



# Roanoke Valley Governor's School for Science and Technology

## Project Forum 2021 Awards

## Animal Sciences A Special Awards



### Excellent Verbal Presentation:

AS-A 4 The Effect of *Symphytum officinale* on the Regeneration Rate  
of *Dugesia tigrina*

Arthur Downs, Patrick Henry High School

# Animal Sciences A Place Awards



## 3<sup>rd</sup> Place:

AS-A 5 The Effect of *Catharanthus roseus* on the Regeneration Rate of *Dugesia tigrina*  
Seth Huard, Lord Botetourt High School  
Keaton Lucas, Lord Botetourt High School

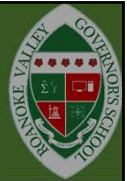
## 2<sup>nd</sup> Place:

AS-A 1 The Effect of *Holothuroidea* on the Regeneration Rate of *Dugesia tigrina*  
Thomas (Trey) Joyce, III, Salem High School  
Barbara (Ayla) Lampros, Salem High School

## 1<sup>st</sup> Place:

AS-A 6 Using the Embryonic *Danio rerio* Stress Response System to Investigate the Toxicity of Metal Oxide Nanoparticles  
Uyen Tran, William Fleming High School

# Animal Sciences B Special Awards



## Most Creative Concept:

AS-B 3 The Effect of Propylene Glycol and Nicotine on the Behavior of *Drosophila melanogaster* and their Offspring  
Ann Foust Bailey, Patrick Henry High School  
Lillian Dorathy, Patrick Henry High School  
Fiona Murphy, Patrick Henry High School

## Animal Sciences B Place Awards



### 3<sup>rd</sup> Place:

AS-B 1 The Effect of Aloe vera on the Regeneration Rate of *Dugesia tigrina*  
Evelyn Anderson, Cave Spring High School  
Kiersten Lauer, Northside High School

### 2<sup>nd</sup> Place:

AS-B 5 The Effect of Propolis on the Regeneration Rate of *Dugesia tigrina*  
Courtney Monard, Hidden Valley High School  
Griffin Yakob, William Byrd High School

### 1<sup>st</sup> Place:

AS-B 7 Investigation of Bioprinted Hydrogels for Purification of *Danio rerio* Habitats During Embryonic Development  
Alicia Carvalho, Cave Spring High School  
Liala Sofi, Hidden Valley High School

## Biomedical and Health Sciences Special Awards



### Outstanding Experimental Design:

BH 2 The Effect of Gold Nanoparticles on Cell Proliferation and Collagen Production in Neonatal Human Dermal Fibroblasts  
Margaret Laflam, Hidden Valley High School  
Natalie Saville, William Fleming High School  
Michelle Zheng, Cave Spring High School

### Most Promising for Changing Current Practice:

BH 3 A Review of the Sensitivity and Specificity of Lung Ultrasound Compared with Chest X-Rays in Diagnosing Pneumonia  
Meitra Kazemi, Hidden Valley High School

### Most Promising Future Study:

BH 7 Assessing the Efficacy of Current Vaccines Against Emerging SARS-Cov-2 Variants  
Abhinav (Abhi) Karri, Hidden Valley High School

# Biomedical and Health Sciences Place Awards



## 3<sup>rd</sup> Place (tie):

BH 4 Comparing the Change in Genetic Composition of the HA Protein of Influenza A Subtypes Over Time

Taylor Dawson, William Byrd High School  
Owen McKenna, Patrick Henry High School

BH 6 Application of Raman Spectroscopy Biomarkers to Rametrix

Lacey Ngo, William Fleming High School

## 2<sup>nd</sup> Place (tie):

BH 5 An Investigation of the Accumulation of Mutations in the COVID19 Genome

Tracy (Harrison) Callis, Patrick Henry High School  
Elizabeth Fedor, William Byrd High School

BH 1 Comparing the Efficacy of Different Face Masks Using T4 Bacteriophage Droplets

Alexandra (Lexie) Rhodes, Hidden Valley High School  
Camly Tran, Northside High School

