

# WV-INBRE NEWSLETTER

Volume 23  
Fall/Winter 2017



## Dr. John E. Hall was the keynote speaker at the 2017 WV-INBRE Summer Research Symposium

Undergraduate college students, the majority from West Virginia, showcased their summer research projects at Marshall University on July 27th, 2017 as part of the 16th Annual West Virginia IDeA Network for Biomedical Research (WV-INBRE) Summer Research Symposium. During the 2017 Summer Program, WV-INBRE supported twenty-eight undergraduate interns, two faculty fellows, and five high school science teachers from the West Virginia HSTA program. Seventeen interns and one faculty fellow carried out their research at West Virginia University. Eleven interns and one faculty fellow conducted their research at Marshall University. The high school science teachers conducted their research at West Liberty University, Marshall University and Bluefield State College.

The research projects presented at the symposium were conducted under the direction of faculty mentors during an intensive 9-week period. The projects includ-



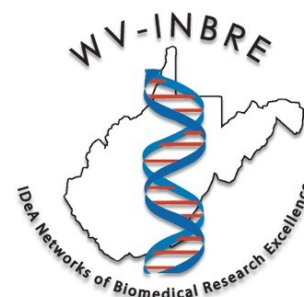
*Dr. John E. Hall, PhD*

ed studies on the treatment of cancer and depression, endometriosis, genetics of obesity and type 2 diabetes, nicotine and opioid addiction, and the pathophysiology and treatment of infectious diseases among others.

WV-INBRE, which is designed to support biomedical research in the state, is funded by a grant from the National Institutes of Health (NIH) to Marshall University, in cooperation with West Virginia University and fourteen other colleges and universities in the state.

The summer program allows students enrolled in the Primarily Undergraduate Institutions (PUIs) in the WV-INBRE network research opportunities in labs at both Marshall University and West Virginia University. In addition to the formal research training they receive, students attend workshops and seminars aimed at helping them understand the research process and graduate education. The morning session of the symposium began with oral presentations by: Amanda Stewart, Ph.D., Assistant Professor of Biology, Bethany College; Summer Research Program Fellow. Jeffery Johnson, high school science teacher at Mount View High School in Welch, WV; WV-INBRE/HSTA summer research fellow. Josiah Bosley, Kristen Haggerty, Kristiana Sklioutovskaya-Lopez, and Grace Montgomery; summer research program interns.

*Continued on page 5*



### Network Partners of the WV-INBRE

### Lead Universities

Marshall University  
West Virginia University

### Predominantly Undergraduate Institutions (PUIs)

Alderson-Broaddus University  
Bluefield State College  
Concord University  
Davis & Elkins College  
Fairmont State University  
Glenville State College  
Shepherd University  
University of Charleston  
West Liberty University  
West Virginia School of Osteopathic Medicine  
West Virginia State University  
West Virginia Wesleyan College  
Wheeling Jesuit University

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## Message from the WV-INBRE Principal Investigator



As we enter into winter, I hope that everyone had a wonderful holiday season. It seems like the time we take to enjoy with family and friends goes by all too fast. The next thing you know – back to work! As I look back at 2017 for our WV-INBRE family, we have had several changes. Three of our West Virginia University Administrative Core members have retired; Jim Sheil, Program Coordinator; Mary Davis, Bioinformatics Core Director; and Bob Griffith, FRDA Program Director and WVU Summer Program Coordinator. We truly thank them all for their many years of service and the contributions they have made to help make WV-INBRE a successful program. All three have been with WV-BRIN and then WV-INBRE since the beginning of this IDeA program in 2001. Because of these retirements, we have made a few changes and additions to the leadership of WV-INBRE. Dr. Stan Hileman, WVU School of

Medicine, is our new Program Coordinator and Dr. Werner Geldenhuys, WVU School of Pharmacy, has replaced Dr. Griffith as Director of the FRDA program and WVU Summer Program Coordinator. Dr. Jim Denvir at Marshall University has become the new Director of the Bioinformatics Core and Neil Infante is assisting with bioinformatics needs at WVU.

We had a wonderful summer research program and symposium again this year with 28 undergraduate students from 11 of the 14 partner institutions conducting research at Marshall and West Virginia Universities. We also had two partner institution faculty fellows conduct research as part of the summer program. Dr. Amanda Stewart, Bethany College, worked in the laboratory of Dr. Vazhaikurichi Rajendran at WVU, and Dr. Dawn Turner, University of Charleston, worked with Dr. Jiang Liu at Marshall University. The summer symposium was held at Marshall University on July 27, 2017 with six oral and 82 poster research presentations being made. The keynote speaker was Dr. John E. Hall, Arthur C. Guyton Professor and Chair of the Department of Physiology and Biophysics at the University of Mississippi Medical Center, who talked about his research in the field of hypertension in obesity. Overall, a very informative and fun day!

