New Scholarship Honors Dr. George Stanton

The Biology Department is excited and honored to announce the inception of the George E. Stanton Enrichment Fund, to provide awards for students conducting undergraduate research in ecology and evolutionary biology. This fund has been established to honor the life-long dedication of Dr. Stanton to CSU, the College of Science, the Biology Department and the Columbus community.

Dr. Stanton began his career as an Assistant Professor at CSU in 1969. He served the Department of Biology as interim chair for two years, before taking the position of chair in 1982. His vision and passion guided the department until 2003 when he was asked to serve as interim dean of the College of Science. He was later appointed dean and led the college with the same dedication and balanced, thoughtful vision that he used to guide the department. Stanton became VP for Academic Affairs in 2005 and continued to serve CSU as a leader on campus and in the community until his semi-retirement in 2009.

Dr. Stanton's ability to act as an effective administrator, teach a variety of courses, and find time to conduct research and mentor students in their research is admirable. The successful biology international courses are directly related to his ability to embrace new ideas and have the leadership and vision to see the possibilities for integrating international programs into the curriculum.

In addition to his service to the university and community, Dr. Stanton is involved in many outreach programs. His vision, combined with that of Billy Turner (Columbus Water Works), resulted in the creation of Oxbow Meadows Environmental Learning Center in 1995. He has been an active member of many local boards.

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Scholarship honoree George Stanton continues to share his enthusiasm for biology with students after 41 years at CSU

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Students travelled to the rainforest of Costa Rica in 2008. See page 6 for more photos from study abroad experiences.
Faculty & Staff Profiles

Dr. Julie Ballenger - Professor; Dept. Chair
- Joined CSU in 1995 (Ph.D. Miami University 1992)
- Interests: Botany, Plant Taxonomy, Molecular phylogenetics of plants.
- Current Research: Characterization and conservation of wetland plant communities in the Georgia fall line sand hills.

Dr. John Barone - Associate Professor
- Joined CSU in 2003 (Ph.D. University of Utah 1996)
- Interests: Ecology, Biodiversity, Conservation.
- Current Research: Community ecology and distribution of southeastern prairies; ecology of treeholes; structure of ant communities.

Dr. Bill Birkhead - Professor (semi-retired)
- Joined CSU in 1978 (Ph.D. University of Texas 1968)
- Interests: Vertebrate Biology (esp. natural history).
- Current Research: Long-term study of gopher tortoise burrows; fish host(s) of the purple bankclimber; fish of Fort Benning; vertebrates of Callaway Preserve.

Dr. Kevin Burgess - Assistant Professor
- Joined CSU in 2008 (Ph.D. University of Guelph, Canada 2004)
- Interests: Plant Ecological Genetics, Botany, Conservation Genetics.
- Current Research: Discriminating plant species and population genetics using DNA barcoding.

Dr. John Davis - Associate Professor
- Joined CSU in 2002 (Ph.D. Indiana University - Bloomington 1994)
- Interests: Microbial Biochemistry, Physiology and Genetics of Environmental Microbes.
- Current Research: Pink pigmented facultative methylotrophs; bacteria in pitcher plants; point source of E. coli in regional waterways.

Ms. Joy Davis - Administrative Secretary
- Joined CSU in 1983 (BA Columbus College 1980)

Dr. Monica Frazier - Assistant Professor
- Joined CSU in 2006 (Ph.D. University of Alabama at Birmingham 2001)
- Interests: Use of novel dietary compounds for the treatment of prostate cancer with an emphasis in bone metastasis.
- Current Research: Drug discovery research involving the use of dietary compounds as chemopreventive or chemotherapeutic agents against prostate cancer.

Dr. Harlan Hendricks - Professor
- Joined CSU in 1997 (Ph.D. Virginia Polytechnic Institute and State University 1993)
- Interests: Arthropod Ecology and Evolution, Insect Systematics.
- Current Research: Comparative toxicity of widow spiders in the Chattahoochee Valley.

Dr. Katey Hughes - Associate Professor
- Joined CSU in 2005 (Ph.D. University of Florida 2004)
- Interests: Functional Genomics, Neuroscience, Physiology.
- Current Research: Role of conjugated estrogens in celiac disease and oxidative stress.