# Biomedical and Health Sciences Place Awards (continued)



## 1<sup>st</sup> Place (tie):

BH 2 The Effect of Gold Nanoparticles on Cell Proliferation and Collagen Production in Neonatal Human Dermal Fibroblasts

Margaret Laflam, Hidden Valley High School  
Natalie Saville, William Fleming High School  
Michelle Zheng, Cave Spring High School

BH 3 A Review of the Sensitivity and Specificity of Lung Ultrasound Compared with Chest X-Rays in Diagnosing Pneumonia

Meitra Kazemi, Hidden Valley High School

BH 7 Assessing the Efficacy of Current Vaccines Against Emerging SARS-Cov-2 Variants

Abhinav (Abhi) Karri, Hidden Valley High School

# Cellular and Molecular Biology Special Awards



## **Perseverance:**

CM 3 The Effect of Varying Structured Environments on the Regenerative Properties of Liver Cells

Katherine (Rosie) Giles, Patrick Henry High School

Allyson Hoosier, Patrick Henry High School

Julie Vong, Patrick Henry High School

## **Perseverance:**

CM 6 The Effect of Nanoparticles on Cell Division

Alex Porras, Patrick Henry High School

Rachel Roberts, Patrick Henry High School

Delaney Smith, Patrick Henry High School

# Cellular and Molecular Biology Place Awards



## **3<sup>rd</sup> Place:**

CM 4 Using CRISPR-Cas9 to Edit Human Breast Cancer Fibroblasts in Cell Culture

Madison Brown, Franklin County High School

Dhruvi Patel, Glenvar High School

## **2<sup>nd</sup> Place (tie):**

CM 2 Viral Hijacking of Intercellular Junctions Facilitates Spread

David Whitacre, Hidden Valley High School

CM 5 The Effect of Kaempferol and Myricetin on Breast Cancer Cell Proliferation and the Expression of the Bcl-2 Gene

Lynn Park, Lord Botetourt High School

Annelise Wolfe, Lord Botetourt High School

## **1<sup>st</sup> Place:**

CM 1 Analyzing the Cell Viability and Cell Signaling Activity of an Alginate-based Synthetic Extra-Cellular Matrix Scaffold

Catherine Chen, Cave Spring High School

Caroline Grant, Hidden Valley High School

Vineel Kavuru, Hidden Valley High School

# Computational Biology Special Awards



## Enthusiasm:

CB 3 An Examination of Sickle Cell using Differential Gene Expression Analysis

Simran Gill, Salem High School

Jamesa (Mecayla) Gray, Franklin County High School

## Project Concept:

CB 4 Bioinformatics Study of Arrhythmia to Explore Potential Treatment Options

Hassan Al-Qattan, Patrick Henry High School

# Computational Biology Place Awards



## 3<sup>rd</sup> Place:

CB 5 The Effect of Air Quality on the Risk of Pancreatic Cancer

Sarah Hall, William Fleming High School

Ethan Johnson, William Fleming High School

## 2<sup>nd</sup> Place:

CB 7 The Genetic Correlation Between Multiple Sclerosis and Various Autoimmune and Neurodegenerative Diseases

Ella Bryant, Northside High School

Holly Hinchy, Cave Spring High School

## 1<sup>st</sup> Place:

CB 2 Investigating Alternatives to Conventional Chronic Kidney Disease Treatment Through Analysis of Differential Gene Expression

London Paige, William Fleming High School

# Earth and Environmental Sciences Place Awards



## 3<sup>rd</sup> Place:

ES 1 Assessing the Presence of Microplastics and Nanoplastics in Local Freshwater

Leah Germain, Lord Botetourt High School

Walker Wright, Cave Spring High School

## 2<sup>nd</sup> Place:

ES 2 Analysis of Microbial Diversity in PCB-Contaminated Soils

Eleanor Little, Patrick Henry High School

## 1<sup>st</sup> Place (tie):

ES 5 Assessment of Glyphosate in Blue Ridge Honey

Shannon Filer, James River High School

ES 6 Use of Titanium Dioxide Nanoparticle Enhanced Paint to Reduce Nitrogen Dioxide Pollution

