Greetings and Welcome

Aide Maria Kalis Buchanan, are two of the reasons why Biological Sciences is such a great place to work.

It was once again my great pleasure to attend the spring commencement ceremony and watch 33 graduating biology students receive their diplomas. These graduates will be going on to medical school, other graduate programs and/or entering the job market and we wish them the absolute best. On the subject of completing degree programs, this semester also included two history-making events as Allison Hilbun (supervisor Istvan Karsai) and Jennifer Price (supervisor Thomas Jones) became the first two doctoral candidates to successfully complete the program. We are very proud of both Allison and Jennifer.

As always, I would like to thank the donors who made contributions to the Department of Biological Sciences. These funds are used for student research awards and scholarships in addition to supporting such things as the Warden Herbarium, the ETSU Arboretum, and our “EagleCams.” These initiatives would simply not be possible without the generosity of the friends of the department. If you are interested in making a donation, please contact me directly at bidwell@etsu.edu.

Enjoy this edition of the newsletter and have a great summer!

Joe Bidwell
Professor and Chair of Biological Sciences

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Biomedical Communications
Student Awards and Recognitions

In April, the department held its annual Student Recognition and Awards Luncheon at the D.B. Culp Center. This was an opportunity to recognize graduate and undergraduate students for their support of the Department of Biological Sciences. On behalf of the department Dr. Bidwell expressed appreciation for the students’ capacity to balance teaching undergraduate laboratory sections, attending classes, and working with their mentors while still finding time to apply for grants and present their work.

Department of Biological Sciences Awards:

- William Harvey Fislay and Nina M. Fislay Award – Timothy N. Audum (Advisor- Dr. Dhirendra Kumar)
- Dr. Denise Pov Research Award – Melissa N. Campbell (Advisor- Dr. Joe Bidwell)
- Marco Davis Research Award – Cindy Lynn Barrett (Advisor- Dr. Frosty Levy)
- Herman O’Dell Award for Outstanding Junior – Charlotte Leonie Kaestner
- Biological Sciences Outstanding Senior Award – Katelyn A. Mathis

ETSU School of Graduate Studies and ETSU Graduate Council Research Grant Recipients:

- Dr. Bidwell, Kaitlyn Mathis and Dr. Duncan and Aubrey Sciara
- Dr. Dhirendra Kumar
- Photo: Amy Weber
- The Outstanding Thesis Award – Preethi Sathananthan

Other Awards:

- ETSU Faculty Award for Outstanding Student in Biological Sciences: Makensie Davenport
- The 2016 Harold Love Outstanding Community Involvement Award, State of Tennessee Higher Education Commission: Md Mahbubur Rahman
- American Society of Plant Biology Competitive Student Travel Award: Jedadiah Chilufya
- Graduate School Representative for the Day on the Hill Presentation: Md Mahbubur Rahman

2016 Appalachian Student Research Forum Award Winners:

Graduate, undergraduate, master candidates and doctoral candidates who presented at the 2016 Appalachian Student Research Forum

First-Place Winners: Oral Presentations

- Jedy Chilufya, ANTI-INFLAMMATORY MEDIATED GROWTH INHIBITION IN PHYSCOMITRELLA PATENS (Advisor- Dr. Aruna Kilaru)
- Aubrey Scora, CHARACTERIZATION OF ANTI-INFLAMMATORY MICROGLIA IN ANTERIOR CINGULATE CORTEX WHITE MATTER IN AUTISM SPECTRUM DISORDER (Advisor- Dr. Gregory Ordway)

First-Place Winners: Poster Presentations

- Sargam Kandiel, BIOCHEMICAL CHARACTERIZATION OF A Cp-3-O-GT MUTANT P145T AND STUDY OF THE TOXIC EFFECTS ON GGT ACTIVITY (Advisor- Dr. Cecilia McIntosh)
- Tupa Akhtrate, EFFECTS OF SEPSIS ON RENAL STRUCTURE AND SYMPATHETIC INNERVATION IN MICE (Advisor- Dr. Dan Hoover)
- Nathaniel Hancock, UNDERGRADUATE, BEHAVIORAL EFFECTS OF SUB-LETHAL CADMIUM (Cd) EXPOSURE IN THE SPIDER ANELIOMUS STUDIOBIS (Advisor- Dr. Thomas Jones)

