



Department of Botany

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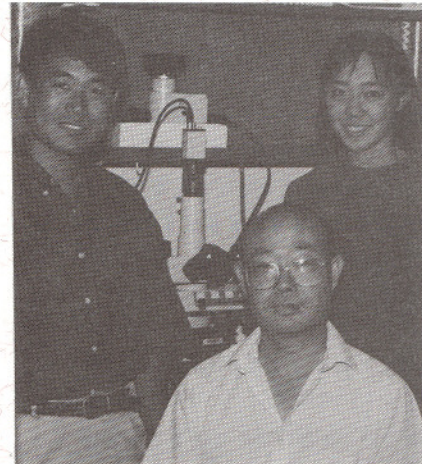
## Macromolecules and Plasmodesmata – A Moving Story

The branch of science with the most interesting gadgets must be cell biology. One of the newest members of the Botany faculty, plant cell biologist Dr. Biao Ding, has a fascinating array of research tools, ranging from fluorescence microscopy and immunological techniques, as well as digitization and quantitation of cell images. With these he studies the cell-to-cell movement of nucleic acids and proteins through plasmodesmata. Visible only in an elec-

tron microscope, plasmodesmata are cytoplasmic strands that connect plant cells with their neighbors. A typical root or leaf cell may have as many as 5000 plasmodesmata linking it to adjacent cells.

As a post-doctoral student in Dr. Bill Lucas's lab at the University of California at Davis, Biao helped demonstrate for the first time that plasmodesmata could serve as pathways for the movement of viruses within plant tissue. Following this important discovery, Biao found that the protein *knotted1*, a transcription factor that regulates gene expression, could also cross plasmodesmata. This raises the possibility that cell-to-cell movement of proteins could be important in plant morphogenesis.

His current research, funded by a two-year grant from USDA, focuses on the plasmodesmatal movement of viroids, which are small RNA molecules responsible for such disorders as potato spindle tuber disease. Biao's first post-doc, Young-Min Woo, joins him this fall from the University of Minnesota to work on the project. Also in his lab is M.S. student Asuka Itaya, whose work on cucumber mosaic virus movement is supported by the S. R. Noble Foundation. Biao has also given five undergraduates the opportunity to work on his research projects.



Dr. Biao Ding (center) with Dr. Young-Min Woo (left) and Asuka Itaya.

Biao's work is recognized internationally. He was an invited speaker at a plasmodesmata workshop in Israel in 1996, and went to Germany this October to present his latest results at a symposium on cell differentiation in vascular plants. In addition to research, Biao also finds time to teach plant anatomy, cell and molecular biology, and microtechnique. Unfortunately, between his work schedule and family life, he has had to cut back on hobbies such as playing the piano. His wife Yan will teach an Extension course in introductory Chinese next spring. Their son Arthur is 3, and he now has a sister, Adeline, who is one.

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*Bluestem* is published annually to inform alumni, faculty and friends about the issues, activities, and news of the Botany Department.

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## Dissertation Defense - Egyptian Style

International travel teaches you that things we do in America are done a bit differently elsewhere. I was reminded of this on a trip last June to Egypt for the dissertation defense of Eman Basha. Eman, under the sponsorship of the Egyptian Cultural Bureau, had conducted her Ph.D. research in my lab at OSU from 1993-1996, comparing the expression of heat shock proteins in American and Egyptian wheat cultivars. She then returned to Egypt and wrote her dissertation at her home school, Tanta University in Tanta, a city about 100 km north of Cairo.

On the morning of the dissertation defense, I and the other committee members donned elegant maroon robes and marched into the examination hall, which was decked in floral bouquets. In attendance were most of the Botany faculty and students, as well as Eman's children, husband, parents, and friends. As each examiner finished his or her questions, the audience

broke into a round of applause. At the end of the exam, Eman's major professor, Dr. M.N. El-Shourbagy, immediately announced, without consulting the other members of the committee, that Eman had passed the exam. This drew more applause from the audience, while the women emitted the high-pitched tongue-twitting that is traditional at celebrations in Arabic countries. The committee then retired for a round of strong Egyptian tea, and adjourned for the day to enjoy an elaborate feast put on by Eman's father, a prominent banker in Tanta.

