THE UNIVERSITY OF GEORGIA FRANKLIN COLLEGE OF ARTS AND SCIENCES

PLANTBIO

A DEPARTMENT OF PLANT BIOLOGY NEWSLETTER JUNE 2011

Go Plants!

Intensive learning in the field and classroom

From classroom introduction (left), Glenn Galau takes his class out for first-hand observations (center).

Students paddled Long Creek to explore one of their wetlands study sites (right). Field sites in the Athens area include Rock and Shoals, the wetlands installation on Spring Street, Trail Creek off Olympic Drive, the flood plane and beaver pond area at the State Botanical Garden, the annex region across the Oconee River and Long Creek in Olgethorpe County.

Glenn Galau has been a faculty member in the Plant Biology Department since 1981. In his 30 years at UGA he has spent many hours in the classroom, but his favorite teaching venue is the great outdoors. With that venue in mind, in 2008, Glenn designed and taught a new undergraduate class entitled Plant Biology Intensive Lab PBIO (BIOL) 3660L. "The emphasis is on working in a natural habitat, experimental design, data collection and analysis, and the use of local and international databases. Students are encouraged to collaboratively identify their own research questions that can be addressed by the common techniques taught in the course," said Glenn. One group of students set up a research project to address the increasing importance of wetlands restoration and storm-water pond management. Currently plants are only available from distant nurseries. Would local native plants perform better? To answer this question, students first collected and identified plants from local sites.

"The basic plan is to collect and propagate local and distant species, genotype them to test their relatedness and test their performance in a wide variety of local habitats. We have identified eight widespread wetland species that grow in the Georgia Piedmont and can be propagated by simple division. Extensive DNA sequence of these species or close relatives, soon to be published by others, should let us develop PCR-based methods to estimate the genetic relatedness of these plants. Then we can ask if any differences in performance can be explained by where they came from or by their genetic relatedness. Students learn a wide variety of techniques while doing some real science," said Glenn.

The first class has been well received by students. In appreciation, the 2008 class gave Glenn the book, *Field Guide to the Rare Plants of Georgia* by Linda Chafin (1988 PBIO grad) with inscriptions written in the inside cover of the book, such as: "Thanks Dr. Galau, this was a great class!," "Thanks for a fun semester. Go plants!" and "We wanted to give you a little something to show our appreciation for your great teaching and the class experience." Now in its eighth semester, PBIO (BIOL) 3660L continues to be a very popular course.

Visit www.wetlandbiology.net for more information on Glenn's class.

Sweet Roles in Plant Biology

The CCRC-PBIO Connection

After twenty-six years the relationship between the Plant Biology Department (PBIO) and the Complex Carbohydrate Research Center (CCRC) is still as strong as a plant cell wall. The CCRC/PBIO team is composed of a dynamic group of researchers, many of whom study plant cell wall development and structure. PBIO is the home department for faculty members Michael Hahn and Maor Bar-Peled even though their offices and labs are located two miles away in the CCRC building.

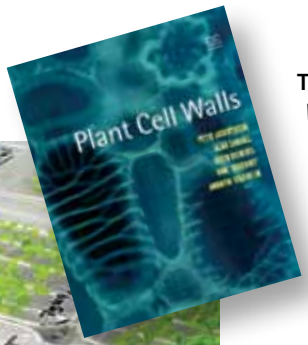
Michael Hahn, a professor of Plant Biology, focuses on glucan-associated signal transduction in legumes and immunological studies of plant cell walls and Maor Bar-Peled, an associate professor of Plant Biology is working in biofuel production, plant cell biology and development.

Furthering the relationship are PBIO adjunct professors and plant biochemists, Alan Darvill and Debra Mohnen. Alan is the director of the CCRC, and a Regents Professor of Biochemistry and Molecular Biology. His research emphasis is on the structure and function of the noncellulosic polysaccharides of plant primary cell walls. Deb's research focuses on understanding the biosynthetic pathways in making pectin, a polysaccharide that is used for everything from jams to anticancer treatments.

