**2019 RVGS Project Forum Category Awards**

**ANIMAL SCIENCES A**

**Third Place**

**AS-A 2** The Effect of Microplastic on the Vitality of Hypsibius dujardin

Ethan Johnson, William Fleming High School

London Paige, William Fleming High School

**Third Place**

**AS-A 8** The Effect of Panax quinquefolius on the Heart Rate of Daphnia magna

Lillian Dorathy, Patrick Henry High School

Declan Morrill, Patrick Henry High School

**Second Place**

**AS-A 9** Genetic Characterization of CASK mutant mice

Erin Wienke, William Byrd High School

**First Place**

**AS-A 5** The Effect of Hemp Extract on Seizures in Drosophila

Hannah Largen, Franklin County High School

**ANIMAL SCIENCES B**

**Third Place**

**AS-B 3** Investigating the Function of the Y41D4B.26 Gene in C. elegans using RNAi

Brady Holbrook, Franklin County High School

**Third Place**

**AS-B 6** The Effect of Neurotoxins on Varying Web Strucures of Orb Weavers

Jacob McCall, Franklin County High School

Nellie Philpott, Franklin County High School

**Second Place**

**AS-B 10** The Effect of Vaping on the Development of C. elegans

Alysia Sanchez-Huerta, Lord Botetourt High School

**First Place**

**AS-B 8** The Effect of Calcium as an Inhibitor of Lead using Danio rerio

Martha (Mattie Rose) Keely, Lord Botetourt High School

**ANIMAL SCIENCES C**

**Third Place**

**AS-C 8** The Decomposition of Polystrene by Tenebrio molitor versus Galleria mellonella

Lillian Holt, Patrick Henry High School

Jennie Pham, William Fleming High School

**Second Place**

**AS-C 6** Potential Consequences of Household Herbicide Use on Aquatic Life

Abigail Tershak, Patrick Henry High School

**Second Place**

**AS-C 7** The Effect of Paullinia cupanan on the Heart Rate of Daphnia magna

Dhruvi Patel, Glenvar High School

Ethan Su, Hidden Valley High School

**First Place**

**AS-C 2** Novel mouse ESC line reveals an early contribution of pericytes during vasculogenesis

Abigail (Abbey) Ingram, William Byrd High School

**BEHAVIORAL, BIOMEDICAL, AND HEALTH SCIENCES A**

**Third Place**

**BH-A 3** The Effect of Virginia Grown Hemp Hurds on the Growth of E. coli k-12

Ann Foust Bailey, Patrick Henry High School

Abigail Hunter, Patrick Henry High School

**Third Place**

**BH-A 7** The Synergistic Effect of Cinnamon Oil and Ampicillin on the Growth of E.coli

Ruby Isbell, Patrick Henry High School

Sarah Grace Stanley, Patrick Henry High School

**Second Place**

**BH-A 1** The Effect of Garlic Temperature on the Growth of E. coli k-12

Liam Heaslip, Franklin County High School

Eliza Quesenberry, Franklin County High School

**Second Place**

**BH-A 2** The Effect of aCT-1 on Collagen Alignment in Scar Tissue

Haley McAden, Patrick Henry High School

**First Place**

**BH-A 4** Identification of Novel Diagnostic and Prognostic Biomarker Panels for Cancer Through Big Data Analysis

Kevin Sheng, Cave Spring High School

**BEHAVIORAL, BIOMEDICAL, AND HEALTH SCIENCES B**

**Third Place**

**BH-B 1** The Effect of Medical Grade Apis mellifera Venom on the Growth of E. coli

Grace Kahoun, Patrick Henry High School

Emma Thielecke, Patrick Henry High School

**Second Place**

**BH-B 3** The Effect of Vaccinium oxycoccus Delivery Methods on the Growth of E. coli

Alicia Carvalho, Cave Spring High School

Liala Sofi, Hidden Valley High School

**Second Place**

**BH-B 5** The Effect of Traumatic Brain Injury on Inhibitory and Excitatory Neurons as Revealed by Immunohistochemistry

Maya Reddy, Salem High School

**First Place**

**BH-B 7** Goal-oriented Episodic Future Thinking and Delay Discounting in an Obese Population

Elysia Lin, Franklin County High School

Madison Stein, Franklin County High School

**CELLULAR AND MOLECULAR BIOLOGY**

**Third Place**

**CM 2** Adenoviral Subversion of Intercellular Junctions

David Whitacre, Hidden Valley High School

**Second Place**

**CM 4** Utilizing CRISPR/Cas9 to Investigate Connexin43 during Hypoxic Stress

Lauren Frampton, Cave Spring High School

**First Place**

**CM 6** The role of QSOX1 in the formation and development of skeletal muscles and synapses

Shayom Debopadhaya, Salem High School

**First Place**

**CM 7** Resveratrol Mediated Epstein-Barr Virus Lytic Induction: A novel therapeutic approach for EBV-positive lymphomas

