

Student Presentation Awards at the 121st Meeting of the Tennessee Academy of Science

Oral Presentations

Botany

First Place—*Emily Blyveis** and *Joey Shaw*. Vascular flora and phytogeographical analysis of the Tennessee River gorge, Marion and Hamilton counties, Tennessee. *The University of Tennessee at Chattanooga, Chattanooga, Tennessee*.

(*SY, APN*), and *Le Bonheur Children's Hospital, Memphis, Tennessee (DCS)*.

Second Place—*Reem Sidani**, *Marina Salama**, and *Beth Conway*. Endothelin Converting Enzyme-1 expression is up-regulated in invasive human breast cancer. *Lipscomb University, Nashville, Tennessee*.

Cell and Molecular Biology

First Place—*Robert S. Parker, II**, *Cody Richardson*, *Rachel Haag*, *Siddharth N. Desai*, *Jessica Hines-Beard*, and *Tonia S. Rex*. Therapeutic intraocular erythropoietin gene therapy in a mouse model of retinal degeneration. *Christian Brothers University, Memphis, Tennessee, and The University of Tennessee Health Science Center, Memphis, Tennessee*.

Mathematics and Computer Science

First Place—*Stephanie J. Jessie*. Analyzing mathematical beliefs using geometric pictures. *Austin Peay State University, Clarksville, Tennessee*.

Second Place—*Lisa Elliott**, *Tia Guarino**, *Stephanie Jessie**, and *James Winegar**. Mathematical model of a prosthetic hand from the manufacturing point of view. *Austin Peay State University, Clarksville, Tennessee*.

Second Place—*Ben Hannah**, *David Bourgeois*, and *Beth Conway*. Prostate specific membrane antigen generates laminin peptides downstream of matrix metalloproteinases that activate *in vivo* angiogenesis. *Lipscomb University, Nashville, Tennessee*.

Third Place—*Mason T. Yost*. Computational analysis of the bugey neutino oscillation experiment. *Austin Peay State University, Clarksville, Tennessee*.

Engineering and Engineering Technology

First Place—*Nicholas Luna*. Assessing software and protocol vulnerabilities in routers for secure cloud computing. *Tennessee State University, Nashville, Tennessee*.

Microbiology

First Place—*Kathryn White**, *Elisa Lund*, and *Chad Brooks*. Characterization of a *Borrelia burgdorferi* virulence determinant in dogs; a prime vaccine candidate. *Austin Peay State University, Clarksville, Tennessee*.

Health and Medical Sciences

First Place—*Joseph W. Fong**, *Sunitha Yarlappa*, *Dennis C. Stokes*, and *Anjaparavanda P. Naren*. Clinical and molecular characterization of CFTR mutants $\Delta F508$ and R347P. *Christian Brothers University, Memphis, Tennessee (JWF)*, *The University of Tennessee Health Science Center, Memphis, Tennessee*

Physics and Astronomy

First Place—*Eugenie de Silva** and *Eugene de Silva*. An analysis of the physics principles behind breaking tiles. *Harvard University, Cambridge, Massachusetts, and Walters State Community College, Morristown, Tennessee*.

Zoology

First Place—*J. Patrick W. Cussac*. Maternal transfer of methylmercury chloride in *Nerodia*

* Denotes student award winner.

sipedon. Middle Tennessee State University, Murfreesboro, Tennessee.

Second Place—*Lauren A. Madeira*. An assessment of biodiversity measurements of small mammals in western Tennessee. *The University of Memphis, Memphis, Tennessee*.

Third Place—*Christine F. Peterson*. Avian community response to timber harvest adjacent to riparian zones at Catoosa WMA. *Tennessee Technological University, Cookeville, Tennessee*.

Poster Presentations

Botany

First Place—*Kelly Casarez* and Darlene Panvini*. Effects of allelopathic intraspecific competition on growth of privet, *Ligustrum sinense*. *Belmont University, Nashville, Tennessee*.

