http://www.psu.edu the University of Oregon http://www.uoregon.edu/ and much, much more http://www. el.com/to/oregon/

Just across the Columbia River in Washington State http://www.experiencewashington.com/ there are plenty of things to see and do too, like a visit to Mt. St. Helens http://www.fs.fed.us/gpnf/mshnvm/. Plan ahead for a great 2003 meeting experience.

Barbara M. Reed

Erratum

In the Annual Report for 2001 in the last issue of the In Vitro Report, Delia Bethell was incorrectly listed as the Nominating Committee Chair for 2002 – 2004. Mary Ann Lila is the new Chair of the Nominating Committee for the years 2002 – 2004. We apologize for this error.

ExPlants

This quarter there are many activities to report surrounding the recent annual meeting.

On Wednesday June 26th at the Plant Business meeting held during the SIVB/ IAPTC&B meeting in Orlando, the new officers of the Plant Division began their two-year terms. The new officers are **Nancy Reichert**, Mississippi State University, President; **Sue Rogers**, Salem International University, Vice-President; and **Lisa Lee**, The Scotts Company, Secretary/Treasurer. A debt of gratitude to the outgoing officers **Michael Horn**, **Charles Armstrong** and **Heidi Kaeppler** for their commitment to the Plant Division and to SIVB.

Words from the new President, **Nancy Reichert**:

"I appreciate the opportunity to serve as President of the Plant Section. Mike Horn did an outstanding job for us as President the last four years. Thanks Mike! Today, we are **480+** members strong. Among those are worthy nominees for Plant Fellow and Lifetime Achievement Awards. Start thinking about who you could nominate for each. As we prepare to recognize valued members, we must also prepare for the future by attracting new members. Look around your lab and institution. Invite your colleagues to join or send me (nreichert@onyx.msstate.edu) their contact information and I will invite them. We also need to enhance our fund raising efforts. One of the last actions Mike took as President, was to create a Plant Section Development Committee with Mark Jordan as Chair. Contact Mark (or me) with your offers of help and suggestions in this major effort."

You can contact Mark Jordan at mcjordan@agr.gc.ca.

A flyer outlining the sessions and workshops for the Plant Program 2003 in Portland, Oregon was included in each registration bag at the IAPTC&B Congress. The flyers were successful in generating interest and enthusiasm for the program. Please encourage new contacts you made at the meeting to join the SIVB and attend the meeting next year.

The Lifetime Achievement Award given by the SIVB is for Plant Division members too! Please consider nominating someone who has made a difference in how you do plant tissue culture. The purpose of the award is to recognize significant contributions made to the science of in vitro biology, which have made a lasting impact on what we as in vitro biologists do and how we get it done. The recipient must be a member of SIVB but does not need a history of service to the Society. I will let you know whom to contact about nominating someone for a Lifetime Achievement Award in the next issue of exPlants.

A huge thank you goes to **Mike Horn** for his many years serving as editor of exPlants. He provided news and updates on our colleagues and friends and kept us informed on activities within SIVB. Mike had the following comments to make:

"This exPlants column represents a double transition for me personally and for all members of the Plant Section who read it regularly. Starting with this issue, Melissa Hinga, a rising star in the plant biotech arena, will be your new exPlants editor. She brings with her an amazing vitality that will re-energize this column. As editor of exPlants for the past 12 years, I have had my ups and downs but it has been enjoyable over all. Most of all I want to thank all the contributors without whom there would have been no exPlants. I would ask all Plant Section members to send their news to Melissa. It will make her new job so much easier! And I should know!

This time also represents my first month in nearly 4 years that I am not the Plant Section president. The honorable Nancy Reichert (Miss. State) succeeds me in that role and I know that, with your help,

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Explants, continued from page 4

she will do a fantastic job. Please give her the wonderful support you have given me the past 4 years. Thank you for giving me the opportunity to serve you in that capacity

I hope to get back to drawing plant tissue culture-based cartoons (remember them?) and I have promised the editor of In Vitro Report, Martie Wright, I will organize some special articles. I look forward to these challenges. You haven't seen the last of me! Thanks again to everyone!"

Thank you Mike for making us laugh and keeping us in touch with one another. We look forward to future installments of your cartoon!

Mary Ann Lila announces the arrival of three new members to her lab: **Barbara Schmidt** from AZ State who is starting a PhD program with her on bioflavonoid production in cell cultures and anticancer bioassays, and **J.Yon Jo** from Korea who will be working on tracing the metabolic fate of flavonoids using products produced in plant cell cultures. **Mary Grace**, a new Post-Doc from Egypt, will similarly be working on metabolic fate studies with labeled cell culture bioflavonoids.