Ms. Ely Klar - Lecturer; Laboratory Manager
- Joined CSU in 1996 (M.S. University of Georgia 1986)
- Interests: Anatomy and Physiology, Histology.
- Current Research: Histological assessment of physiological and anatomical change due to environmental impacts.

Dr. Milwood Motley - Associate Professor
- Joined CSU in 2005 (Ph.D. University of Louisville 1983)
- Interests: Medical Microbiology.
- Current Research: Virulence factors of pathogenic fungi; antiviral activity of proteins involved in innate immunity.

Dr. Brian Schwartz - Professor; Assistant Department Chair
- Joined CSU in 1996 (Ph.D. University of Wisconsin-Madison 1992)
- Interests: Genetics and Developmental Biology.
- Current Research: Copper utilization mutants in yeast; sex determination and copper utilization in the fern Ceratoptiris richardii.

Dr. George Stanton, Professor Emeritus
- Joined CSU in 1969 (Ph.D. University of Maine 1969)
- Interests: Aquatic Ecology; Conservation and Ecology of Crayfish; Aquatic Entomology.
- Current Research: Crayfish ecology; aquatic bio-assessment; ecology of decomposition communities.

Dr. Glenn Stokes, Professor
- Interests: Vertebrate Physiological Ecology, Herpetology.
- Current Research: Movement behavior patterns of turtles; cytotoxicity of orthodontic materials.

Mr. Carson Stringfellow - Assistant Professor; Safety Officer
- Joined CSU in 2006 (M.S. Columbus State University 1997)
- Interests: Freshwater Mussel Taxonomy & Ecology.
- Current Research: Freshwater mussel and native crayfish interactions; continued refinement of freshwater mussel classification.

Dr. Jeffrey Zuiderveen - Professor
- Joined CSU in 1994 (Ph.D. Univ. of Kentucky 1994)
- Interests: Aquatic Biology, Ecology and Toxicology.
- Current research: Feminization of male bass by pollutants; gerontogene effects on toxic responses.
Faculty members in the Biology Department believe in the importance of a **hands-on experiential program**. Courses are highlighted by extensive lab and field-based experiments. The philosophy of *'learning by doing'* has been, and will continue to be, a guiding principle in the department. Biology graduates are broadly trained and prepared for employment in a variety of fields or are ready for the challenges of graduate or professional schools.

The **Bachelor of Arts in Biology** major is designed to allow flexibility in the courses selected by students. Students build a program that best fits their goals and future plans by combining the core courses in biology with a minor in another academic discipline or a pre-approved minor equivalent.

Students may select a **BA in Biology with Secondary Education**. This program provides students with the experience and course work required for a degree in biology along with the expertise and pedagogical background to teach grades 6-12.

The **Bachelor of Sciences in Biology** is a more structured and prescribed degree and is most appropriate for students planning to pursue post-graduate studies. The curriculum requires students to develop and complete an independent research project that consists of a proposal, data collection, analysis and presentation of results.

In addition to those students in the BS program who conduct independent research projects, students in the BA and BA Secondary Ed programs have completed research projects as well. Students are encouraged to work with faculty mentors to develop and successfully complete their research. The final degree, no matter whether a BA, BA Secondary Ed or BS, should reflect the experience desired by the student. Students are encouraged to exercise control over the development of their degree program within the limits of the major.

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**Student & Faculty Achievements**

**CSU Student Awards**

Honors Convocation (April) awardees:

- **Biology Education Award** - Katherine Moultrie
- **Cellular & Molecular Biology Award** - Samantha Nieves
- **Organismic Biology Award** - Nakita Burden
- **Ecological & Evolutionary Biology Award** - Amy Schabel
- **George Stanton Biology Award** - Stewart Helton (below)

**CSU Student Employee of the Year** – De’smond Henry

**CSU Faculty Awards**

De’smond Henry is honored as **Student Employee of the Year** by Gina Sheeks (VP for Student Affairs) & President Tim Mescon.

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**Regional Awards**

Association of Southeastern Biologist Annual Meeting, **Southeastern Regional Beta Beta Beta Award winners**:

- **2nd Place Johnson Award Winner**: Nakita Burden (Identifying complex taxonomic groups of native and cultivated Rhododendrons using DNA barcoding.)
- **3rd Place Johnson Award Winner**: Jennifer Silvers (Effects of natural anti-inflammatory agents on toll-like receptor 2 expressions: Implications for Lyme neuroborreliosis response.)