The trip also gave me a chance to tour the Nile delta, an area that has been under intensive agriculture for over four millenia. One of the staples, winter wheat, had already been harvested. Villagers were gathering the chaff, which is used as fuel and as feed for work animals such as donkeys and water buffaloes. Most of the land was in small plots of cotton and rice, but a remarkable variety of foodstuffs



*Relaxing after the dissertation defense are Eman Basha and son Ahmed, Jim and Charlotte Ownby, and Dr. M.N. El-Shourbagy.*

was being grown, including citrus, chickpeas, garlic, and date palms.

We later returned by train to Cairo, where Dr. Hassan Badr, head of the Botany Department at Tanta, took us on an evening tour of the Cairo Bazaar. The highlight was sitting in a small open air cafe, drinking a popular local drink called sahlab, and comparing how science is done in the U.S. and in Egypt.

## Graduate and Undergraduate Student News



*Janice Hironaka*

For the second year in a row, a student in the Botany Department has received the Outstanding Teaching Assistant award in the College of Arts & Sciences! This year's recipient was **Janice Hironaka**, who teaches two lab sections in Introductory Plant Biology. Janice, who is working on a Ph.D. in Plant Sciences degree in

Bill Henley's lab, is also researching the effects of nitrogen depletion & iron status on photosynthesis in the marine cyanobacteria *Synechococcus* and *Prochlorococcus*. Since there are no oceans around here, she is obliged to ship in seawater from the Atlantic Gulf Stream to grow these critters. Her husband Dan Jones, administrator of the Facility for Advanced Instrumentation at UC-Davis, gave a seminar at OSU in Spring 1997. He also assisted **Gregg Robinson** in charac-

terizing cardiac glycosides in *Asclepias*, part of the M.S. work which Gregg finished in Spring 1997.

Donations by alumni and friends of the department once again enabled graduate students to travel and do research last summer. Two of Dave Meinke's students, **Amy Davis** and **Jia-Qian Wu**, attended the *Arabidopsis* meetings in Madison. **Myong Uk-Kwon** presented her work on the movement of *Spiroplasma citri* in leafhoppers at the American Phytopathological

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Society meeting in Rochester, NY, while **Steve Thompson** conducted field work on how mowing affects the vegetational composition of a prairie community. Other graduate students whose field work was supported include **Sophonia Roe**, who is doing a vegetational survey of the Crosstimbers area near Keystone Lake; **Sonia Jaiswal**, who is studying the effects of fire on the population biology of Pale Prairie Coneflower, *Echinacea pallida*, at the Tallgrass Prairie Preserve; and **Holly Beck**, who is using ground beetles (family Carabidae) as indicators of grazing intensity in the semi-arid grasslands of southeast Arizona. Holly was also recently announced as a winner of the prestigious Forrest Shreve Award for Desert Research, which will provide \$1000 to support her work.

A student who deserves special mention is **Chris Sellers**, a Botany major who will be a senior this year. Last spring Chris, under the tutelage of Dr. Anne Cross, did a research project on soil nutrients under blackjack oak, cedar, and shrubs at the MacPherson Preserve west of town. This last summer he was awarded a \$1000 fellowship by Oklahoma Partners for Biological Sciences to continue this work in the desert grasslands at Dr. Cross's research site, the Research Ranch near Elgin, Arizona.

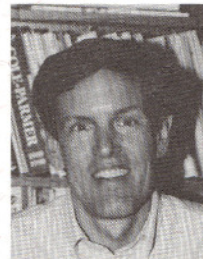
## Faculty Notes



Dr. Palmer

Among the year's highlights for community ecologist Dr. **Mike Palmer** was his election as chairman of the North American Section of the International Association of Vegetation Science. In August, Mike gave the Plenary Lecture at that organization's Annual Symposium, held in Budweis, the Czech Republic. He also instituted a monitoring scheme for the vegetation of the Tallgrass Prairie Preserve, and spent 10 days in July resurveying a forest in Minnesota that had been devastated by a windstorm in 1983.