> Mary Ann has accepted a position as Assistant Dean in the College of Agricultural, Consumer, and Environmental Sciences Office of Research beginning in Fall 02 as soon as her term as interim head of the Department of Natural Resources & Environmental Sciences is finished. The Dean is currently negotiating with a candidate for headship.

Ray Shillito reports Bayer CropScience was formed on June 3 through the merger of Bayer's Crop Protection Business Group with Aventis CropScience SA, and began operating on June 4, 2002. The BioScience group, which comprises the seed and biotechnology businesses, will be headquartered worldwide in Lyon, France. BioScience in North America has its headquarters in Research Triangle Park, NC.

Please contact me if you would like to see your name in the next exPlants column. Let your colleagues know what exciting things are happening in your lab or office and what changes are going on in your life. You can email me at mhinga@ricetec.com or write to **Melissa Hinga**, RiceTec, Inc., PO Box 1305 Alvin, TX 77512.

Melissa E. Hinga

Continuing Education Online Course Offered

Dr. Carol Stiff, President of Kitchen Culture Kits, Inc. and an active member of the SIVB Education Committee, will be offering an online plant tissue culture course beginning August 2002. It will be listed as a continuing education class that is worth 40 CEUs through Austin Community College.

The course will be offered in BlackBoard format. Carol is hoping to include "guest scientists" who can participate in short (30-60 minute) chat room discussions on various topics. If you are willing to be a guest, please contact Carol at kck@turbonet.com for more information.

Experiments will also be conducted by the students in the homes or classrooms, and vendors who might be interested in selling supplies to the students (e.g. media, agar, hormones, etc.) should contact Carol so they can be included on the class website resource list.

Here is the tentative description:

Plant Tissue Culture Techniques - Online
BITC 1091 400
Total Contact Hours - 40
Instructor - Carol Stiff
Tuition - $175.00

Description - Designed to teach the basic concepts, terminology and methods of plant tissue culture to the hobbyist, student, teacher, commercial grower and other interested people. Includes on-line lectures on basic plant physiology and culture methods and hands-on laboratory exercises to learn and practice the techniques. These labs can be performed in a typical kitchen or school classroom. Sources of needed supplies will be provided; students will need to purchase supplies to complete the exercises. Course must be completed within 6 months to earn CE credit. Contact: kwhite@austin.cc.tx.us for more information.

Please send any suggestions, comments, etc. to: Carol M. Stiff, Ph.D. Kitchen Culture Kits, Inc. http://www.kitchenculturekit.com 936-699-3551 FAX 936-699-3553

Carol M. Stiff

Words to live by: "Obstacles are those frightful things you see when you take your eyes off the goal." Henry Ford

CLASSIFIEDS

ASSISTANT PROFESSOR

Salem, WV As part of an aggressive building program in Bioscience, Salem International University is searching for an Assistant Professor in the area of plant molecular biology and molecular genetics. The faculty will teach undergraduates and participate in the Master degree graduate program in molecular biology and biotechnology. The academicenvironment and the newly renovated research facilities, including a biocontainment level 3 facility, are excellent. Successful applicants will engage in scholarly work related to their research interest, and are expected to interact with bioscience faculty. Applicants should send resume, accompanied by his/her official transcripts, 3 letters of references, up to 3 reprints, and a statement of research and teaching interests to: Molecular biology Search Committee, Department of Bioscience, Salem International University, 223 West Main Street, P.O. Box 500, Salem, WV 26426-0500