**District II Outstanding BBB Advisor**: Dr. Julie Ballenger

**Alumni Accomplishments**

If you or an alum you know have attended graduate school or are working, please send us an update to:

Biology Department
Columbus State University
4225 University Ave
Columbus, GA 31907

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**Stanton Scholarship Announced**

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Stanton serves on the Board of Directors for Trees Columbus, was on the Board for the Chattahoochee Riverkeeper, and was a long-time member of the Muscogee County Board of Education. It is the culmination of years of service, hard work, experience and leadership at CSU and in the community that make George Stanton the perfect choice to honor with a new enrichment fund.

In addition to the new fund, the Biology Department has two other funds. The Flora M. Clark Fund for Improving Biology provides awards for undergraduate students interested in cellular and molecular research and also provides travel scholarships. The Van H. Grosse Fund for Bioethics was developed to support seminars in bioethics on campus.

In the fall, Biology faculty will personally call alumni to ask for donations to support scholarship funds.
The Department of Biology offers an opportunity to complete an undergraduate research experience in the B.S. degree in biology. The department has been at the forefront in a national trend to provide such experiences for undergraduate students. The purpose of this research experience is to enable students to better develop critical thinking and those intellectual and technical skills associated with planning, executing, and communicating research discoveries.

### Student Research Projects

<table>
<thead>
<tr>
<th>Student(s)</th>
<th>Advisor</th>
<th>Presented At</th>
<th>Research Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neena Alex, Eunhye Cho &amp; Keeli Johnson</td>
<td>Dr. Katey Hughes</td>
<td>CSU Tower Day</td>
<td>Bahamian bush medicine: a study based on the Andros Study Abroad Experience.</td>
</tr>
<tr>
<td>Nakita Burden</td>
<td>Dr. Kevin Burgess</td>
<td>ASB/BBB and CSU Tower Day</td>
<td>Identifying complex taxonomic groups of native and cultivated Rhododendrons using DNA barcoding.</td>
</tr>
<tr>
<td>Eunhye Cho &amp; Melora Slotnick</td>
<td>Dr. Katey Hughes</td>
<td>CSU Tower Day</td>
<td>Faces of Andros.</td>
</tr>
<tr>
<td>Christina Cox</td>
<td>Dr. Bill Birkhead</td>
<td>CSU Tower Day</td>
<td>Distribution and relative abundance of meso-predators in the Memorial Forest on the Callaway Preserve, Harris County, Georgia: A second survey.</td>
</tr>
<tr>
<td>Alex Higgins</td>
<td>Dr. Bill Birkhead</td>
<td>CSU Tower Day</td>
<td>A comparison of Caribbean fish species in oceanic blue hole and patch reef environments.</td>
</tr>
<tr>
<td>Chris Moore</td>
<td>Dr. Brian Schwartz</td>
<td>CSU Tower Day</td>
<td>The effect of distance on the frequency of cross-fertilization between C-fern gametophytes.</td>
</tr>
<tr>
<td>Meg Rynearson</td>
<td>Dr. Bill Birkhead</td>
<td>CSU Tower Day</td>
<td>Invertebrate communities in calcareous algae.</td>
</tr>
<tr>
<td>Amy Schabel</td>
<td>Dr. Julie Ballenger &amp; Dr. John Davis</td>
<td>ASB/BBB and CSU Tower Day</td>
<td>Classification of seasonal bacteria populations growing in a Sarracenia rubra pitcher.</td>
</tr>
<tr>
<td>Beverly Whitt</td>
<td>Dr. Bill Birkhead</td>
<td>CSU Tower Day</td>
<td>Effect of an artificially applied caudal spot near the anal fin of fishes as related to avoidance of predation.</td>
</tr>
</tbody>
</table>

2010 graduate Amy Schabel studied seasonal bacteria populations in a pitcher plant.

M. Alex Higgins, an Applied Computer Science major, presented his research on Caribbean fish species at CSU Tower Day in April 2010.
Student Biological Organizations

Beta Beta Beta

Beta Beta Beta (Tri Beta) is an honor and professional society for students majoring in biology and for those with interests in the natural sciences. The focus of this organization is to foster undergraduate research and it is dedicated to improving the understanding of the process of science. The CSU Department of Biology Mu Omicron chapter was founded in 1994. It is a very active and successful program on the CSU campus. The chapter has been involved in the annual “Help the Hooch” cleanup along the Chattahoochee River and the Science Olympiad Regional Tournament, and members have served as judges for the regional Science Fair for several years. In addition, the club has organized rafting and camping trips both locally and to the north Georgia Mountains.