Second-Place Winners: Poster Presentations

- Melissa Campbell, EFFECTS OF PREDEATH CUES ON METAL TOXICITY IN GAMBUSIA AFFINIS (Advisor- Dr. Joseph Bidwell)
- Alkison Hilburn, BALANCING STRATEGY WITH PAIN (Advisor- Dr. Ihsham Karasa)
- Charlotte Kaestner, THE EFFECTS OF ANTIPSYCHOTIC TREATMENT UPON NICOTINE ASSOCIATIVE REWARD IN A NEONATAL QUINPIROLE MODEL OF SCHIZOPHRENIA (Advisor- Dr. Russell Brown)

Other Award Presentations

- CITYKINES IN CACO-2 CELLS
- STUDY OF THE EFFECTS OF COMBINED STRESSORS IN AMPHIPODS (GAMMARUS MINUS) AND ISOPODS (ASELLUS INTERMEDIUS) (Advisor- Dr. Jonathan Peterson)
- ELUCIDATING THE ROLE OF N-ACYLETHANOLAMINE/ANANDAMIDE METABOLISM IN THE MOSS PHYSCOMITRELLA PATENS
- STUDY OF THE EFFECTS OF COMBINED STRESSORS IN AMPHIPODS (GAMMARUS MINUS) AND ISOPODS (ASELLUS INTERMEDIUS) (Advisor- Dr. Jonathan Peterson)

Cont. Student Awards and Recognitions:

2016 Appalachian Student Research Forum Biology Student Presenters:

IDENTIFICATION AND FUNCTIONAL ANALYSIS OF AVOCADO DGAT1 AND DGAT2 EXPRESSED IN YEAST Presented by Md Mahbubur Rahman (Advisor- Dr. Aruna Kilaru)

BIOCHEMICAL CHARACTERIZATION OF FATTY ACID AMIDE HYDROLYASE IN PHYSCOMITRELLA PATENS Presented by Swatik Swati (Advisor- Dr. Aruna Kilaru)

DECONSTRUCTING SCIENCE PRACTICE SKILLS IN THE INTRODUCTORY BIOLOGY CLASSROOM: INVESTIGATING INSTRUCTOR TEACHING STRATEGIES Presented by Soro Noroom (Advisor- Dr. Anou Naffie)

CHARACTERIZATION OF FATTY ACID AMIDE HYDROLYASES IN TOMATO Presented by Vijay Tiwari and Danek Stuffle (Advisor- Dr. Aruna Kilaru)

MODERNIZING EDUCATIONAL RESOURCES FOR AN ADVANCED ANATOMY LAB EXPERIENCE Presented by Savannah Mathis, Amber Brooks, Rob Becker (Advisor- Dr. Thomas Kassiagroth)

STRESS SIGNALING IN A RESPONSE TO DEHYDRATION (RD22) SILENCED TRANSGENIC LINE OF NICOTIANA TABACUM Presented by Mackenzie Davenport (Advisor- Dr. Dhirendra Kumar)

IMPACT OF REDUCED CALCIUM DURING DEVELOPMENT IN SNAKES Presented by Kaitlyn Mathis (Advisor- Dr. Rebecca Pyles)

CHARACTERIZATION OF A PURATIVE LIPID TRANSFER PROTEIN AND ITS ROLE IN STRESS SIGNALING IN PLANTS Presented by Aastum Timothy (Advisor- Dr. Dhirendra Kumar)

AFFECT OF THE MUTATION D344P ON THE REGIO AND OR STEREOSPECIFICITY OF Cp3-O-GT Presented by Nathan Spaulding (Advisor- Dr. Cecilia McIntosh)

PRO-INFLAMMATORY MICROGLIA PATHOLOGY IN THE ANTERIOR CINGULATE CORTEX IN ASD Presented by Emily S. Pendas, Aubrey N. Scora, Jessica D. Crawford (Advisor- Dr. Michelle J. Chandler)