POSTDOCTORAL MOLECULAR BIOLOGIST POSITION

The Project: The project focuses on the molecular biology and biochemical characterization of an insect-associated poxvirus (entomopoxvirus, EPV). The virus is introduced into the insect host by a parasitic wasp and invades and replicates in the host's hemocytes (blood cells). Viral infection disrupts host defense capabilities and induces apoptosis and the expression of novel parasitism-specific proteins. This virus-vector-host system is relatively new and provides a variety of research opportunities for an enthusiastic and creative postdoctoral scientist. Duties: The appointee will: (1) optimize existing cell culture systems for virus culture to investigate viral morphogenesis and gene expression; (2) utilize current molecular techniques to further characterize viral genes in clones from existing genomic libraries and develop a restriction map of the viral genome; (3) identify and sequence viral transcripts from infected hosts and express selected genes in vitro with the goal of determining their function; (4) use current bioinformatics tools for gene analysis and phylogenetic studies; (5) assist undergraduate and graduate students in selected molecular techniques, etc.; (6) submit research results for publication in a timely manner, and perform other duties as assigned. The appointee may participate in other projects including: (1) sequencing and bioinformatic analysis of the poxvirus genome; (2) development and use of monoclonal antibodies to characterize hemocytes involved in the cellular defense response, and (3) in vitro translation of an apparent anti-viral protein (cDNA clones already available). Qualifications: A Ph.D. in molecular biology or virology and willingness to work with insect systems are required.. Appointee must be ethical, reliable, willing to work in a team and take constructive criticism, be innovative and willing to try new approaches; Must be knowledgeable about standard and state-of-the-art molecular techniques and be willing to learn new ones. Must have an excellent command of english, good writing skills, and be able to design experiments and work independently in a small (5-7 people), well equipped laboratory. Canadian citizens and legal residents are welcome to apply. All non-Canadian and non-US citizens and non-residents must already have legal authorization to work in Canada or the United States at the time of application. No offer can be made without a face-to-face interview. Renewal of appointment is on the basis of an annual review. Reappointments are based on satisfactory performance. Salary is negotiable and commensurate with experience but the minimum will be (US) $35,000 per 12 months plus coverage for health insurance. With satisfactory evaluation, an annual salary increase will be provided based on the State of Florida guidelines. All reasonable expenses will be paid to attend one national or international scientific meeting per year, to present results of work conducted on this project. Send curriculum vitae, statement of interest and the names of four referees, their postal and e-mail addresses, and phone numbers to: Dr. Pauline O.Lawrence, Department of Entomology and Nematology, University of Florida, Gainesville, Fl. 32611-0620. Phone: 352-1901, ext 127; Fax: (352) 846-2011; e-mail: pol@gnv.ifas.ufl.edu Deadline: As soon as a suitable applicant is identified.

SENIOR BIOLOGICAL SCIENTIST

University of Florida, Gainesville, Florida, Position # 963980 The University of Florida, Entomology and Nematology department is currently recruiting for a Senior Biological Scientist. Competitive applicants will possess experience with Insect viruses, DNA purification, restriction enzyme digestion, Southern, northern, western blotting, and DNA sequence analysis. Experience with current bioinformatics tools, cell culture, SDS -PAGE and agarose gels, laboratory supervision, and the ability to write clear and accurate research reports, is preferred. This position will also supervise laboratory assistants and coordinate laboratory activities. Also, prepare materials, methods, and results including graphs and figures/tables for publication in appropriate journal format in consultation with supervisor. Some respirator use required. Minimum qualifications include a Bachelor's degree and three years of appropriate work experience. Interested applicants should apply at the Central Employment Center, 4th Floor Stadium West, Gainesville, FL 32611. Refer to position #963980. You may download the USPS application http://www.ups.ufl.edu. If an accommodation is needed to apply due to a disability, please call (352) 392-4621 or TDD (352) 392-7734. Minimum salary for this position is $31,000. This is a State funded position that provides full health, vacation, and other benefits. Information about specifics of the position can be had by sending an e-mail to pol@mail.ifas.ufl.edu. However, formal application must be made through the Central Employment Center at the address above.

ASSISTANT/ASSOCIATE CELL BIOLOGIST

Harris Moran Seed Company, a leader in vegetable seed research, production and sales is seeking a motivated individual to fill the position of cell biology assistant/associate. Experience in plant tissue culture is required. Responsibilities include induction, culture, and *in vitro* selection of plants primarily arising from dihaploid production and transformation experiments. Working well within a defined team approach as well as having strong organizational and computer skills is requisite. The jobholder should have a familiarity with greenhouse plant maintenance and be comfortable with field evaluation. Technical experience in flow cytometry, HPLC, and GC are desirable. A B.S. in cell biology or a related field is required. Harris Moran, which is a member of the international Limagrain Group, offers a competitive salary and benefits package corresponding with experience. Please send a letter of application, resume, and references to Cell Biology Coordinator, Harris Moran Seed Company, 9241 Mace Blvd., Davis, CA 95616 or email to m.pieper@harrismoran.com

