

IN VIVO

Newsletter of the University of Tennessee Division of Biology

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APRIL - MAY 2003

From the Head



Greetings from the Division. I am writing as I sit in a very lovely room in Fall Creek Falls Inn and State Park waiting for a little time to pass until the start of a

conference sponsored by the Center of Excellence for Science and Mathematics Education located at The University of Tennessee Martin. The subject of the conference is aptly described by its title: 2003 Statewide Conference on School and College Science and Mathematics Education and Teacher Preparation.

The conference will last for two and a half days and will assemble a set of recommendations concerning a wide variety of problems facing K thru 12 and higher education. My own involvement results from my good fortune to have had the opportunity to be a life long educator at the university level and more recently to have spent the better part of a year participating in the Scholar-in-the-Schools program administered by a very active College of Arts and Sciences Outreach office.

Let me say that this experience has

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McGuyver has nothing on these guys

In July the Biology Service Facility (BSF) will be celebrating 35 years of serving the Division of Biology. Last year alone the BSF responded to 813 requests for service. While many were for instrument repair, several requests involved custom construction and development. This year promises more unusual projects. On the agenda so far are modifications to 15 field greenhouses, construction of Iguana cages, a clean room, and seven major cabinet shop projects.

BSF is not limited to working within the confines of the Division. In the past they have been able to help departments on the Agriculture campus such as Ornamental Horticulture and Landscape Design to the Vet School. Their services are also employed by

several other departments on the main campus including the Student Health Clinic and Geological Sciences.

Completing these projects is a well-organized and competent staff. They often have to work on a shoe-string budget, but are able to design or retrofit whatever they have on hand to meet the needs of the professors and scientists at UT.

The BSF staff is divided into four sections. First is the Administrative section and at the top is Manager **David Pratt**. He is the number one fan of his staff and the camaraderie they share is largely due to his laid-back, yet service-oriented management style. David spends his time visiting the deans and department heads of various departments, over-seeing building renovations, and spot-checking his staff's work. He is well-



Top to bottom / left to right:
Steve Collins, Bob Carr, John Spears, Steve Rickels, Gary Branson, David Pratt, David Kidwell, Donna Dockery, Randy Sims, Jack Owens and Jana Polson

regarded on campus, but especially within the BSF.

Also a part of the Administrative section is **Jana Polson, Donna Dockery, and John Spears**. One of Jana's responsibilities is providing CAD drawings for the technicians and David. As the Administrative Services

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left me with a great deal of respect for the many dedicated teachers to be found in the primary and secondary schools of this country. One of the Division Director's primary responsibilities is to manage the undergraduate Core offerings that are designed to prepare our students for their academic experiences encountered in our upper division offerings. It is my hope that these Core courses will continually be examined for their appropriateness in today's rapidly changing world of biology.

In addition to the four Core offerings the Division also offers a full year (two semesters) non-majors biology series complete with laboratory experience to around 2,000 thousand students each year. This coming fall semester our non-majors will be offered a choice of two approaches to freshman biology for non-majors (Humankind and the Biotic World: Biology 101 and then the spring offering Biology 102). The course goal is "to promote scientific and biological literacy for informed and participatory citizenship." We will be offering our standard "traditionally based" course with its hands on laboratory and lecture approach to half of the approximately 1,200 incoming freshman that sign up each semester.

The other half of those folks will get their biology requirements filled by a course that will differ in its approach by "organizing class sessions around specific issues current in our society. The issues provide the context and vehicle for exploring the biology behind the issue. This provides students with a more compelling reason for engaging the material, and counters the all too common misconception that biology is a discrete entity with no connections to the other domains of human experience. The core biology content that will be explored is consistent with that addressed in our traditional approach. That is, in 101 the content focus will be biological molecules, cells and cell division, and human anatomy and physiology; in 102, biological evolution and diversity, and ecology.

Issues that will focus the exploration include: food and human nutrition,

cancer, stem cell and reproductive cloning, biological weapons, emergence of new communicable diseases, evolution and society, extinction, environmental quality, and global climate change." The preceding quotes come from the writings of **Dr. Stan Guffey**, who currently holds a Lecturer position in the Division. Stan is responsible for developing and presenting the material for the issues-based course.

For this first go around, we will not be changing the laboratory to any significant extent; however, if all goes well we will also extensively modify the accompanying laboratory experience. The rapidity of these changes hinges upon the writing of a new laboratory exercise series as well the availability of funding to support the information technology upgrades needed by our non-science major's laboratory facilities. More about these changes in the upcoming issues of *In Vivo*.