IDENTIFYING THE ROLE OF TOBACCO GLICOSYLTRANSFERASE SIPA IN PLANT STRESS SIGNALING Presented by Behroz Aminpoor, Abdisalam Zedeno (Advisor- Dr. Dhirendra Kumar)

FUNCTIONAL VALIDATION OF WRINKLED ORTHOLOGS IN AVOCADO OIL BIOSYNTHESIS Presented by Sirno Bhakta (Advisor- Dr. Aruna Kilaru)

SYNERGISTIC EFFECTS OF COMBINED STRESSORS IN ARTHROPODS (GAMMARUS MINUS) AND ISOPODS (ASELLUS INTERMEDIUS) Presented by Trevor Champion (Advisor- Dr. Joseph Bidwell)

THE EFFECTS OF RESIDENT PRODUCERS IN CONNECTED HABITATS: AN AGENT-BASED MODELING APPROACH Presented by Shriya Thapa (Advisor- Dr. Ihsham Karasa)

THE COMBINED EFFECTS OF LEPTIN AND OESTRADIOL D19 IN AMELIORATING OBESITY-INDUCED INFERTILITY IN FEMALE RATS Presented by Adakade Adaeza, Effiong Chal aujourd'hui (Advisor- Dr. Jonathan Peterson)

SCAVENGING RECEPTOR EXPRESSION IS INCREASED IN SEPTIC PATIENTS Presented by Adam Batenor, Joshua Wienczakowski, Ahmad Albalbissi (Advisor- Dr. Tammy Clement)

CHARACTERIZATION OF SIR2 LIKE DEACETYLASE FOR ITS ROLE IN STRESS Presented by Bai Krishna Thakuri, Mackenzie Davenport, Md Imadul Haq (Advisor- Dr. Dhirendra Kumar)

ELUCIDATION OF THE PATHWAY BY WHICH THE MINOR PHEN ORIGINS REGULATES ALGAE EXPRESSION IN PSEUDOMonas AERUGINOsa Presented by Danielle Williams (Advisor- Dr. Christopher Pritchett)

CULTURED MILK LACTOBACILLUS RHAMNOSUS ISOLATE MODULATED THE PRODUCTION OF INFLAMMATORY CYTOKINES IN Caco-2 CELLS Presented by Beverly Nguyen (Advisor- Dr. Edward Onyango)

ELUCIDATING THE ROLE OF N-ACYLETHANOLAMINE/ANANDAMIDE METABOLISM IN THE MOSS PHYSCOMITRELLA PATENS Presented by Md Imadul Haq (Advisor- Dr. Aruna Kilaru)
The ETSU Biological Sciences EagleCam Project is off to a successful start.

Both the Bluff City and Johnson City nests contain one healthy eaglet each. These birds have had to endure freezing and high temperatures as well as strong winds in order to raise their chicks. The pair at Bluff City is in its fifth nesting season and hatched its ninth chick on March 9, 2016. The Johnson City pair is in its fourth nesting season and welcomed its seventh chick on March 20, 2016. In the weeks to come, keep an eye out for developmental milestones. The chicks will begin feeding themselves and “branching” to test their wings!

As of April 21, 2016, we have had over 720,000 views on our Johnson City nest and over 266,000 on the Bluff City nest, and they have been viewed in 165 countries! From 4/11 - 4/21 there was an increase of 91,000 views total between the two cameras. The ETSU EagleCam Project has great potential for research and conservation. Please join our ETSU EagleCam Facebook page or follow us on LiveStream.com to participate! If you wish to help support ETSU EagleCam Project in the years to come, please visit the ETSU Biological Sciences homepage and click the “Give Now” arrow.

Thank you all for your support!