Journal Highlights

Victòria Marfà, Enric Melé, Jean Michel Vassal, and Joaquima Messeguer

Assays Determine Insect Resistance of Transgenic Rice

To determine the degree of insect resistance in transgenic plants, different bioassays are used which typically use either whole plants or small pieces of leaves or stems of transgenic plants, following culture under greenhouse conditions. An *in vitro* insect feeding bioassay is presented which permits the infestation of transgenic plantlets with newly hatched larvae from the striped stem borer. The bioassay consists of the germination of rice seeds in vitro using MS medium in test tubes, and then infestation of each 3-4 cm long seedling with one neonate larva obtained from surface sterilized eggs of *Chilo suppressalis*. The infested *in vitro* plantlets are kept in culture rooms at 25ºC for several days and then the seedling damage and the growth of the larvae are analyzed. Senia (japonica variety) homozygous transgenic rice plants were used for theses experiments. The plants were transformed with either the *cry1B* or the *maize proteinase inhibitor (mpi)* genes. Both genes confer resistance to *Chilo suppressalis*. With non-transformed plants the larvae grew and developed normally, feeding on the small rice plantlets. In contrast, with *cry1B* plants, the neonate larvae died during the first days of the infestation. These plantlets recovered completely and developed similarly to the non-infested control plants. With transgenic plants transformed with the mpi gene, the neonate larvae did not die but grew more slowly compared with the controls. Thus, this in vitro insect feeding bioassay is a rapid and easy method to detect the resistance of *cry* and *mpi* transgenic plants to stem borers such as *Chilo suppressalis. Victòria Marfà, Enric Melé, Jean Michel Vassal, and Joaquima Messeguer, In Vitro Insect Feeding Bioassay to Determine the Resistance of Transgenic-rice Plants Transformed with Insect-resistance Genes Against Striped Stem Borer* (Chilo suppressalis)*, In Vitro Cellular and Developmental Biology – Plant 38: 310 – 315, 2002.*

A. Gulati

P. Schryer

A. McHughen

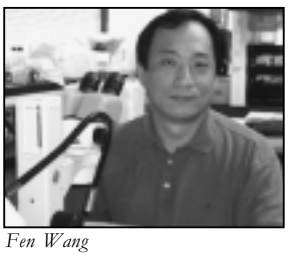
Transgenic Lentil Via Bombardment

A reproducible system for gene transfer in lentil through particle bombardment is presented. Lentil cotyledonary nodes excised from germinated seedlings were bombarded with a plasmid containing a mutant acetolactate synthase gene (ALS) from tobacco conferring resistance to sulfonylurea herbicides. Putative transgenic shoots regenerated on MS medium supplemented with 6-benzylaminopurine (BA) and chlorsulfuron (5 nM for first 4 wks followed by 2.5 nM for the remainder of the culture period) were micrografted and successfully transferred to soil. T_0 and selfed progeny plants were screened using metsulfuron herbicide leaflet painting. The non-transformed escapes died and transformed plants survived the test. The surviving plants were phenotypically normal and produced viable seeds. The presence and stable transmission of the transgene into genomic DNA of screened T_1 transformants was confirmed by PCR and Southern hybridization. This method for producing transformed plants will allow new opportunities for lentil breeding to produce improved cultivars. *A. Gulati, P. Schryer, and A. McHughen, Production of Fertile Transgenic Lentil* (Lens culinaris Medik) *Plants Using Particle Bombardment, In Vitro Cellular and Developmental Biology – Plant, 38: 316 – 324, 2002.*

James J Grasela

Insect Cells as Stabilization Barriers for DNA

A cell line from *Trichoplusia ni* (TN-CL1) infected with the *Autographa californica* multiple nucleopolyhedrovirus (AcMNPV-HPP) and a cell line from *Helicoverpa zea* (BCIRL-HZ-AM1) infected with the *Helicoverpa zea* single nucleopolyhedrovirus (HzSNPV/BrCL2) were subjected to UV-B irradiation at a predetermined level of exposure that would inactivate greater than 95% of the virus inoculum. The working hypothesis was that the homologous insect cells would utilize their inherent DNA repair mechanism(s) to prevent, repair or at least mitigate the damaging effects of UV-B light on viral DNA synthesis. We attempted to determine this by using infected cells that were subjected to UV-B irradiation at different postinoculation periods under two experimental treatments of exposure: (1) shielded and (2) non-shielded. Of the two cell lines infected with their respective homologous viruses, virus from TN-CL1 cells were the least sensitive to UV-B light, as their extracellular virus (ECV) and occlusion body (OB) levels were higher than those from virus-infected BCIRL-HZ-AM1 cells across all the tested postinoculation periods. Production of ECV and OB from both cell lines was lower in the exposed, non-shielded treatment than in the exposed, shielded treatment. However, AcMNPV-HPP was produced in enough quantity to indicate that TN-CL1 might impart a level of protection to the virus against UV light. *James J Grasela, Arthur H. McIntosh, Carl M. Ignoffo, and Cynthia L. Goodman, Insect Cells and Their Potential as Stabilization Barriers for DNA of Multiple and Single Nucleopolyhedroviruses Against Ultraviolet-B-simulated Sunlight Inactivation, In Vitro Cellular and Developmental Biology – Animal, 38: 173 – 177, 2002.*