It is always a pleasure to bring good news, so here is the Division's extra special contribution. The 2003 Provost's Honors Banquet was recently held for The University of Tennessee, Knoxville Campus. This is a yearly affair given to recognize employee excellence across all aspects of our campus community. There are several award categories ranging from the naming of the 2003 Torchbearers to recognizing individuals for Extraordinary Community Service. The Division had several of its departmental faculty as well as support staff recognized at this year's banquet.

Two faculty, one full time and one holding a joint appointment in the Division, were awarded Cox Professorships, an award for professional excellence established by **Mr. James R. Cox**, a native Knoxvillean. **Dr. Susan Riechert**, a professor in Ecology and Evolutionary Biology, is nationally and internationally known for her work on spiders and their behavior. She has also received several university awards for her undergraduate teaching as well as funding from the National Science Foundation and the Eisenhower Grant Program to further explore her teaching

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Assistant, she is also the office problem solver. The technicians know that she can get them whatever they need whenever they need it.

Donna, the Senior Data Entry Operator, is the cheerful voice on the phone when one first calls the BSF. She processes the work orders and keeps the customers happy. The staff calls her their "Lucy" because of her disposition. She says, "You ought to be able to laugh where you work."

John, the Material Control Clerk, is referred to as BSF's "lifeline." He is the one who gets the parts and equipment to the technicians when they are needed. Often he has to find such odd items as fishing line, tennis balls and nail polish, but these are all things that help the creative minds in BSF do their job.

The Cabinet Shop has only one member, Cabinetmaker, **Steve Rickels**. He makes laboratory case-work, isolation tables, countertops, and bookcases. He often is involved in demolition as much as renovation and has rebuilt many laboratories for our professors. In his spare time he uses his woodworking skills to make guitars.


The Electronics and Instrumentation Shop is composed of **Steve Collins, Jack Owens** and **David Kidwell**. Steve, Electronics and Instrumentation Shop Supervisor, maintains the control end of centrifuges, spectrometers, x-ray machines and water systems. Jack, Senior Electronic Technician, services the equipment in the lecture rooms and has also been designing measuring devices for Exercise Science. David, Electronic Technician, installed and maintains the video security system for the Animal Facility. He also maintains CO2 incubators and microscopes. He recently retrofitted the controllers of growth chambers that were given to the Division by Maryville College.

Next is the Machine Shop, staffed by **Gary Branson, Randy Sims** and **Bob Carr**. Gary is the Senior Instru-

ment Maker and he has been involved with many unusual projects for the College. For example, he has designed core samplers for EEB, clean rooms and dark boxes for Microbiology, and greenhouses for Oak Ridge National Laboratory.

He is aided by Randy, the Laboratory Machinist, who also provides maintenance service and factory warrantee work for some of the new autoclaves on campus. Bob, the Senior Maintenance Mechanic is new to the team. He is responsible for all refrigeration units and ultra-low freezers.

Very few jobs call for one section alone. Often the BSF staff overlaps duties and collaborates. They can also work as a team on larger projects. For example many of them are involved in the development and renovation of the research and teaching laboratory space at the Botany Field Station in Gatlinburg.

BSF is a shining example of creativity and skill. A needful part of the Division of Biology. 

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**Animal Facility News
by Sally Fridge**

We have had a number of staff changes since our last news. (Last names are left out for the protection of our staff). One of our employees, **Joe**, left to go to a new position over at the veterinary school. This was a step up for him and gives him more experience to take him ever closer to his career goals. While we regret the loss to the facility, we are happy to congratulate him and wish him very well in his new job!

In September 2002, shortly before Joe left, we hired a new animal technician, **Daniel**. Then, in January 2003, we hired two more new animal technicians, **Kimberly** (Kim) and **Anthony** (Tony). Daniel and Tony are

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BioComputing gets needed support

BioComputing, the Division's computer support facility, has experienced tremendous growth in the services offered to their clients. Over the last three years the BioComputing infrastructure has grown from seven to nineteen servers and increased its on-line storage capacity from 2GB to over 750GB. The new Windows 2000 domain based infrastructure has simplified access to the Division's network resources and provides personal, web, and lab volumes for the entire client base.



Karl Boercker, Ron Johnson, Denise Beach and Aaron Reynolds

Another area of growth for BioComputing is in the area of increased support staff. **Ron Johnson** manages the facility as the Computer Systems Specialist and provides primary systems and network adminis-

tration. He is pleased with his staff and especially the addition of a new member, to bring the office to a total of four. He prefers not to compartmentalize the staff by stressing cross-training and dynamic task assignments. However, the remaining three members of BioComputing do have their areas of expertise.