Lillian Holt, Patrick Henry High School

Megan McGinnis, Patrick Henry High School

Sarah Riddle, Patrick Henry High School

# Energy and Environmental Engineering Special Awards



## High Enthusiasm:

EE 4 Photocatalytic Degredation of Methylene Blue Using Titanium Dioixde Coated Glass Beads

Cathryn (Rynn) Little, Patrick Henry High School

## Data Analysis and Statistics:

EE 1 The Effect of Fertilizers on the Hydrocarbon Degradation Ability of *Acinetobacter sp. NF22*

Cecilia Fraticelli, Glenvar High School

Nicholas Louvet, Glenvar High School

## Experimental Design:

EE 1 The Effect of Fertilizers on the Hydrocarbon Degradation Ability of *Acinetobacter sp. NF22*

Cecilia Fraticelli, Glenvar High School

Nicholas Louvet, Glenvar High School

## Project Concept:

EE 7 The Ability of Duckweed to Remove Heavy Metal Contamination from Water

Anna Frittman, Lord Botetourt High School

Aaron Henion, Cave Spring High School

# Energy and Environmental Engineering Place Awards



## 3rd Place (tie):

EE 5 The Effect of a Whale Fin Shaped Blade on the Energy Output of a Wind Turbine  
Charles (Bass) Beasley, Jr., Patrick Henry High School  
Maximillian Roberson, Patrick Henry High School

EE 6 Alternatives for Corn Based Biofuel  
Paulo Carey, Franklin County High School  
Parker Chapman, Franklin County High School

## 2nd Place (tie):

EE 1 The Effect of Fertilizers on the Hydrocarbon Degradation Ability of *Acinetobacter sp. NF22*  
Cecilia Fraticelli, Glenvar High School  
Nicholas Louvet, Glenvar High School

EE 8 The Effect of Natural Dyes on the Efficiency of Dye-Sensitized Solar Cells  
Josephine (Josie) Fraticelli, Glenvar High School  
Cole Price, Staunton River High School

## 1st Place:

EE 4 Photocatalytic Degredation of Methylene Blue Using Titanium Dioxide Coated Glass Beads  
Cathryn (Rynn) Little, Patrick Henry High School

# Engineering Mechanics A Special Awards



## Adaptability:

EM-A 2 Bluetooth-Controlled Lockbox  
Sarah Grace Stanley, Patrick Henry High School  
Silvia Wardell, Patrick Henry High School



# Engineering Mechanics A Place Awards



## 3<sup>rd</sup> Place:

EM-A 1 Head Driven Wheelchair  
Nelson Laine, Franklin County High School  
Bailey McNeil, Franklin County High School

## 2<sup>nd</sup> Place:

EM-A 8 Bluetooth-Enabled Webcam for Educators  
William (Maxwell) Stevens, Patrick Henry High School  
Tobias (Toby) Tate, Patrick Henry High School

## 1<sup>st</sup> Place:

EM-A 9 Rotating Weekly Pill Dispenser  
Kierstyn Stanley, Lord Botetourt High School  
Sydney Vokus, Lord Botetourt High School

# Engineering Mechanics B Place Awards



## 3<sup>rd</sup> Place (tie):

EM-B 2 Walk Safe Cane  
James (Ford) Beasley, Patrick Henry High School  
Declan Morrill, Patrick Henry High School

EM-B 6 Robotic Corona Virus Testing  
Merryn Isbell, Patrick Henry High School  
Lillian (Libby) Jamison, Patrick Henry High School

## 2<sup>nd</sup> Place:

EM-B 4 Electronic Doorman  
Troy (Andrew) Harmon, Patrick Henry High School  
Micah Keyser-Rothgery, Patrick Henry High School

## 1<sup>st</sup> Place:

EM-B 9 3D Printed Centrifuge  
Chloe Beasley, Lord Botetourt High School  
Parker Hudson, Lord Botetourt High School