Michael Hahn, Maor Bar-Peled, Alan Darvill and Debra Mohnen are the core of the CCRC - Plant Biology connection.

Deb said, "I greatly value the Plant Biology Department. From day one I've interacted with the people there at the seminar series, through the Plant Center, and on committees. I love the blend of biochemistry and plant biology and it is incredible having plant biology graduate students like Ann Hao in my lab." For Deb, "the Plant Biology Department is the central part of the core of an immense plant community here at UGA. The Plant Center retreats allow us to have tight interactions with each other and there is such an increased breath of knowledge by merging our expertise and viewpoints."

Alan was codirector of the CCRC for many years with Peter Albersheim and became the sole director several years ago. Alan said, "Peter and I were plant biologists at heart. I've always kept good interactions with the PBIO department heads, Gary Kochert, Mel Fuller, Jim Hamrick, Alan Jaworski, Russell Malmberg and



The new book *Plant Cell Walls* by Peter Albersheim, Alan Darvill, Keith Roberts Ron Sederoff and Andrew Staehelin is available at amazon.com.

In vitro cultures of *Arabidopsis thaliana* seedlings. *Arabidopsis* is widely used as a model organism in plant biology to study the cell wall structure.

Michelle Momany. Also, I've co-taught Intro Biology with PBIO faculty Russ, Sue Wessler and John Burke." Last fall he taught an Intro Biology class for honors students. "After a tour of the new CCRC building the students referred to it as 'the sugar shack,'" said Alan.

Alan and Deb are also focus area leads of the Department of Energy's BioEnergy Science Center (BESC), a national multi-institutional team that includes several UGA departments that is seeking a common goal of elucidating ways to completely convert lignocellulosic biomass to biofuel.

During the past several years Michael, Maor, Alan and Deb's labs have been working on projects related to converting biomass to biofuels that greatly impact our nation's potential green energy source. Maor said, "In principle, the idea is to bioconvert biomass (e.g. sugars released from plant cell walls) into ethanol. The major hurdle the industry encounters is that the wall is recalcitrant, and currently it is not cost effective for microbial enzymes to degrade the 'wood' (lignocellulose) into individual sugars that can be fermented to fuel."

Deb said, "The BESC is critical for the nation. In the long run we've got to tackle the development of a sustainable, renewable bioenergy, biofuel source. It is an economic necessity."

Visit www.ccrc.uga.edu and bioenergy center.org for more information about the CCRC and the BESC.

DONOR NEWS

Dr. Yates' Generous Planned Gift to Benefit Travel Award

Dr. Ida Yates, wife of our late department head Alan J. Jaworski, recently made a $50,000.00 bequest commitment to Plant Biology through the Planned Giving department at the Arch/UGA Foundation. Ida retired in 2009 from the USDA where she worked for 34 years as a research plant physiologist focused on plant-fungal interactions. She was also an adjunct faculty member in the Plant Biology Department doing collaborative research with Alan on corn plants and on pecan trees with Darrell Sparks in Horticulture. Since her retirement she has traveled to China, Australia and Bali, and hopes to visit the Tuscany region of Italy in the near future. She is a dedicated supporter of our department and her generous gift will be used to benefit the Jaworski Travel Award that honors her late husband Alan J. Jaworski. Ida has requested that the name Jaworski Travel Award be changed to the Alan Jaworski and Ida Yates Travel Award, once her will is settled and the gift comes to the department. Her gift is an important and generous way, beyond her lifetime, of supporting the future of the department. We are all grateful to Ida for making a planned gift to the department.

Q&A

Snarly Darley? You bet!

Marshall Darley snarls at retirement and applauds his former student, Gerry Plumley

Interviewed by Beth Richardson

An early photo of Marshall Darley in the lab working with algal cultures.

Carla Ingram and Marshall Darley share a moment at Sue Wessler's retirement symposium in June 2010.

Q You retired in May 2006 but you've never stopped teaching, mentoring and helping others. What classes, labs and faculty do you continue to assist?