Fen Wang

Phosphorylation of SNT1

A partnership between the ectodomain of fibroblast growth factor receptor (FGFR) isotypes and the chains of pericellular matrix heparan sulfate determines fibroblast growth factor (FGF) and cell type-specificity of the FGFR signaling complex. The contribution of the FGFR intracellular tyrosine kinase domains to specificity of FGFR signaling is unclear. This report shows that the quantity and quality of phosphorylation of FGFR kinase substrate SNT1 (also called FGFR substrate 2, FRS2) is both FGFR isotype- and cell type-specific in prostate tumor epithelial cells at different stages of malignancy. Epithelial cell-resident FGFR2 that promotes homeostasis yields a low level of phosphorylated 65-kDa SNT1. Phosphorylation by ectopic FGFR1 that promotes malignancy was much more intense and yielded a phosphorylated 85-kDa SNT1. The amount of 85-kDa SNT1 increased by 20-fold during proliferative aging of FGFR1-expressing cell populations that is required for FGFR1-stimulated mitogenesis and the malignant phenotype. In addition, the receptor-specific differential phosphorylation of SNT1 by FGFR isotypes, both of which are normally anchored to the cell membrane, occurred only in intact cells. Therefore, similar to kinase subunits within the heparan sulfate-FGFR complex, cell membrane and cytoskeletal context likely determines FGFR isotype- and cell type-specific conformational relationships between FGFR kinases and external substrates. This determines quantity and quality of SNT1 phosphorylation and differential signaling. *Fen Wang, Cell- and Receptor Isotype-specific Phosphorylation of SNT1 by Fibroblast Growth Factor Receptor Tyrosine Kinases, In Vitro Cellular and Developmental Biology – Animal, 38: 178 – 183, 2002.*

Points To Ponder

The Environmental Benefits of Transgenic Salmon

Wayne Parrott

Most of the news on transgnenic salmon reads much like the one found on the Greenpeace webpage: "GE fish threaten world's oceans with irreversible damage." To drive the point home, users may log on to the Greenpeace web site and "Create your own Frankenfish" at www.greenpeace.org/~geneng/highlights/gmo/GEfish_new2.htm. As with most propaganda on GMOs, critical details are omitted from the news, thus giving the appearance of a problem when there really is not one. For this issue, Dr. Tillmann Benfey presents the other side of the issue:

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The first transgenic animal likely to be approved for sale for human consumption in North America is a strain of Atlantic salmon which over-expresses growth hormone and therefore grows at much faster rates than its non-transgenic progenitors. Research on producing these fish began at Memorial University of Newfoundland in the early 1980s, and is now conducted at Aqua Bounty Farms on Prince Edward Island, Canada. This work is currently at pre-commercial stages and all fish are held within government-approved secure facilities. Aqua Bounty Farms is now negotiating with the US FDA the terms for a science-based assessment of the risks which these fish pose to the environment if reared in the more open systems characteristically used in the salmon aquaculture industry.

Approval of these fast-growing transgenic salmon for commercial aquaculture is currently an issue of considerable debate in North America. Although groups such as the Environmental Defense Fund and Greenpeace portray these fish as posing unacceptable risks to the environment, it is my belief that their use may actually reduce the environmental impacts of salmon aquaculture as currently practiced.

Traditional salmon farming takes place in two environments: freshwater hatcheries, where the fish spend the first year to year-and-a-half of their lives, and seawater cages, where the fish are grown to market size in a further one to two years. The direct environmental impacts of farming fish in this way fall into three general categories: the escape of fish which may subsequently have genetic (through interbreeding) or ecological impacts on wild populations, the release of faeces, metabolites and uneaten food into the surrounding bodies of water, and the amplification of pathogen loads. The use of fast-growing transgenic fish can reduce or eliminate all of these impacts.