Denise Beach, a Computer Support Specialist, focuses primarily on Lotus Notes administration, Windows 2000 domain user administration, and general office infrastructure.

Additionally Denise is the primary customer relations representative and has various support duties related to hardware, software, and servers.

The other Computer Support Specialist is **Karl Boercker**. He is new to the team and is currently

learning the fundamentals of computer support in a

heterogeneous environment.

Aaron Reynolds, a senior level Computer Support Specialist, is well versed in all aspects of PC and Macintosh support. He spends the majority of his time on the more complex or time-consuming hardware and software related problems. He also insures the smooth operation of five computer laboratories that BioComputing maintains. Aaron and Karl recently began a concentrated professional development program targeting the Solaris and IRIX (UNIX) operating systems. The increase of staff, capacity, and capabilities has enabled BioComputing to address the needs of the Division faculty and staff in a way not seen before. ☞

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Microscopy Facility by John Dunlap

The Microscopy Facility (101 Science and Engineering Building) continues to serve the Division faculty and students, as well as faculty from across campus, the Veterinary School and the Hospital.

As for equipment, the newest is the SEM and it may have been included in a previous note, but I will put it in again just as a reminder that we have it.

A new scanning electron microscope has also been added to the equipment in the Facility. The microscope is a LEO 1525. It is a high resolution scanning microscope capable of working at low voltage. Being able to work at lower voltages is a plus for many samples because it reduces the need to coat samples with gold which can obscure fine detail. The microscope is also equipped with an energy dispersive X-ray spectrometer for determining local element composition of a sample.

The Leica SP2, laser scanning confocal microscope, is continuing to perform well. We have added a live-cell imaging device from BIOPTECHS Inc and dipping objectives for live cell imaging. With this device we can image living cells in culture for extended periods of time.

An Atomic Force Microscope (AFM) will be added to the instrumentation in the Facility in the next couple of months. The microscope was purchased with NSF funds from a multiuser MRI grant developed by **Dr. Gary Sayler** from the Center for Environmental Biotechnology. The AFM is a closed-loop, fully-automated MFP-3D system from Asylum Instruments and should be in place and operational within a few months.

For those not familiar with the Facilities we have, I encourage you to get in touch with me. I will be happy to discuss our capabilities and how they might contribute to your project. ☞

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In Vivo

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Neyland Biology Annex—"Down by the River"

by Patricia Cox

The Neyland Biology Annex houses the biology labs for non-majors biology, biodiversity, cell biology, genetics and microbiology. More than 2,500 students pass through our doors every week.



Jennie Allen and Elizabeth McPherson

On the microbiology end of the building, **Jennie Allen** and **Elizabeth McPherson** prepare the labs for the microbiology students. Elizabeth has a master's degree from UT in Microbiology and was a student of **Dr. Robert Moore**. In addition to her duties with the micro labs, she also teaches the Introductory Microbiology lecture. Jennie has been

working as the lab and media preparator for the last 15 years.

On the Biology end of the building, I am the Core Coordinator of the Biology Program. I am assisted by **Jan Hudson**, the lab coordinator, **Russ Patterson**, the genetic lab preparator, and **Zeola Miller**, the principal secretary.

Jan has a B.S. degree in Applied Biology from UT and has been working in the Division for 28 years. She is the coordinator for the "Friends of Biology" Golf Tournament that takes place every spring. This event raises money for graduate student travel.

Jan's duties are to coordinate the labs for the biology courses, with special emphasis on Cell Biology.

Russ has a B.S. degree in Zoology from UT and is currently working

part-time on a Master's degree in BCMB. He maintains the genetics lab and has wonderful organizational skills.


Zeola is the newest member of our department. She has a B.A. degree in Psychology from Chicago State University and tries her best to keep the graduate students, instructors, and staff in line.

These biology courses are dependent on high quality graduate teaching assistants to teach the laboratories.



Zeola Miller, Jan Hudson, Russ Patterson and Pat Cox

GTA's are provided to these courses from the four departments of the division. For our program to continue, it is important that graduate students that

are excited about teaching, as well as doing research, be recruited for Biology. 

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ANIMAL FACILITY, from page 3

recent high school graduates while Kim graduated in December 2002 with a B.S. in animal science. She also had completed the Assistant Laboratory Animal Technician course offered by the Office of Lab Animal Care before coming to work with us. We were very glad to get someone with her background.