A I co-teach Biology of Protists spring semesters with Mark Farmer and I work with the prep staff and graduate teaching assistants in the introductory and organismal biology labs (BIOL 1104L, BIOL 1108L). I enjoy continuing to learn about algae and other protists, especially their phylogeny which has undergone phenomenal progress since I first taught Biology of Algae with Gary Kochert in 1971; it's been an exciting time to be a phycologist/protistologist. I have coauthored the inquiry-based, writing-intensive lab manuals used in BIOL 1104L and BIOL 1108L, so I have an interest in implementing and helping to improve them. I am pleased that several colleagues have asked me to sit in on their lectures and provide feedback. I feel very fortunate that I am still able to contribute to teaching and learning in our department and in the Division of Biological Sciences.

Q Years ago you made a shift from doing research and teaching to strictly teaching (award-winning teaching). The emphasis on and support for biology education at the undergraduate level seems to have become a strong focus for our department. Would you agree?

A Yes, I agree! Under the leadership of Mel Fuller (department head, 1968-73), we were one of the first departments at UGA to institute peer evaluation of faculty teaching. In the mid 1990s, graduate students Adrienne Edwards and Rob Alba introduced me to the scholarship of teaching (until then I had just done what seemed to work) and significantly advanced the culture of teaching and learning in our department. Their contributions were recognized when they became the first two recipients of the Wilbur Duncan Award. In 1996, Adrienne and I taught our departmental section of UGA's teaching seminar (now GRSC 7770) for the first time. When the faculty discusses qualifications of new hires, their ability to teach well is now a significant part of the discussion. When I attended my first ABLE conference (Association for Biology Laboratory Education) in 2000, I realized that I was having conversations about teaching that I rarely had with faculty colleagues on campus; now I frequently have such conversations. Our department's reputation for support of teaching is illustrated by the fact that three of the four tenure track biology educators in the division have chosen Plant Biology as their home department. The very existence of such positions at UGA is a huge advance in UGA's support of teaching and learning.

Q In this article we are also featuring your former graduate student Gerry Plumley. He is now the deputy director, director of education and a senior scientist at the Bermuda Institute of Ocean Sciences. What thoughts go through your head when you hear about the successes of your former graduate and undergraduate students?

A I remember (painfully) that directing graduate students and their research was not one of my strengths. Those who did complete their degrees under my direction did so largely on their own initiative and motivation. However, I'd like to think that I had some influence on the teaching careers of both my doctoral students, Gerry Plumley and Steve Shimmel; I applaud their success.

Q If you had one wish for the PBIO department, what would it be?

A I would hope that the department would continue to be the cooperative, collegial, supportive and diverse department that I have always known. I would also like to see the department and division make a major effort to provide additional teacher training for our graduate laboratory assistants in the form of week-long workshops.

Meet Gerry Plumley

Q I understand that you did your graduate work with Marshall Darley and that Gregory Schmidt was also a mentor. Tell me about your experience working with Marshall and Gregory.

A I worked for two years as a technician on Sapelo Island after obtaining my B.S. in 1973. After finishing my M.S., I came to UGA to work with Marshall. I was hooked on diatoms and wanted to continue fieldwork on Sapelo. We spent summers on Sapelo doing transplant experiments. It was about this time that I realized how much my interests had shifted from field work/ecology to cellular and molecular physiology. Marshall encouraged me to pursue work related to the diatom cell division cycle, based in part on the type of work that he had done for his Ph.D., and in part based on my years of work in the salt marshes of Georgia. Marshall was a unique combination of hands-on/hands-off advisor. I had a chemostat setup in our lab and soon started displaying cell cycle data on a nearby table. Marshall would never comment about the data until I had taken the time to condense/compress and analyze the data and then write up a description of what I thought was going on. That is when Marshall would pounce. He had been watching the data all along and was waiting for me to decide what it meant. My conclusions were not always the same as Marshall's. He was more frequently correct than I, at least initially, but it was great fun to bounce the data and ideas around. It was at about this time that Marshall started writing his text on *Algal Biology: A Physiological Approach*. I think the hours that Marshall and I spent discussing topics for this book shaped my academic future as much as any single event at least until I got to know Gregory Schmidt. Greg was in the office/lab beside Marshall's when he first arrived at UGA. I had become interested in the role of Rubisco as a marker (and potential storage compound) of nitrogen-mediated cell division. I gradually shifted my time/energy from Marshall's lab to Gregory's lab and finished my dissertation with elements of work from both labs.