Submitted by Kevin Brooks

The abstract of Allison’s dissertation: The complexity of the interface between the muscular system and the nervous system is still elusive. We investigated how the neuromuscular system functions and how it is influenced by various perturbations. Postural stability was selected as the model system, because this system provides complex output, which could indicate underlying mechanisms and feedback loops of the neuromuscular system. We hypothesized that aging, physical pain, and mental and physical perturbations affect balancing strategy, and based on these observations, we constructed a model that simulates many aspects of the neuromuscular system. Our results show that aging changes the control strategy of balancing from more chaotic to more repetitive. The chaotic elements ensure quick reactions and strong capacity to compensate for the perturbations; this deeply reactive state changes into a less reactive, slower, probably less mechanically costly balancing strategy. Mental tasks during balancing also decreased the chaotic elements in balancing strategy, especially if the subject experienced chronic pain. Additional motoric tasks, such as tying knots while balancing, were correlated with age but unaffected by chronic pain. Our model competently predicted the experimental findings, and we proceeded to use the model with an external data set from Physionet to predict the balancing strategy of Parkinson’s patients. Our neurological model, comprised of RLC circuits, provides a mechanistic explanation for the neuromuscular system adaptations.

Another successful dissertation was given by Jennifer Bryson Price, also in our Ph.D. program with the Biomedical Sciences. Her committee members are Dr. Thomas Jones (chair), Dr. Darrell Moore, Dr. David Roane, Dr. Antonio Rusinol, and Dr. Stacy Brown. The title is: Exploring the Relationship between Behaviour and Neurochemistry in the Polyphenic Spider, Anelosimus studiosus (Araneae: Theridiidae).

The abstract of Jennifer’s dissertation: The importance of social behaviour is evident in human society, but there are both costs and benefits associated with cooperation and sociality throughout the animal kingdom. At what point do the benefits outweigh the costs, and when do selective pressures favour sociality and colonisation over solitude and independence? To investigate these questions, we have focused on an unusual species of spider, Anelosimus studiosus, also known now as the northern social spider. Throughout its broad range, A. studiosus is solitary and aggressive, but recently, colonies of cooperative and social individuals have been observed at northern latitudes. This leads to two research questions: 1) what characteristics differentiate the two variants behaviourally, and, 2) how are they different physiologically? Colonies and individuals were collected from multiple populations throughout the Tennessee River watershed area and maintained in a laboratory environment for quantitative and qualitative assessment of behavioural traits as well as specific neurochemical analysis by high performance liquid chromatography with electrochemical detection. I looked at the influence of factors such as age, reproductive state, nutritional state, and time of day on behaviour and neurochemistry. I found correlations between social behaviours and serotonin, aggressive behaviours and octopamine (invertebrate counterpart of norepinephrine), and several other compounds associated with an increase in social aggression. These studies combine techniques from multiple disciplines to contribute to a greater understanding of the proximate control of social and aggressive behaviours as well as factors influencing the evolution of sociality.

The Department of Biological Sciences is proud to have Allison and Jennifer represent the first ever Ph.D. graduates from the department.
**Bidwell Lab**
Both Trevor Chapman and Melissa Campbell presented their current data at the Appalachian Student Research Forum, and their data on different aspects of this research complemented each other to give the audience a good idea of the expected outcome of each study. Trevor’s poster title was “Combustion Stoichiometry in Lepidoptera: Thermal Stress and Production”, while Melissa’s was “Effects of Pollution Clouds on Metal Toxicity in Gambusia affinis”. Melissa took second place in Natural Sciences, Group 4 for her poster presentation at the forum, a very exciting accomplishment for the lab. As they both approach their final term of graduate school, their expertise in each respective area of combined research work is proving to be very useful in helping each other finish off their data collection so that they may begin writing their theses by the end of the summer.

**Moore Lab**
Dr. Moore’s lab this semester will be studying honey bees for daily patterns of circulating neurohormones. In order to see significant changes in levels of neurohormones, the first step will be to record the baseline levels for individual honey bees. We will be using captive foragers, newly emerged honey bees, and foragers that have not foraged. All these groups will be placed on a LD 12:12 for 7 days under constant conditions. On day 7, ten bees will be sampled from each group and analyzed. On day 7, ten bees will be sampled from each group and analyzed for daily patterns of circulating neurohormones by E. Moore.