Daniel and Tony are doing well, also, displaying the absolutely necessary characteristics of self-motivation, responsibility, integrity, and independence needed to work in the facility. All three of our new employees are very conscientious in their work and are learning quickly. They all fit in well with our existing staff and we are very glad to have them on board. We also want to congratulate **Melissa**, a lab animal technician, on the birth of her bouncing baby boy, **Devon Christopher**, born January 27th. Sadly, we


have just learned that Melissa is leaving us in the near future. We will really miss her and her delightful sense of humor but we wish her and Devon well.

We are getting ready for our Association for Assessment and Accreditation of Laboratory Animal Care (AAALAC) site visit, tentatively scheduled to occur in May 2003. We have always done well with these visits and everybody is doing their part to ensure that we do well, once again. We look forward to showing them what a terrific place we provide for our furry (and some not so furry) charges.

We were happy to welcome some new investigators and their projects to the facility. **Dr. Sundar Venkatchalam** and his lab came in September from Baylor while **Dr. Pam Small** and her lab joined us in January. **Dr. Zemel** from Nutrition brought animals to us in

September. His animals took the vote for the prettiest little mice in the facility. We enjoy looking at them because they have an unusual color pattern, much different than we normally see here.

Currently, we are refurbishing our Xenopus frog caging system with the assistance of the ever-helpful Biology Service Facility. They are going to replace all of the PVC pipes and hosing plus make it possible for us to regularly flush the pipes and hose them out with chlorinated water.

Our goal is to constantly strive to improve all our procedures and to bring about improvements within the facility so that we provide an environment conducive to the health and well-being of the animals, a necessity for good research. 

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Sequencing is his second life

Joseph May is the consummate businessman and the one responsible for the growth and development of the Molecular Biology Resonance Facility (MBRF). However, the road to Manager of the MBRF was a long one.



Joe is from Elizabethton in upper East Tennessee. There he grew up in a family of doctors and nurses. Everyone in his family, from parents, brothers, aunts and uncles is in the medical field. He even married an R.N. He went off to East Tennessee State University in 1978 with the plan to go into medical school.

Joe likens himself to the “black sheep of the family” and soon found that although he liked molecular biology classes, he did not want to be a doctor. At that same time, his father was considering retiring and selling the family

apple orchard. Joe talked his family into letting him manage the 10,000 tree farm. For 20 years Joe lived his “first life,” as he calls it, on the farm making it a viable enterprise.

However, he began to lose the battle against fungus, insects and the market. At the same time he was watching with great interest the work on the Human Genome Project and knew that disease-resistant hybrid trees could be possible, but felt


far removed from the laboratory setting.

Finally, the decision was made to sell the farm and Joe decided to go back to school and start work on his “second life,” that of molecular biology. Sparked by his apple tree troubles on the farm, Joe immersed himself with his work in **Dr. Gary Stacey's** laboratory in the Microbiology department. He found his way into the MBRF with the help of then manager, **Dr. Neil Quigley**. He is working there now on a part time basis as he finished up his degree, which he hopes to complete this year.

Joe's work consists of sequencing samples from UT researchers as well as outside sources. He works hard to offer a quick turnaround and low cost service. He also offers fragment analysis (RFLP) to those professors who want to use the machines themselves.


He runs more than 100 samples each day, which keeps his main machine, the Applied Biosystems 3100 genetic analyzer, running full-time. It has a 16 capillary array capacity. He still uses the AB 310, which is a single capillary machine. His goal is to keep the MBRF self-sufficient and possibly save enough money to purchase another machine. He does not advertise his services because the facility is running at capacity as it is, but a second machine would greatly help.

Beyond his work with UT faculty are his customers from ORNL and the Agricultural Campus as well as private companies. Joe is currently the only employee of the MBRF and feels even with another machine, he can handle the work load.

Even though he did not enter the medical field, Joe feels at home in the MBRF. Helping others in their research, he has found his niche in life and at UT. 

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JSHS outreach

The Tennessee Junior Science and Humanities Symposium (JSJS) was held February 27 – March 1, 2003 in Knoxville. The JSJS is made up of top-of-their-class high school students in science and mathematics from across Tennessee. This is the first year that they were given an opportunity to tour the UT campus. **Dr. Kenneth McFarland** of Botany took these students and their teachers on a tour of the White Avenue Biology Annex. He was able to show the sixty students and teachers the greenhouses and part of the fish collection. 



Division Alumni

Dr. Ruby Rice Little graduated with two degrees from Botany in 1932 and 1934. She traveled extensively in Central and South America with her husband **Elbert**, who spend 42 years with the U.S. Forest Service U.S.D.A. They are both now retired and living in Beltsville, Maryland.