Above: Gerry Plumley in his lab at BIOS holds a flask of algae.

Left: Gerry (with glassware) in 1982 at fellow graduate student Wilma Lingle's wedding.

Q As the Director of Education at the Bermuda Institute of Ocean Sciences (BIOS), is teaching a big part of your program?

A BIOS is a small institute with a fairly substantial teaching component to its overall research mission. We have Ph.D. programs with Princeton in the U.S. and Southampton in the UK. We teach undergraduate programs with URI and Roger Williams University. We teach a Partnership for Observations of the Global Ocean (POGO) program that trains 10 students from 10 developing countries for 10 months in observational oceanography. We have internship programs with NSF-REU and other universities too numerous to mention. My role is somewhere between that of a department head, the admissions officer, the dean, and full-time recruitment officer. I teach periodically, but mostly do administrative work, as I am also deputy director of the station and try to keep my research program active (I still have a NSF research grant, a NSF REU grant, and two small grants from private foundations for algal biofuels).

Q Does your current research specialization reflect heavily on your studies and research at UGA?

A My current work is very much influenced by my days at UGA. I still love diatoms and have cultures of them in my lab here in Bermuda, as they are excellent sources of lipids that can be used for biofuels—plus they are still beautiful to look at under the scope. I still ask ecologically important questions and try to answer these questions using molecular and/or biochemical tools. In Bermuda we are in the process of setting up outdoor containers for biofuel research and have talked one of the golf courses into allowing us to use one of their ponds to grow algae for biofuels.

Q When we all stop by BIOS, will you give us a tour?

A I will definitely give UGA-associated folks a tour of BIOS. It's a great place to visit. Bring a class or group.

NEWS BRIEFS

Will Rogers (center) was recognized at the Franklin College Staff Awards event by Dean **Garnett Stokes** (rt) and his boss, Associate Dean **Russell Malmberg**.

PBIO department head **Michelle Momany**, bid a tearful goodbye to **Carla Ingram** (rt) at her retirement party. Carla retired in June with thirty-two years of service.

Sue Wessler and **Becky Sharitz** retired from UGA. They're seen unwrapping their gifts from their fellow faculty members at their retirement dinner party.

Joann Davis retired with forty-three years of service to UGA. Best wishes Joann!

Cathy Utley is a new staff member. She runs the dishwashing and autoclaving facility.

Rick Lankau is a new faculty member working on the ecology of plants and fungi.

Stephanie Chirello is a new staff member working in the front office for the head of the department.

Kevin Tarner is a new staff member working in the greenhouse.

HERBARIUM NEWS

LAURA LUKAS

We welcomed new collections manager, **Laura Lukas**, in late September 2010. Laura is an accomplished botanist in both the field and museum: she was a curatorial intern at Harvard University Herbarium and worked this past summer for a southeastern consulting firm conducting floristic surveys for environmental evaluation. Laura is currently completing her M.S. degree in taxonomy at the University of Wyoming. We are very fortunate to have such a qualified collections manager.

Other news concerning the Herbarium: I was awarded a Biological Research Collections grant from NSF. The GA Herbarium (260,000 specimens) and the Herbarium at Valdosta State University (VSC; 65,000 specimens), curated by Dr. Richard Carter, will collaborate on an effort to complete an on-line GA-VSC Atlas linked to digital specimen images and label data, while providing collections support and student training.