Cell and Molecular Biology

First Place (tie)—*Monique Parrish* and Robert Grammer*. Spectrophotometric determination of respiration rates in *C. elegans*. *Belmont University, Nashville, Tennessee*.

First Place (tie)—*Ann Hanna* and Jon H. Lowrance*. Exon expression of brain-derived neurotrophic factor in cancer cell lines, HB-8501 and PC-3. *Lipscomb University, Nashville, Tennessee*.

Third Place—*Ashley Newsome*, Lori L. McGrew, Jennifer T. Thomas, and Rachel Rigsby*. Does oregano have a synergistic effect with tetracycline in the treatment of *Salmonella typhimurium*-infected *Danio rerio*? *Belmont University, Nashville, Tennessee*.

Chemistry

First Place—*Daniel H. Gouger*. Synthesis of cyclopropyl peptidomimetics as potential BACE and HCV NS3-4a protease inhibitors. *Middle Tennessee State University, Murfreesboro, Tennessee*.

Second Place—*David G. Antonelli*. Synthesis of labeled mevalonolactone. *Middle Tennessee State University, Murfreesboro, Tennessee*.

Third Place—*Rachael S. Hall*. Synthesis and application of boron-containing pyrrole species. *Middle Tennessee State University, Murfreesboro, Tennessee*.

Health and Medical Sciences

First Place—*Marina Salama*, Reem Sidani, and Beth Conway*. Nepriylisin negatively regulates human breast cancer cell invasion. *Lipscomb University, Nashville, Tennessee*.

Microbiology

First Place—*Richard Johansen* and Sergei A. Markov*. Oil production from CO₂ by microalgae in a photobioreactor using light as energy source. *Austin Peay State University, Clarksville, Tennessee*.

Second Place—*Tiffany Cathey*. Characterization of a novel *Clostridium* species isolated from the cloaca of the yellow-bellied sapsucker. *The University of Tennessee at Martin, Martin, Tennessee*.

Third Place—*Krystle Irizarry*, Marina Zaky, Jessica Matheson and Chad Brooks*. Evaluation of a magnetic-oligo bead capture system to enhance PCR detection of *Borrelia burgdorferi* DNA. *Austin Peay State University, Clarksville, Tennessee*.

Physics and Astronomy

First Place—*Arjun Tan, Brittany Bazzle*, and Mostafa Dokhanian*. The jerk vector in motion of charged particle under electric and magnetic fields. *Alabama A&M University, Normal, Alabama*.

Second Place—*Arjun Tan, Roderick Gray*, and Mostafa Dokhanian*. Cluster analyses of planets and satellites. *Alabama A&M University, Normal, Alabama*.

Science and Math Teaching

First Place—*Alison N. Carey*, Christina Nicholas, Mary B. Farone, Kim C. Sadler, and Anthony L. Farone*. Teaching scientific research through cedar glade ecology in the NSF GK-12 program. *Middle Tennessee*

State University, Murfreesboro, Tennessee, and Siegel High School, Murfreesboro, Tennessee.

Zoology

First Place—*Casey Carpenter*. Phylogeography of short-tailed shrews (genus *Blarina*) of southeast Tennessee. *The University of Tennessee at Chattanooga, Chattanooga, Tennessee.*

Second Place—*Jordan Murray*. Effects of riparian tree canopy on water quality and the occurrence of waterpennies (beetle larvae) in the Little Harpeth River. *Belmont University, Nashville, Tennessee.*

Third Place—*Taylor Ricks*. Nest site characteristics of Great Blue Herons and Great Egrets in three rookeries at Reelfoot Lake, Tennessee. *University of Tennessee at Martin, Martin, Tennessee.*

Honorable Mention (tie)—*Tristan Daniel*. Treating *Danio rerio* with the neurotoxin 6-OHDA to study movement deficits. *Belmont University, Nashville, Tennessee.*

Honorable Mention (tie)—*Will J. Evans*. Distribution and abundance of *Opiothrix suensonii* on sponge vs. non-sponge reef surface area at Whale Shoals Patch Reef in Belize. *St. Andrews Sewanee School, Sewanee, Tennessee.*