Logan Dunkenberger, Glenvar High School

**CHEMISTRY AND ENERGY**

**Third Place**

**CE 7** The Feasibility of Transforming Various Types of Biomass into Biofuel

Collin Rice, Patrick Henry High School

**Second Place**

**CE 5** The Investigation of Lead Corrosion Using Atomic Force Microscopy

Uyen Tran, William Fleming High School

**First Place**

**CE 1** Effectiveness of Magnetite Complexed Nanomaterials in Removing Heavy Metals from Water

Allison Henion, Cave Spring High School

**First Place**

**CE 2** The Removal of Azo Dyes Using Chitosan-Based Materials

Carly Smith, Franklin County High School

**EARTH AND ENVIRONMENTAL SCIENCES**

**Third Place**

**ES 4** Biodiversity Survey of Lick Run Upstream and Downstream of Washington Park

Chloe Johnson-Hodges, Patrick Henry High School

Elisabeth Taylor, Patrick Henry High School

**Second Place**

**ES 2** Characterization of Soil Bacterial Isolates and their Metabolism of Mineral Oil

Murphy Johnson, Patrick Henry High School

Richard (Jack) Shepherd, Patrick Henry High School

**Second Place**

**ES 6** The Impact of Aluminum and Silver Nanoparticles on Plants and Daphnia

Kunika Tiwari, Patrick Henry High School

**First Place**

**ES 3** A Colorimetric intI1 Gene Gold Nanosensor for Monitoring Environmental Wastewater Pollution

Adithya (Adi) Iyer, William Byrd High School

**First Place**

**ES 8** Evaluating the Impact of Coal Ash Pollution though a C. elegans Developmental Model

Mary Grace Giles, Patrick Henry High School

**ENGINEERING MECHANICS A**

**Third Place**

**EM-A 7** The Robotic Sharpener

Amelia Kitt, Patrick Henry High School

Siddhartha (Sid) Lamichhane, Patrick Henry High School

**Third Place**

**EM-A 8** RD-SP: The Smart Bot

Reece Derrick, Northside High School

Venkata (Sujith) Panchumarthy, Cave Spring High School

**Second Place**

**EM-A 9** Turning the Page of the Future

Delaney Smith, Patrick Henry High School

Anna West, Patrick Henry High School

**First Place**

**EM-A 4** Rubik's Cube Robot

David (Luke) Arner, Hidden Valley High School

Grady Brydges, Cave Spring High School

**ENGINEERING MECHANICS B**

**Third Place**

**EM-B 8** The Marker Master

Nelson Laine, Franklin County High School

Bailey McNeil, Franklin County High School

**Third Place**

**EM-B 10** The Hotdog Handler

Benjamin Anderson, Patrick Henry High School

Stephen (Frank) Andes, Patrick Henry High School

**Second Place**

**EM-B 6** Glass Half Poured Out

Katherine (Rosie) Giles, Patrick Henry High School

Rachel Roberts, Patrick Henry High School

**First Place**

**EM-B 1** Navigational Aid for the Blind Utilizing LIDAR Technology

Luke Gardner, Patrick Henry High School

Luke Suess, Patrick Henry High School

**First Place**

**EM-B 7** iRuff: A Wireless Dog Leash

Charles Murphy, Patrick Henry High School

**ENGINEERING MECHANICS C**

**Third Place**

**EM-C 2** Chassis Construction

Charles Wallace, Salem High School

**Second Place**

**EM-C 8** Arduino Powered Robotic Hand

Jennifer Fike, Franklin County High School

David (Wes) Givens, Staunton River High School

**First Place**

**EM-C 4** AUV (Automated Underwater Vehicle) to Assist with Pipeline Spills

Rafid Mirza, Glenvar High School

**First Place**

**EM-C 6** Broussais Bot

Carson Pugh, Salem High School

**ENVIRONMENTAL ENGINEERING**

**Third Place**

**EE 4** Water Filtration Using Carbon Nanomaterials and Pharaoh's Snakes

Ryan Smith, Patrick Henry High School

Shelby Stanley, Patrick Henry High School

**Second Place**

**EE 5** The Ability of Activated Carbon, Biochar, Spirulina Powder, Chlorella, and Diatomaceous Earth to Remove Lead from Polluted Water in a Cost Effective Manner