The issue of escapes is not generally appreciated by people more familiar with the farming of terrestrial livestock. When a fence is knocked down or a gate remains open, it generally is not difficult to retrieve the cows, pigs or sheep that may escape. On the other hand, if a salmon cage is damaged or destroyed, it is impossible to recover the fish that escape. However, the genetic impacts of such fish, be they transgenic, exotic or simply domesticated, can be eliminated by ensuring that only sterile fish are used in aquaculture. The induction of triploidy in salmon, achieved by applying hydrostatic pressure to eggs shortly after fertilization, is a reliable technique for rendering the fish sterile. Triploids have been advocated for use in commercial salmon farming for a number of years but have not been embraced by the industry because of their poorer growth compared to fertile diploids. The accelerated growth of transgenic salmon would more than compensate for this, allowing for the broader use of sterile fish in aquaculture. Thus, one of the most contentious issues of salmon farming would be eliminated.

An alternative to traditional marine salmon farming in cages is to use on-shore facilities with pumped sea water and high water recirculation rates. Under such conditions it becomes possible to purify effluent before it leaves the facility and to totally eliminate pathogens, thereby addressing the two other environmental impacts commonly associated with traditional salmon farming. However, these systems are more costly to construct and operate than sea cages, and therefore are not generally used for commercial salmon farming. The shorter production cycle of fast-growing transgenic salmon should make these environmentally-friendly systems affordable.

A less direct environmental impact of aquaculture which has recently received attention is the high requirement for fish meal and fish oils in salmon diets. These products are derived from capture fisheries on the high seas. Here again the use of fast-growing transgenic salmon is advantageous: they have been shown to have improved food conversion efficiency compared to non-transgenic siblings, meaning that it takes less food to produce a given amount of flesh using the transgenic fish. Not only does this reduce the consumption of fishmeal and oils, it increases the profit margin for the farmer and reduces the amount of organic waste. It is also conceivable that transgenesis can be used to develop strains of salmon which feed directly on diets produced from plant proteins and oils, and thereby effectively living at a lower trophic level than their non-transgenic siblings.

Salmon farming provides a stable and valuable livelihood in many coastal communities that have faced chronic high unemployment due to the collapse of traditional capture fisheries. Any technology which can improve aquaculture production should be fairly assessed. The evaluation of transgenic salmon should be viewed as a positive development rather than being shunned before any meaningful science-based risk assessment has been made. I look forward to the outcome of the FDA's assessment of these fish.

Congress on In Vitro Biology, continued from page 2

hosting Societies. The booths were very busy and all of the exhibitors were pleased with the response they received at the event.

The Congress was a great success due to all the hard work of the Congress Organizers, Scientific Advisory Board, Conveners, and Speakers. Thanks go out to all those able to attend this special event. 2003 looks to be even more exciting and we hope to see you in Portland, Oregon next year!

Cynthia L. Goodman

In Vitro Report

Future Meetings

SIVB MEETINGS

2003 – May 31-June 4, Congress on In Vitro Biology, Portland, OR

OTHER MEETINGS

2002 – September 1-5, 4th International Symposium on Aquatic Animal Health, New Orleans, LA, Contact Ron Thune, Department of Pathobiological Sciences, School of Veterinary Medicine, Lousiana State University, Baton Rogue, LA 70803, (225) 578-9680, www.vetmed.lsu.edu/isaah2002.htm

2002 – October 20-22, V Argentine Symposium on Plant Biotechnology, Buenos Aires, Argentina. Email: ayuda@biotecnologiavegetal.com or www.biotecnologiavegetal.com.

2002 – November 10-13, American College of Toxicology Annual Meeting, Hershey, PA. Contact (301) 571-1840, email: ekagan@actox.org or www.actox.org

2002 – November 10-14, 2002 AAPS Annual Meeting and Exposition, Toronto, Ontario, Canada. Contact (703) 243-2800, Email: meetings@aaps.org

2003 – August 17 – 23, 4th International Symbiosis Society Congress, Halifax, NS, CANADA. Contact Douglas Zook, ISS President and Associate Professor of Science Education and Biology, email: dzook@bu.edu or Associate Editor of Symbiosis journal and Dean of Science at Saint Mary's University, Halifax, David Richardson at david.richardson@stmarys.ca, web-site: people.bu.edu/dzook.

PENN STATE BIOTECHNOLOGY COURSES

2002 – September 9-13, Animal Cell Culture Methods and Scale-up Strategies

2002 – October 8-11, Fermentation Methods and Scale-up Strategies

2002 – October 22-25, Separation and Purification Strategies for Biotech Products

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