Dr. William Mengebier graduated in 1953 with a degree from Zoology. He is now a retired professor and Episcopal priest. He remains involved with the local Hospice in Bridgewater, Virginia.


Dr. John Cate IV received his bachelor's degree in Zoology and then graduated from UT College of Medicine in Memphis in 1961. He is now retired from the Medical University of South Carolina. He served as a professor in the Department of Pathology and Laboratory Medicine. He was also the Division Director of Laboratory Medicine and the Section Director of Clinical Chemistry. He now lives on Johns Island, South Carolina.

Dr. William Tietjen completed his degree in Zoology in 1967. He is now an Emeritus Professor of Biology from Georgia Southwestern State University. He also served the University as the Vice President for Academic Affairs and Chair of the Department of Biology. He

is currently involved in aquatic ecology research and teaching of volunteers near his home in Plains, Georgia.

Dr. Isao Yoshimura received his master's degree in Botany in 1967. His major professor was **Dr. Jack Sharp**. He was a researcher at Hattori Botanical Laboratory and recently retired from being a Professor of Biology and President of The Kochi Gakuen College in Kochi, Japan.

Dr. Guy Caldwell received his PhD in **Dr. Jeff Becker's** laboratory in 1995 under the Cell, Molecular and Developmental Biology Program. Dr. Caldwell met his wife **Kim** at UT and they were married and both received their degrees at UT. He is currently an Assistant Professor in the Department of Biological Sciences at the University of Alabama in Tuscaloosa. She is an Adjunct Professor there as well.


In 2001 he was named a Basil O'Connor Scholar of the March of Dimes Birth Defects Foundation for his research into the molecular basis of childhood birth defects of the brain. His laboratory is also one of 11 worldwide that represent the research goals of the Michael J. Fox Foundation for Parkinson's Research. Most recently, he was awarded the NSF Faculty Early Career Development Award. 

independent science research projects. Faculty who have attempted this sort of service know of the patience and dedication as well as personal grace necessary to offer this sort of mentoring.

The final Division awardee received recognition in the category of Extraordinary Service to the University. **Mr. David Pratt**, manages the Biology Service Facility for the Division of Biology, "...a job in which he designs and supervises renovations, designs special tools that are not available commercially, and recruits and manages a highly qualified staff.

Said one nominator: 'The Biology Service Facility is one of our most valuable assets in recruiting and retaining excellent faculty members. Few universities in the country have such a superb ability to support research and teaching. Without David Pratt, it is doubtful that the BSF and its services would exist at all.'" I couldn't have said it better myself. We wish to add our congratulations to these faculty and staff for their continued professional excellence and tireless enthusiasm.

This issue of *In Vivo* marks the third anniversary of its publication and as is traditional, the focus of the issue is the Division's all important support staff and the significant everyday contributions they make towards the teaching and research efforts of the faculty and graduate students. I appreciate the response of those support units that contributed to the content of this edition. I fully realize the extra time and effort required to participate, however, I feel sure that the Division's alumni and friends out in the rest of the world will find the business of your everyday work life interesting.

To our readers scattered far and wide, I hope you are having a pleasant spring season; it's really beautiful here in East Tennessee. Your Academic home would like to hear from you, drop us a line or e-mail and bring us up to date on your life's happenings, perhaps you will make the next edition of *In Vivo*. Cheers, Otto 

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DIRECTOR, from page 2

ideas. And in her "spare" time, with the help of the College of Arts and Sciences Outreach Office, she has developed the "Biology in a Box" program that provides a series of unique learning modules for the primary and secondary schools of Eastern Tennessee.

Dr. Gordon Burghardt, professor of Psychology, holds a joint appointment in the Department of Ecology and Evolutionary Biology. Gordon is a nationally recognized scholar in animal behavior who pioneered the

Black Bear Research Program in the Great Smoky Mountains.

In the category of Extraordinary Community Service, Biology was again honored because of the work of **Dr. Bruce McKee**, Professor and Head of the Department of Biochemistry, Cellular and Molecular Biology. Bruce has a long history of service to the community through his mentoring of high school students. He has provided high school students with his expert guidance as well as laboratory space for their



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IN VIVO

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VOLUME 3, NUMBER 1

APRIL - MAY 2003

A friendly reminder:

The Seventh Annual "Friends of Biology" Golf Tournament

Sponsored by Fisher Scientific

Thursday, May 1, 2003
Centennial of Tennessee Golf Course
Oak Ridge, Tenn.
9:00 am Shotgun Start



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