Luke Wallace, Lord Botetourt High School

**First Place**

**EE 1** The Efficacy of Cocos nucifera Coir and Polar Fleece Fibers on the Removal of Oil from Water

Megan McGinnis, Patrick Henry High School

Sarah Riddle, Patrick Henry High School

**First Place**

**EE 7** Titanium Dioxide as a Photocatalyst to Remove Water Pollutants

Giselle Pfaeffle, Patrick Henry High School

**MATERIALS SCIENCE**

**Third Place**

**MS 5** Using an Alginate Based Bioink to 3D Print Bone Structures

Christopher (Kenyon) John, Jr., Patrick Henry High School

Justin Kreft, Patrick Henry High School

**Third Place**

**MS 7** The Effect of Different Types of Bioplastics on Their Properties

Chase Sweeney, Patrick Henry High School

**Second Place**

**MS 8** Development of a Skin Substitute Using Collagen, Gelatin, and Sodium Alginate

Crawford Higgins, Patrick Henry High School

Louisa Prillaman, Patrick Henry High School

**First Place**

**MS 6** The Effect of Nanomaterial Addition on the Physical Properties of Kudzu Bioplastic

Ryan Rigatti, Lord Botetourt High School

**MICROBIOLOGY A**

**Third Place**

**MI-A 4** The Effect of Melaleuca alternifolia on the Growth of Serratia marcescens

Sara Drewry, Patrick Henry High School

Natalie Saville, William Fleming High School

**Second Place**

**MI-A 3** Results of Co-Culture Competition Assays Among Three Common Gut Bacteria

Ashlyn Boothe, Patrick Henry High School

**First Place**

**MI-A 1** The Effect of S. epidermidis on the Growth of C. acnes

Chloe Newbill, Franklin County High School

Claire Nichols, Hidden Valley High School

**MICROBIOLOGY B**

**Third Place**

**MI-B 4** A Comparison of Eucalyptus globulus Oil on Staphylococcus epidermidis and Escherichia coli Growth

Madison Brown, Franklin County High School

Cynthia Lin, Franklin County High School

**Second Place**

**MI-B 6** The Effect of Preservatives on L. acidophilus

Meitra Kazemi, Hidden Valley High School

**First Place**

**MI-B 2** The Effect of Turmeric in Preventing Damage to E. coli from Ultraviolet Irradiation

Coleman Blanton, Hidden Valley High School

**First Place**

**MI-B 8** Evaluation of Potential Limitations of Biofuel Production Using Recombinant Eschericia coli

Lilian Jones, Patrick Henry High School

**PLANT SCIENCES A**

**Third Place**

**PS-A 5** The Allelopathic Effect of Juglone on the Germination of P. vulgaris

Andres Hernandez, Lord Botetourt High School

James Voight, James River High School

**Third Place**

**PS-A 6** The Effect of Martian Soil on the Growth of Spinacia oleracea

Lynn Park, Lord Botetourt High School

Camly Tran, Northside High School

**Second Place**

**PS-A 2** The Effect of Manganese, Magnesium, and Zinc on the CO2 Absorption of Mung Beans

Tracy (Harrison) Callis, Patrick Henry High School