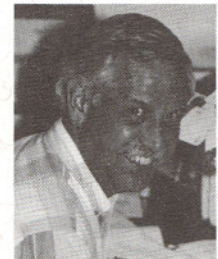
Dr. **Dave Meinke**, whose work on the developmental genetics of *Arabidopsis* was featured in last year's *Bluestem*, enjoyed another productive year of research. Two major



Dr. Meinke

grants came his way, one for \$315,000 from NSF and another from Novartis Biotechnology for \$295,000. Dave, who is still chair of the Science Steering Committee for the multinational Arabidopsis Genome Research Project, also found time to present no less than seven seminars and invited lectures last year. The pace continues this year, highlighted by a workshop in Madrid and a lecture in Singapore.

Last spring was a hectic one for plant taxonomist Dr. **Ron Tyrl**: four graduate students under his supervision finished their M.S. or Ph.D. work. Then Ron and his wife Linda hopped a plane for England, where they will live for a year while Ron completes his third sabbatical at Kew Royal Botanical Gardens outside London. He will spend most of his time using Kew's herbarium and extensive library to work on the Grass Flora of Oklahoma and other writing projects.



Dr. Tyrl

## New Faces in Botany



Patty Smith

**Smith**, who received her Ph.D. under Jim Estes at the University of

Ron Tyrl's sabbatical left some big shoes to fill, figuratively speaking of course. Fortunately, the Botany Department found just the person. **Patty**

Oklahoma last summer, is teaching Field Botany and Plant Diversity this year and curates the Herbarium. Patty knows the plant communities of Oklahoma quite well, having carried out her research on the phylogeny and biogeography of the sandreedgrass *Calamovilfa*. In addition to the plains, her research took her from the Great Lakes to Florida.

This is a homecoming of sorts for Patty, who was born in Stillwater, although she grew up in the Texas panhandle. Her husband Kent teaches at Oklahoma City Community College. When not botanizing, she enjoys gardening and also painting, specializing in watercolors & acrylic depictions of wildflowers and Native American scenes.

Continued on page 4

*New Faces Continued*

Joining us for a year as Visiting Scientist is Dr. **Thomas Wohlgemuth**, who is working with Mike Palmer to establish the validity of remote sensing data on field plot diversity in the Tallgrass Prairie Preserve. Tom received his Ph.D. in 1996 in the Department of



Tom  
Wohlgemuth

Geobotanik at Bern, Switzerland. He has also conducted an inventory of the regional distribution of 2,500 plants in Switzerland, which even in such a small country was a major project.

Along with wife Monika, son Lukas, 6, and daughter Eva, 4, Tom has enjoyed traveling in the U.S., especially the West. He reports being especially impressed by the Sonoran desert in Arizona, but the rest of the family liked the Colorado Rockies more because it reminded them of home.



José Ramón  
Arévalo

**José Ramón Arévalo**, who is working on a Ph.D. degree at the University of La Laguna on Tenerife (Canary Is.), came to Mike Palmer's lab in August 1996.

Supported by the European Community's Forest Restoration Project, José is using Mike's expertise to analyze data for his dissertation. He has also assisted Mike with contract work at the Tallgrass Prairie Preserve and a forest succession project in Minnesota. When not in the lab, José can be found playing on OSU's rugby team, and he has the scars to prove it.

## Alumni notes and news

**Dale M. J. Mueller** (MS in 1964 with Jerry Crockett) received his Ph.D. at UC-Berkeley. After a year's post-doc at Minnesota, he joined the Department of Biology at Texas A&M where he is currently Associate Professor. Dale has continued to work on mosses, and has served as the eighth Editor of *The Bryologist*, and also Secretary-Treasurer of the American Bryological and Lichenological Society. He and wife Eleanor have two children and one grandchild.