# Engineering Mechanics C Place Awards



## 3<sup>rd</sup> Place (tie):

EM-C 5 Smart Pet Feeder  
Andrew Gloudemans, Staunton River High School

EM-C 1 The Whelevator  
Roman Ciulla, Franklin County High School  
Conner Deering, Franklin County High School

## 2<sup>nd</sup> Place:

EM-C 2 UV Light Sanitation Hood  
Sydnee Durham, Patrick Henry High School  
Ruby Isbell, Patrick Henry High School

## 1<sup>st</sup> Place:

EM-C 6 The COVID Bot  
Fady Abdelmalak, Salem High School  
Ethan Fouch, Lord Botetourt High School

# Engineering Mechanics D Special Awards



## Project Design:

Robert Berry, Patrick Henry High School  
John Paul (JP) Prusakowski, Patrick Henry High School

## Project Concept:

Benjamin Anderson, Patrick Henry High School  
Jonah Mroz-Roakes, Patrick Henry High School

## Creativity:

Riley Kerr, Patrick Henry High School

## Use of Technology:

Griffin Kauffman, Patrick Henry High School  
Riley VanAken, Patrick Henry High School

## Determination and Persistence:

Trinity Breedlove, Patrick Henry High School  
Cameron Snyder, Patrick Henry High School

## Enthusiasm:

Charles Meidlinger, Patrick Henry High School

## Use for Everyday Applications:

Nathan Sprouse, Cave Spring High School  
Ethan Su, Hidden Valley High School

## Most Promising Future Development:

Matthew Scarlatescu, Hidden Valley High School

# Engineering Mechanics D Place Awards



## 3<sup>rd</sup> Place:

EM-D 3 Mini Theremin  
Riley Kerr, Patrick Henry High School

## 2<sup>nd</sup> Place:

EM-D 7 Plant Watering Robotic Arm  
Nathan Sprouse, Cave Spring High School  
Ethan Su, Hidden Valley High School

## 1<sup>st</sup> Place (tie):

EM-D 4 Mini Wind Turbine  
Griffin Kauffman, Patrick Henry High School  
Riley VanAken, Patrick Henry High School

EM-D 8 Room Occupancy Tracker  
Matthew Scarlatescu, Hidden Valley High School

# Materials Science Special Awards



## Promising Future Scientists:

MS 5 The Effect of Carbon Nanotubes on the Tensile Strength and Conductivity of *Bombyx mori* Silk  
Benjamin Collier, Patrick Henry High School  
Emily Kiser, Staunton River High School

## Perserverance Against Difficulties:

MS 1 Investigating Various Properties of a Rubber Polymer Produced from Sulfur and Canola Oil  
Reese Robers, Patrick Henry High School  
Emma Seidel, Patrick Henry High School

## Most Promising Data for Future Study:

MS 3 The Effect of Nanoparticles on the Properties of a Chitosan-Alginate Polymer  
Jasmine Walker, William Fleming High School

## Outstanding Presentation:

MS 2 The Production of Fabric from *Pleurotus eryngii* and *Ganoderma lingzhi* Mycelia  
Reesa Devers, Patrick Henry High School  
Taylor Frazier, Patrick Henry High School

# Materials Science Place Awards



### 3<sup>rd</sup> Place (tie):

MS 4 The Effect of Natural Polymers on the Sustainability of Adhesive Hydrogels for Tissue Repair  
Katherine Cross, Lord Botetourt High School  
Haley Day, William Byrd High School

MS 6 The Antibacterial Effect of Adding Metal Nitrates to a Sodium Alginate Hydrogel  
Sarah Spradlin, Staunton River High School

### 2<sup>nd</sup> Place:

MS 7 The Effect of Polyol to Diisocyanate Ratios on the Sound Absorption of Polyurethane Foam  
Anna Halsdorf, Patrick Henry High School  
Penelope Smith, Patrick Henry High School

### 1<sup>st</sup> Place:

MS 8 The Application of a Chitosan Cross-linked Poly(acrylic acid) Hydrogel in the Removal of a Model Pollutant from an Aqueous Solution  
Rebecca Qiu, William Byrd High School  
Ainsley Robertson, Cave Spring High School