**First Place**

**PS-A 4** The Effect of a Cold Shock on the Defense Response in Arabidopsis

Maya Ingram, Patrick Henry High School

**First Place**

**PS-A 8** The Allelopathic Effect of C. verum on the Germination of P. oleracea

Ryan Mollin, Franklin County High School

**PLANT SCIENCES B**

**Third Place**

**PS-B 3** The Effect of Martian Regolith on the Growth of Five Different Plant Species

Isaac Fix, William Byrd High School

**Second Place**

**PS-B 2** The Allelopathic Effect of C. morifolium Organs on the Germination of L. perenne

Clara Higgins, Patrick Henry High School

Fiona Murphy, Patrick Henry High School

**First Place**

**PS-B 7** Phytoremediation of Silver Nanoparticles by Mungbeans and Radishes

Hannah Mollin, Franklin County High School

**PLANT SCIENCES C**

**Third Place**

**PS-C 5** The Allelopathic Effect of R. officinalis on the Germination of D. sanguinalis

Spencer Kearns, Staunton River High School

Abby Wyatt, Staunton River High School

**Third Place**

**PS-C 7** The Effect of Acid Rain on the Growth of Raphanus sativus and Spinacia oleracea Crops

Kierstyn Stanley, Lord Botetourt High School

**Second Place**

**PS-C 1** The Allelopathic Effect of P. montana Organs on the Germination of L. esculentum

Merryn Isbell, Patrick Henry High School

Lillian (Libby) Jamison, Patrick Henry High School

**First Place**

**PS-C 3** The Allelopathic Effect of M. officinalis Organs on the Germination of D. sanguinalis

Caroline Grant, Hidden Valley High School

Margaret (Maggie) Laflam, Hidden Valley High School

**SYSTEMS SOFTWARE A**

**Third Place**

**SS-A 1** A Program to Aid in the Assessment of Water Quality

Shannon Filer, James River High School

Leah Germain, Lord Botetourt High School

**Second Place**

**SS-A 4** Examining the Effectiveness of Convolutional Neural Networks for Determining Visual Fixation using fMRI

Harrison Huang, Hidden Valley High School

Erik Scarlatescu, Hidden Valley High School

**First Place**

**SS-A 3** Arduino-Powered Macro Keyboard

James Whiting, William Fleming High School

**First Place**

**SS-A 6** Interactive Storyteller to Improve Student Engagement and Performance

Emily (Reid) Tenzer, Patrick Henry High School

**SYSTEMS SOFTWARE B**

**Third Place**

**SS-B 5** Utilizing User Interface and Web Scrapping to Predict Weather Forecasts and Grocery Totals

Anthony LaConte, Patrick Henry High School

Michaela Robertson, Patrick Henry High School

Luke Waldenstrom, Patrick Henry High School

**Second Place**

**SS-B 2** Structural Analysis of Tumor Suppressor Proteins Using Cryo-EM

William (Billy) Luqiu, Cave Spring High School

**First Place**

**SS-B 4** Pill Bottle Holder for Dementia Patients

Jackson Moyer, Hidden Valley High School

**First Place**

**SS-B 6** Introduction of Machine Learning for Generating Maximum Efficiency in Traffic Stop Simulations

Michael Lin, Hidden Valley High School