**Kumar Lab**
Dr. Dhirendra Kumar joined the Department of Biological Sciences in 2005 as a tenure-track assistant professor. Prior to coming to ETSU, Dr. Kumar worked as post-doctoral research associate at Cornell University. At ETSU, he teaches “Biochemistry of Metabolism” and “Plant Physiology” courses to both undergraduate and graduate students. Dr. Kumar was tenured and promoted to the rank of associate professor in 2011. In 2013, Dr. Kumar briefly served as the interim chair of the Department of Biological Sciences. Dr. Kumar served briefly as a member of departmental graduate committee and graduate coordinator. Dr. Kumar has served on a number of committees including Faculty Senate, College of Arts and Sciences Basile Chair Selection Committee, College of Arts and Sciences Awards Committee, Appalachian Student Research Forum, University level Academic Portfolio Review Committee and Biochemistry and Chemical Safety Committee. He was recently honored for completing 10 years of service at ETSU. In 2015, Dr. Kumar was elected as a treasurer for the “Phytochemical Society of North America” (an international scientific society) for a three-year term.

**Yampolsky Lab**
This past year has been a fun one as Dr. Yampolsky’s lab! To start off the year, our lab attended and presented at the Southeastern Population Ecology & Evolutionary Genetics Conference (SEPEEG) down in Georgia. This past semester has been mainly focused on thesis work. I was able to successfully defend my thesis this past March, while my labmate, Brett, was also able to finish his thesis as well! These past two years of working in Dr. Yampolsky’s lab has been a fantastic experience, between meeting so many great people and continuously being challenged, and one that I will always be thankful for!

**ETSU grad student wins statewide service award**
Mdk. Mahbubur Rahman came from Bangladesh in 2012 to pursue a Ph.D. in Biomedical Sciences under the mentorship of Dr. Aruna Kilaru. In addition to fulfilling his academic goals, he has also been working with ETSU’s Christian Student Organization to build a relationship between international students and local communities. He was particularly proactive in advocating for understanding, charity and friendship among people of different cultures and disciplines. Mahbub was one of five students awarded the 2016 Harold Love Outstanding Community Service Award. On April 21, 2016, Mahbub traveled to Nashville, TN, and received his award from the members of the Tennessee Higher Education Commission. See the full article here: http://etsu.edu/advisors/2016-harold-love-award/.
Makayla Payne mounts a plant specimen at the ETSU Herbarium, in her final recent collections from the Bays Mountain Park and adjacent properties at the Spring 2016 Update for information on the John C. Warden Herbarium, contact Dr. Tim Joey Shaw (UT-Chattanooga) and Ashley Morris (MTSU) will run throughville, as well as seven smaller Tennessee herbaria. This grant, led by Drs. herbaria, including the large collections of Vanderbilt University (now at the will produce digital photographs of all of the collections from Tennessee received the Marcia Davis research award for her investigation of the fungal in her field-oriented study of the rare Gray’s Lily of Roan Mountain, an Barrett, an MS student working with Dr. Levy, has used our collections and used specimens for introductory biology laboratory exercises. Cindy we provided herbarium tours to students in the Honors in Biology program, . During the past four years, work-study student Makayla Payne has mounted and accessioned many hundreds of specimens for the Herbarium. She has also been doing repairs to older specimens in our collection. This is Makayla’s final semester in her undergraduate program, and she will be starting the ETSU program in Pharmacy this fall. We appreciate her conscientious work in the Herbarium. Makayla is currently mounting student plant collections from the Appalachian Flora course, which is taught each May by Adjunct Curator James T. Donnald. Jamie’s expertise in our regional flora has been crucial to the Herbarium’s work for over two decades. We continue to mount and accession the thousands of specimens Jamie’s contributed over the years. Additionally, he selects hundreds of student collections from the Appalachian Flora course to add to our main collections. The herbarium supports both teaching and research at ETSU. This semester we provided herbarium tours to students in the Honors in Biology program, and used specimens for introductory biology laboratory exercises. Cindy Barrett, an MS student working with Dr. Levy, has used our collections in her field-oriented study of the rare Gray’s Lily of Roan Mountain, an endemic to our southern Appalachian mountains top-builds. Cindy recently received the Marcia Davis research award for her investigation of the fungal pathogen which has infected the Gray’s Lily on Roan Mountain. The ETSU Herbarium is participating in an NSF supported project which will produce digital photographs of all of the collections from Tennessee herbaria, including the large collections of Vanderbilt University (now at the Botanical Research Institute of Texas) and of University of Tennessee-Knoxville, as well as seven smaller Tennessee herbaria. This grant, led by Mrs. Joey Shaw (UT-Chattanooga) and Ashley Morris (MTSU) will run through 2017, and the imaging of ETSU’s collections is planned for summer 2017. For information on the John C. Warden Herbarium, contact Dr. Tim McDowell, at 423-398-9437 or at mcdowalt@etsu.edu. Submitted by Dr. Tim McDowell