—Wendy B. Zomlefer, Director of the GA Herbarium


BOWSHER


DONG


GEVAERT


KANIZAY


MASON


MILTON


OAKLEY


SHIRK


SUGIYAMA

GRADUATE STUDENT AWARDS

Bowsher, Alan - *Donovan Lab*
Graduate School Presidential Fellowship, 2010-11

Couto-Rodríguez, Mara - *Momany Lab*
Alfred P. Sloan Minority Scholarship Award, 2010

Deen, Cecile - *Chang Lab*
Southern Appalachian Botanical Society Earl Core Student Research Award, 2010; PBGSA Research Assistance Award 2010

Dong, Ling - *Leebens-Mack Lab*
Departmental Palfrey Small Grant, 2010

Ellis, Nate - *Dawe Lab*
2nd Place, PBIO Graduate Student Symposium, 2010

Gevaert, Scott - *Donovan Lab*
Outstanding Teaching Assistant, 2010; Departmental Palfrey Small Grant, 2010; 2010-11 Future Faculty Program; Graduate School Dissertation Completion Award 2010-11

Graham, Chris - *Peterson Lab*
Departmental Palfrey Small Grant, 2010; OTS Graduate Fellowship Award, 2010

Kanizay, Lisa - *Dawe Lab*
Graduate School Presidential Fellowship 2010-11, 3rd Place; PBIO Graduate Student Symposium, 2010

Lynch, Patrick - *Zomlefer lab*
Departmental Palfrey Small Grant, 2010; 1st Place, PBIO Graduate Student Symposium, 2010

Mason, Chase - *Donovan Lab*
Graduate School Assistantship, 2010-11

McAssey, Edward - *Burke Lab*
Graduate School Assistantship, 2010-11

McCarthy, Ryan - *Ye Lab*
Departmental Palfrey Small Grant, 2010

McKain, Michael - *Leebens-Mack Lab*
Outstanding Teaching Assistant, 2011

Milton, Ethan - *Donovan Lab*
Departmental Palfrey Small Grant, 2010; Alan Jaworski Student Travel Award, 2010

Oakley, Clint - *Schmidt Lab*
3 year EPA STAR Fellowship, 2010; 2nd Place, PBIO Graduate Student Symposium, 2010

Pearl, Stephanie - *Burke Lab*
Graduate School Travel Award 2010; 3rd Place, PBIO Graduate Student Symposium, 2010

Prevost, Luanna - *Peterson Lab*
Selected for the 2009-2010 Graduate School Emerging Leaders Program
Wilbur Duncan Award for Outstanding PBIO Graduate Student
Departmental Palfrey Small Grant, 2010

Rentsch, Jeremy - *Leebens-Mack Lab*
1st Place, PBIO Graduate Student Symposium, 2010

Rodríguez, Yainitza - *Momany Lab*
GRSC 7770 Teaching Assistantship, 2010; Outstanding Teaching Assistant, 2011

Shirk, Rebecca - *Hamrick Lab*
NSF GRFP Fellowship, 2009-2012; Departmental Palfrey Small Grant, 2010

Snyder, Luke - *Peterson Lab*
Outstanding Teaching Assistant, 2011

Sugiyama, Anna - *Peterson Lab*
Haines Family Field Botany Award, 2010; Outstanding Teaching Assistant, 2010; PBGSA Research Assistance Award, 2010

RECOGNITION

Lisa Donovan presented **Luanna Prevost** with the 2010 Wilbur Duncan Award for Outstanding PBIO Graduate Student.

Congratulations to **Haibao Tang**. Haibao completed his work in Andy Paterson's lab in December 2009 and was one of only three UGA grad students to receive the 2011 Robert C. Anderson Memorial Award for outstanding research at UGA. It is given to recent Ph.D.s or immediately after graduating from UGA and named for the late Robert C. Anderson, who served as the UGA vice president for research and president of the UGA Research Foundation, Inc. Haibao is currently a post-doctoral researcher in the Department of Plant and Microbial Biology at the University of California, Berkeley.

Mara Couto-Rodríguez, a graduate student in the Momany lab, received the Alfred P. Sloan Award. This is a one time award intended to support underrepresented minority students who are beginning their doctoral work in engineering, natural science and mathematics. The award can be used to cover any type of expenses the student needs, including a stipend. Congratulations Mara!

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Dogwood Drawings: Wendy Zomlefer, *Guide to Flowering Plant Families.* The UNC Press.

ALUMS—Let us know what you're up to these days. Email beth@plantbio.uga.edu

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