**George Parker** (MS in 1967 with Jerry Crockett) received his PhD in 1970 at Michigan State and has been in Department of Forestry and Natural Resources at Purdue since then. He has enjoyed sabbaticals at Georgia and The Nature Conservancy, and is currently on the road collecting material for a book on eastern hardwood forests. George and wife Mary Lee have been married 33 years, with son Ryan in graduate school at Indiana U. and daughter Robin now a junior at Purdue.

**Jack W. Stanford** (Ph.D in 1971 with U.T. Waterfall), who was on the faculty of Howard Payne University prior to his graduate work at OSU, returned as Associate Professor and is currently Head of the Department of Biology there, having completed 31 years of service. His wife Gilda teaches elementary school, and sons David and Steven are both Certified Public Accountants.

**David Alan Davis** (BS in Botany in 1979) strayed from the botanical path and received his MD at the University of Oklahoma in 1983. After a year's internship at the University of Arkansas, he entered the Navy and became a Naval Flight Surgeon in 1987. He is currently Head of Ophthalmology at the Naval Hospital in Jacksonville, FL and Clinical Instructor of Ophthalmology at the University of Florida. He and wife Anita have three children, Elissa, 14, Glen, 11, and Shannon, who is 3.

**Steve Evans** (MS in 1982 with Paul Richardson) taught high school in Oklahoma, Kansas, and Texas for 9 years. He is currently Park Naturalist at Lake Tenkiller and Greenleaf State Parks, where he conducts wildflower and tree identification walks as well as astronomy shows. He and wife Karla (BS in Education in 1979) have three daughters, Rebecca, 15, Jenny, 14, and Amy 12.

**Marty Matlock** (MS in 1989 with Jim Ownby) completed his Ph.D. in Biosystems Engineering at OSU with Dan Storm in 1996. He is currently Assistant Professor in the Department of Agricultural Engineering at Texas A&M. His research focuses on watershed management and application of ecological principles to the design and implementation of engineering processes. Marty and his wife **Stephanie Foster** (BS in Biology, 1987) are both busy looking after daughter Sierra, who is two now.

**Kerry Salter-Rowland** (BS in Botany in 1994) married Brian Rowland in 1996. She currently works for the city of Tulsa as a laboratory technician in the Public Works Department. Kerry is helping organize the Southwestern Regional Conference of the American Chemical Society, scheduled for October in Tulsa.

## Becky Johnson Returns to Botany Department

The Botany Department now has nine faculty members with the return of Becky Johnson. Becky, who left to become Dean of Undergraduate Studies and Director of Admissions in 1992, has rejoined the Department and will resume her research and teaching activities. The latter includes a course in the Honors Program, a Survey of Human Disease, and graduate level tissue culture course. Becky will also offer a new upper-division course in Ethnobotany next Spring. This promises to be a very popular course, considering current interest in the knowledge that indigenous

people have about the culture and use of plants. Ethnobotany will focus on relationships between traditional peoples and plants. Topics will include paleoethnobotany and the origin of agriculture, traditional agricultural practices, herbal medicine, and the ritual uses of plant materials.



*Dr. Becky Johnson*

## Help Keep the Botany Department Green

Yes, a potted plant would be nice, but even better would be a generous donation to the McPherson Fund [OSU Foundation Account # 22 5090] or to the general Botany Department Fund [OSU Foundation Account # 22 3840]. Readers of the Bluestem are probably aware that we use these funds to assist graduate students in

their research and support travel to scientific meetings. As Editor and Department Head, It is very gratifying when students express their appreciation for this support, and I would like to pass along their thanks to those who have generously supported us in the past. Please send donations of any amount to either address below:



Botany Department, Oklahoma State University,  
104 Life Sciences East, Stillwater, OK 74078-3013

or

OSU Foundation, Oklahoma State University,  
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## Alumni information requested

The department is currently updating information from alumni. Please take a moment to complete the questionnaire and return it to the address above.

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*achievements and awards*

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*name*

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*home address*

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*current professional position*

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*additional education/degrees*

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