Members have been very successful in competing for and receiving research scholarships as well as regional and national awards for their research. Many students have won research scholarships which help defray costs associated with their independent senior research projects. Seventeen students who have presented their research at regional meetings have received the Frank G. Brooks award for outstanding paper presentations and five students have won the Johnson Award for outstanding posters. In addition, three students have gone to national meetings and won awards. Three students have had their senior research published in BIOS, the BBB society journal.

The Mu Omicron Chapter has been recognized at the national level by winning the Bertholf Award. This award honors those chapters that excel in scholarship and dissemination of scientific information through presentations and publications, and in promotion of scientific research. In 2003-2004 the chapter was recognized as being in the top 10% of chapters in the nation. In 2004-2005 Mu Omicron was again recognized with a Bertholf Award of honorable mention (placing us third in the nation) and in 2006-2007 the chapter earned the highest honor with a first-place Bertholf Award.

Chapter President: Nylvia Ware
Chapter Vice President: Terry Langfitt
Advisors: Dr. Julie Ballenger, Dr. Brian Schwartz

AMSA

The American Medical Student Association (AMSA) is a national organization dedicated to representing and organizing future health professionals. The CSU chapter’s mission is to inform, support, and provide leadership development for any interested health pre-professional students at CSU, whether they’re pre-medicine, pre-pharmacy, pre-dentistry, a nursing major, or a health science major. While most members are biology majors, there are also members majoring in chemistry, psychology, and computer science.

The main mission of AMSA at CSU is to provide students with opportunities to do community service, as well as to assume leadership roles. Community activities, ranging from health screenings to fostering the city’s youth, help students prepare for a career in health professions. The club has guest speakers every month who talk about the challenges of getting into medical, dental and other professional schools, as well as discuss their current activities in their profession.

Chapter President: Roma Patel
Chapter Vice President: Neena Alex
Advisor: Dr. Jeff Zuiderveen

PVMA

The CSU Pre-Veterinary Medical Association (PVMA) was founded through the work of Contessa Bowman, a biology major who is currently in her third year at Tuskegee Vet School. The club is open to all students with an interest in veterinary medicine, regardless of major or concentration. The PVMA encourages participation in activities to strengthen the community and the individual.

The club has participated in the annual “Help the Hooch” river cleanup and the Walk for the Cure (canine version), and volunteered for local humane organizations (including helping with the relocation of Paws Columbus to their new facility), among other service commitments. Members have taken trips to area veterinary schools and conducted mock interviews for veterinary school applicants.

The club has biweekly meetings during which they have had local veterinarians, veterinary instructors from regional vet schools, and other speakers of general interest to members.

Chapter President: Samantha Tillery
Chapter Vice President: Jaime Reed
Advisor: Dr. Glenn Stokes
Since 1999 CSU’s Department of Biology has offered 23 international programs to 282 students. Andros Island in the Bahamas was the first international program established. The experience immersed students in the ecology of the Bahamas. They spent a week on the island becoming familiar with the flora and fauna of the area and then set up and conducted a variety of mini-ecology projects. Students collected data on-site, then completed their analyses and project presentations upon returning to CSU.

The department has since added similar programs in Botswana (Africa), Queensland (Australia), Ecuador, and Costa Rica. Each site was carefully selected based on safe access to a wide diversity of pristine habitats and the opportunity for students to experience customs and culture of the countries visited.

The courses explore the unique ecology, flora and fauna of each area and provide students with the hands-on experience of developing and setting up field-based research projects.

In 2004 the department’s success with international programming was recognized when it was selected as the “Best Practices in International Education: Most Internationalized Academic Unit” by the University System of Georgia Board of Regents.

In 2007 the department added the first CSU international service learning course. This course offers pre-professional health-focused majors an opportunity to serve in the health clinics on Andros Island in the Bahamas. Students study the biological basis of a specific health issue facing the Bahamian people and then discuss this issue with Andros communities and clinics. They also donate needed medical supplies to clinics.