Robert Garrett, ETSU December 2015 and now MS student reviewed his recent collections from the Bays Mountain Plateau and adjacent properties at the ETSU Herbarium. Photo: Dr. Tim McDowell.

Makayla Payne reviews a plant specimen at the ETSU Herbarium, in her final recent collections from the Bays Mountain Plateau and adjacent properties at the ETSU Herbarium. Photo: Dr. Tim McDowell.

Mackenzie Davenport is a senior biology major and an ETSU University Honors Scholar. She began working on research in biology her sophomore year with Dr. Robert Barsanti. Kaitlyn was selected for the NSF-sponsored summer research program in “Integrative Developmental Biology” here at ETSU. Her research project concerned the impact of reduced calcium during development in the corn snail (Pari- esulus gurumia). Using an experimental approach that reduced calcium available to developing embryos, Kaitlyn investigated the anatomical and developmental bases for resulting smaller size in hatchlings. Findings of her research add significantly to our understanding of the evolution of viability (live birth) in vertebrate animals. She has presented her research at the Boland Symposium (2015, 2016), and the National Collegiate Honors Conference (2015). By vote of our faculty, Kaitlyn was selected as the 2016 Outstanding Senior in the Biological Sciences. After graduating on May 7th, Kaitlyn’s next stop is Veterinary School, where we are sure that her interest in reptiles will be an asset to everyone. William Seth Ratliff graduated in De- cember 2015 as an ETSU Midway Honors Scholar. Seth conducted a field-based project on the complex pathogen-pest system in which the hemiparasitic snail Buckelew distichophyta (parasitizes hemlock and pine trees, both of which are subject to mortal from insect pests. Seth showed that Buckelew plants closest to Virginia pine trees were more likely to have the fungal pathogen, Cenococcum applanatum, a rust whose primary host is Virginia pine. Seth’s thesis has already been published in the De- cember 2015 issue of Castanea. In the fall, Seth presented the work in a poster at the National Honors meeting in Chicago in 2015.

Nathaniel Hancock graduated May 7th as an ETSU University Honors Scholar. Nathaniel got involved in research very early in his academic career. In the summers of 2013 and 2014, he had an NSF funded fellowship with the ETSU Collaborative Research on the Appalachian Road of Life (CAROL) project. He presented his research on that project at a national meeting and coauthored a publication. In the summer of 2015 Nathaniel was a National Park Intern, working on stream restoration in the Great Smoky Mountains National Park. Na- thaniel developed his own Honors Thesis project entitled “Behavioral Effects of Sub-lethal Cadmium (Cd) Exposure in the Speckled Anole (Aneides sphenops).” His work was recognized as a runner-up at the 2015, and winner of the 2016 Appalachian Student Research Forum held at ETSU every spring. Throughout his undergraduate career, Nathaniel has been involved in conservation-related stu- dents organizations. After graduating from ETSU on May 7th, Nathaniel is going on to do graduate work in the conservation biology of fish at the University of Georgia’s Warnell School of Forestry and Natural Resources.
Department News:

1. Dr. Cecilia McIntosh was an invited seminar speaker by the University of Nevada-Las Vegas School of Life Sciences on March 18, 2016. The seminar was entitled "Structure and Function of Flavonoid Glucosyltransferases: Using a Specific Grapefruit Enzyme as a Model." She was hosted by Dr. Christy Strong, an ETSU M.S. Biology alumna.