# Microbiology A Special Awards



### Most Creative Study:

Clara Higgins, Patrick Henry High School  
Abigail Hunter, Patrick Henry High School  
Olivia Reichardt, Patrick Henry High School

### Most Promising Future Study:

Elliott (Ellie) McClung, Lord Botetourt High School  
Heidi Thompson, Cave Spring High School

### Outstanding Oral Presentation:

Elisabeth Tershak, Patrick Henry High School  
Isabella (Bella) Whittle, Patrick Henry High School

### Outstanding Oral Presentation:

Faith Kuehl, Patrick Henry High School  
Annika Plunkett, Patrick Henry High School

### Best Understanding of the Scientific Method:

Nate Faulkner, Cave Spring High School  
Christina Okenquist, Northside High School

# Microbiology A Place Awards



## 3<sup>rd</sup> Place:

MI-A 3 Demographics of Crowdsourcing Compared to Clinical Sample Collection  
Hannah Peters, Franklin County High School

## 2<sup>nd</sup> Place:

MI-A 8 The Synergistic Effect of Pomegranate Rind Extract and Ciprofloxacin on the Growth of *E. coli*  
Reese Redford, Salem High School

## 1<sup>st</sup> Place:

MI-A 1 The Effect of *Melaleuca alternifolia* EO on the Growth of *E. coli*  
Faith Kuehl, Patrick Henry High School  
Annika Plunkett, Patrick Henry High School

# Microbiology B Special Awards



## Best Methodology:

MI-B 2 The Use of a Fluorescent pH-Biosensor to Image Yeast Organelles  
Grace Kahoun, Patrick Henry High School  
Emma Thielecke, Patrick Henry High School

# Microbiology B Place Awards



## 3<sup>rd</sup> Place (tie):

MI-B 4 The Effect of Clove Oil on the Growth of *E. coli*  
Zane Ellis, Staunton River High School  
Thomas (TJ) Hinson, Salem High School

MI-B 5 The Synergistic Effect of Cinnamon Bark Oil and Chloramphenicol on the Growth of *E. coli*  
Ayden McNulty, William Fleming High School  
Sofia Silverglate, William Fleming High School

## 2<sup>nd</sup> Place:

MI-B 7 The Effect of *Trametes vericolor* Infused Bandages on *Staphylococcus epidermidis*  
Emma Kate Greer, Patrick Henry High School  
Cynthia Lin, Franklin County High School  
Jennie Pham, William Fleming High School

## 1<sup>st</sup> Place:

MI-B 2 The Use of a Fluorescent pH-Biosensor to Image Yeast Organelles  
Grace Kahoun, Patrick Henry High School  
Emma Thielecke, Patrick Henry High School

# Plant Sciences A Special Awards



## Perseverance:

PS-A 9 The Effect of Benzyl Isothiocyanate Concentration on the Germination and Growth of *Raphanus sativus* and *Lamium purpureum*  
Kaleb Fricke, William Fleming High School  
Autumn O'Connor, Patrick Henry High School

## Most Relevant:

PS-A 1 The Effect of Silver Nanoparticles on the Tobacco Mosaic Virus  
Sara Drewry, Patrick Henry High School

# Plant Sciences A Place Awards



## 3<sup>rd</sup> Place:

PS-A 5 The Allelopathic Effect of *A. millefolium* on the Germination and Growth of *T. aestivum*  
Mieko DeKorse, Patrick Henry High School  
Chloe DeKorse, Patrick Henry High School

## 2<sup>nd</sup> Place:

PS-A 3 The Autotoxic Effect of *P. americana*  
Grace Bowman, Franklin County High School

## 1<sup>st</sup> Place (tie):

PS-A 1 The Effect of Silver Nanoparticles on the Tobacco Mosaic Virus  
Sara Drewry, Patrick Henry High School