In the past few years, biology classes have studied ecosystems in Belize, Costa Rica, Bahamas, Ecuador, Africa and Australia.

These field-oriented courses may be taken as BIOL 1225 to satisfy the lab science requirement of Area D, or as a BIOL 5535 for Area G.
Recent Graduates

B.A. in Biology:
- Mary Barrow (Pre-Medical)
- Jose Canedo
- Angela Cruz (Pre-Medical)
- Christina DiGregorio (Pre-Pharmacy)
- Alicia Garcia
- Shakema Goodman
- De’smond Henry
- Renee Ogundana (Pre-Medical)
- Ryan Richardson
- Takeema Richardson
- Tiffany Tisdale

B.A. in Biology and Secondary Ed.:
- Andrew Hartzog
- Diana Humphries
- Katherine Moultrie
- Susan Stebbins

Publications:


Presentations:

M.B. Hendricks & H. Hendricks 2010. The use of rubrics for promoting and evaluating student learning. 8th Annual Interdisciplinary Conference for Teachers of Undergraduates, Barnesville, GA.


Guest Speakers:

John Barone – Auburn University, Auburn, Alabama. Distribution & ecology of southeastern prairies.

Kevin Burgess – University of Georgia; North Georgia College and State University; Emory University. Discriminating plant species using DNA barcodes.

Julie Ballenger – Fort Hays State University, Hays, Kansas. Characterization and conservation of wetland plant communities in the Georgia fall line sand hills. A road less traveled: incorporating international field experiences into a biology curriculum.

Contracted Research:

Bill Birkhead - Survey of fishes inhabiting sandhills streams of the Ft. Benning Reservation. (Osage, Inc.)

Survey for the Bluestripe Shiner, Alligator Snapping Turtle and Barbour’s Map Turtle in the vicinity of the confluence of Upatoi Creek and the Chattahoochee River. (J. Carter & Assoc. - contract pending)

Carson Stringfellow & Bill Birkhead - Determination of the fish host for the purple bankclimber. (U.S. Fish & Wildlife Service)

Carson Stringfellow - Freshwater Mussel Workshop at the Jones Research Center. (USFWS)

Julie Ballenger - Characterization and conservation of wetland plant communities in the Georgia fall line sand hills. (The Nature Conservancy)

Grant Submissions:

M. Motley - Role of Gliotoxin in Aspergillosis. (National Institutes of Health)

B. Brosi (PI), K. Burgess (Co-PI), P. Armsworth (Co-PI), and J. Dunne (Co-PI). Functional pollination networks & the maintenance of species & genetic diversity. (National Science Foundation Collaborative Proposal)

K. Burgess (PI), J. Barone (Co-PI), S.G. Newmaster (Co-PI). Structure of pollination webs in prairie remnants: analysis with DNA barcoding. (NSF)


A. Garcia, M. Elmore, J. Ballenger and K. Burgess. Demographic and genetic consequences of small population size in Arabis georgiana (Georgia Rockcress). (USFWS - received; Georgia Native Plant Society - submitted)
The Biology Department was created in 1982. The labs were in the Tucker Building (now Tucker Hall). Faculty offices were in Tucker, Howard and Faculty Office Building.

The Biology Club was formed in 1970. Kathy Miller was the first president and George Stanton was the first faculty advisor. In 1994 the club became the Mu Omicron Chapter of Beta Beta Beta. The chapter has been recognized several times as an outstanding chapter in the region and in the nation, and for outstanding faculty advisor and chapter history.

Today, 15 faculty work with over 400+ biology majors, teaching introductory biology, providing courses for nursing students and graduate students in the environmental science program, and mentoring student research projects.

Biology students began presenting their research at regional Beta Beta Beta meetings in 1997, and since then many CSU students have won first, second or third place awards. The first regional winner went on to place 2nd at the national meeting.

Members of the 1979 National Science Foundation research team

The first BS in Biology was awarded at Columbus College 41 years ago. Nine students were awarded biology degrees that year, including Carson Stringfellow, who is now a member of the faculty.

The Biology Department continues to attract some of the strongest students on campus, with 17 biology majors being awarded the Faculty Cup since 1960.

Building upon the experiences of more than 60 students who participated in NSF-supported projects in the 1970s, undergraduate research has remained an important component of the curriculum.

Did You Know? Some facts about the department...

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