2. Congratulations to Amy Weber, Scientific Laboratory Coordinator, Department of Biological Sciences for winning April’s Employee Recognition Program sponsored by Human Resources. Dr. Baboolal and the department supported the nomination in recognition of Amy’s tireless work ethic and dedication to the department.

3. Dr. Cerrone Foster participated in Alpha Sigma Iota’s Save A Rock Food Raizer. Dr. Foster raised the most food of all the faculty participating. For their fundraising efforts, Dr. Foster and ETSU President Dr. Noland each received a pie in the face from a lucky student. All proceeds benefited Bucky’s Food Raiser, and some unused equipment to Science Hill High School in Johnson City, Tennessee.

4. Dr. Anna Hiatt was the College of Arts and Sciences award committee’s selection to receive the ETSU’s New Faculty Award. This was quite an accomplishment for someone in her second year teaching.

5. After purchasing new equipment, ETSU Biological Sciences donated the replaced and some unused equipment to Science Hill High School in Johnson City, Tennessee. The Biology teacher at Science Hill, Thomas Bier, sent a note of gratitude stating, “Thank you, again, for the abundant supply of equipment. The science teachers have enhanced my science career. This work and will undoubtedly continue to liven up the scientific classroom. That enable dynamic exchange of ideas have exactly that. Beyond the workbench, and outside has created a foundation for someone in her second year teaching. My time as a graduate student at ETSU..." (https://www.etsu.edu/biology/news/stories/2016/06/29)

6. Dr. Kilaru and five of her graduate students from the Department of Biological Sciences attended the 2016 annual meeting of the Southern Section of the American Society of Plant Biologists, held recently at Denton, TX. While Dr. Kilaru moderated one of the sessions at the three-day meeting, her students Mahbubur Rahman (Ph.D.), Vijay Tiwari (MS) and Ismad Ali (MS) gave oral presentations and Shima Bhatai (MS) and Imaduddin Haq (Ph.D.) participate in poster presentations. The Department of Biological Sciences and Biomedical Sciences, Office of Equity and Diversity, the Graduate and Professional Student Association and National Science Foundation Grant to Kilaru provided travel funds.

Biology Department Welcomes New Postdoctoral Researcher

Dr. Suhas Shinde is a native of India, received his B.Sc. in Botany and Applied Biotechnology from the University of Pune, and M.Sc. Botany from the University of Pune, in India, and Ph.D. in Biological and Environmental Science from the University College, Dublin, Ireland. For doctoral work, under the mentorship of Dr. Carl Nag, Suhas investigated the response mechanisms of an extant moss, Physcomitrella patens, to atmospheric conditions simulating the Triassic-Jurassic Boundary climate and elevated CO2 levels. This research revealed global transcriptional changes in moss that can mount a robust signaling to elicit reprogramming of stress tolerance to cope with catastrophic environmental conditions. He worked as a postdoctoral researcher with Dr. Paul Verslues’ lab at Academia Sinica’s Institute of Plant and Microbial Biology, Taipei, Taiwan. Dr. Suhas Shinde now brings his expertise to work on anandamide-mediated stress signaling in mosses, an NSF-IOS-funded project in Dr. Aruna Kilaru’s lab. His wife Rupali and 19-month-old son, Kshitij, are currently in India and expected to join him shortly.

Submitted by Dr. Aruna Kilaru. (Full article online)

We cannot do this alone.

It is because of the support of individuals like you that enables our department to provide research, field work and preserve our enriched learning environment.

Yes, I would like to donate to ETSU Department of Biological Sciences...

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Graduate Research Awards: □ Dr. Denise I. Pax Endowment □ Maria Dowis Biological Sciences Research Award

Undergraduate Scholarship/Research Award: □ Barclay Module Undergraduate Research Fellowship Endowment □ Dr. Herman Odell Scholarship Endowment

ETSU Arboretum: □ ETSU Arboretum Endowment

Program-Level Funds: □ Biological Sciences □ Gray’s Lily Research Fund

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