PS-A 6 The Effect of an Invasive Species-Derived Herbicide on Other Inhibitory, Non-Native Flora  
Ryan Mollin, Franklin County High School

# Plant Sciences B Place Awards



## 3<sup>rd</sup> Place:

PS-B 9 The Allelopathic Effect of *P. persica* on the Germination & Growth of *F. ananassa*  
Joshua Ruppel, Patrick Henry High School

## 2<sup>nd</sup> Place:

PS-B 1 The Synergistic Allelopathic Effect of Extracts from Two Invasive Species on Germination and Growth of *E. hystrix*  
Daniel Han, Cave Spring High School  
Carson Ray, Cave Spring High School

## 1<sup>st</sup> Place:

PS-B 3 The Allelopathic Effect of *C. esculentus* v. *chufa* on the Germination & Growth of *L. vulgaris*  
Aidan Mayhue, Lord Botetourt High School  
Emma Pope, Glenvar High School

# Systems Software A Special Awards



## Great Commercialized Potential:

SS-A 4 The Use of Python to Count Blood Cells  
Tristen (Jack) David, Franklin County High School  
Tyler VanDyke, Craig County High School

## Best Organization and Teamwork:

SS-A 5 Using Python to Create a Tweet Algorithm Based on Identified Trends  
Amelia Kitt, Patrick Henry High School  
Chase Sweeney, Patrick Henry High School

## Outstanding Oral Presentation:

SS-A 1 Encryption and Decryption of Messages using Steganography in Python  
Spencer Kearns, Staunton River High School  
Abby Wyatt, Staunton River High School

# Systems Software A Place Awards



## 3<sup>rd</sup> Place:

SS-A 2 Integrated Calendar  
Lucas Mann, Franklin County High School  
Forrest Moorman, Franklin County High School

## 2<sup>nd</sup> Place:

SS-A 6 Programming a Game in Python  
William (Alexander) Branscom, Patrick Henry High School  
Anna West, Patrick Henry High School

## 1<sup>st</sup> Place:

SS-A 3 Verto.exchange  
Tate Berenbaum, Salem High School

SS-A 1 Encryption and Decryption of Messages using Steganography in Python  
Spencer Kearns, Staunton River High School  
Abby Wyatt, Staunton River High School



# Systems Software B Special Awards



## **Innovation:**

Stephen (Frank) Andes, Patrick Henry High School  
Owen Himmel, Patrick Henry High School

## **Most Original Software:**

Shane Cockram, Franklin County High School  
Liam May, Franklin County High School

## **Most Helpful to Society:**

Alex Kurtz, Franklin County High School  
Eliza Quesenberry, Franklin County High School

## **Most Relevant to Society:**

Brayden Whitlow, Franklin County High School  
Timothy Wilson, James River High School

## **Most Likely to be Hired by the CIA:**

Stephen (Frank) Andes, Patrick Henry High School  
Owen Himmel, Patrick Henry High School

# Systems Software B Place Awards



## **3<sup>rd</sup> Place (tie):**

SS-B 4 Web Scraping Within Python to Enhance Online Shopping  
Joseph Sandzimier, William Byrd High School  
Jacob Tozier, Cave Spring High School

## **SS-B 1 Time Management Assistance Program**

Shane Cockram, Franklin County High School  
Liam May, Franklin County High School

## **2<sup>nd</sup> Place (tie):**

SS-B 2 Scholarship Finder  
Jackson Konstance, Hidden Valley High School  
Cole Konstance, Hidden Valley High School

## **SS-B 6 Utilizing Python and Machine Learning to Analyze the Validity of News Articles**

Brayden Whitlow, Franklin County High School  
Timothy Wilson, James River High School

## **1<sup>st</sup> Place (tie):**

SS-B 3 Transferring Text to Auditory Language for the Visually Impaired  
Alex Kurtz, Franklin County High School  
Eliza Quesenberry, Franklin County High School

## **SS-B 5 Web Scraping as a Means of Understanding Digital Footprints**

Stephen (Frank) Andes, Patrick Henry High School  
Owen Himmel, Patrick Henry High School