It is also hard to believe that it is time to start working on

the WV-INBRE competitive renewal application. WV-INBRE is currently in Years 14-18 with our competitive renewal application due March 27, 2018. The Administrative Core has already begun working on the various components of the application, and we will be sending out requests for information and letters of support in the very near future. Please help us by providing the requested information and letters as soon as possible. We have very tight deadlines and need everyone's help to keep WV-INBRE going and growing. This program does a great deal for developing biomedical research infrastructure and providing research training for faculty and students across West Virginia, and everyone in the network plays important roles in making WV-INBRE a success.

Let me also remind everyone that when you publish research or make a presentation based on WV-INBRE supported research or equipment purchased with WV-INBRE funds, please acknowledge support from NIH grant P20GM103434 awarded to West Virginia INBRE. These acknowledgements of WV-INBRE support are critical for our effort to get WV-INBRE renewed. If you have any questions about how to word the acknowledgement, please don't hesitate to contact me.

I hope everyone has a healthy and successful 2018!





## WV-INBRE Highlights Dr. Horzempa at West Liberty University

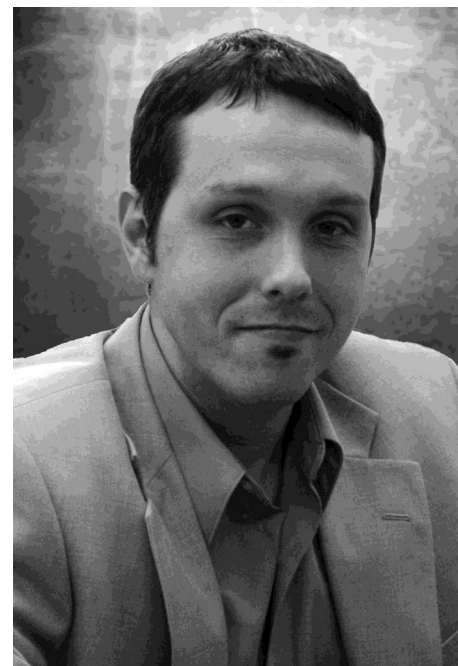
Joseph A. Horzempa, Ph.D. is an Associate Professor and Program Director of the MA/MS in Biology at West Liberty State University. He received his Doctorate degree in Biology from Duquesne University in 2006, his Master degree in Biology in 2002, and his Bachelor degree from California University of PA in 2000.

In his short career, he has authored over 30 peer-reviewed publications. Since being hired at West Liberty University in 2011, his laboratory has produced 14 publications that feature 98 student authors. In addition, more than one hundred research presentations have been given by students and members of his laboratory at scientific conferences. Students from Dr. Horzempa's laboratory have received a number of awards, grants, and fellowships for their research accomplishments, indicating both the significance of their findings, and the superior quality of their work. These accomplishments undoubtedly provided opportunities for students at West Liberty Uni-

versity that enhanced their educational experience. The experience provided through their research endeavors supported by the grants that he received enhanced student applications for post-graduate and professional education. This assertion is supported by the number of students from his laboratory that are now in professional or graduate schools.

The alumni of the "Horzempa Lab" include five graduates that are now in medical school (one has completed medical school and is now in her residency), three in dental school, eleven in a Master's or PhD program, ten in a Physician Assistant program, one in law school, and one former student is currently in a Doctor of Pharmacy program.

Dr. Horzempa's laboratory investigates erythrocyte invasion by *Francisella tularensis* – a dangerous pathogen capable of being used for bioterrorism. His work is currently focused on determining how *F. tularensis* bacteria are capable of invading red blood cells. Re-



Joseph A. Horzempa, Ph.D. is an Associate Professor at West Liberty University

cently, he showed that a protein secretion system (referred to as the "type VI" secretion system) is required for invasion. In addition, manipulation of the erythrocyte cytoskeletal protein, spectrin, is likely required for invasion. He is currently investigating whether type VI effectors interact with spectrin to mediate invasion of *Francisella* bacteria.

Another focus of Dr. Horzempa's laboratory is the discovery and characterization of novel antimicrobials and antibiotics from natural products. He is actively investigating various lead compounds isolated from various plant extracts that have been obtained from the National Center for Natural Products Research and other sources.





## WV-INBRE Interns from Marshall University



Front row, from left to right: Christopher Yopp (BSC), Miranda Poore (BSC), Kristiana Sklioutovskaya-Lopez (UofCh), Catherine Cavender (CU), Kaden Hudson (UofCh).  
Back row, from left to right: Josiah Bosley (WVWC), Michael Muller (WVWC), Tyler Halstead (UofCh), Shane Dempsey (SU), Nicholas Tate (AB), Gregory Thurman (UofCh).

## WV-INBRE Interns from West Virginia University



Front row, from left to right: Kelly Weaver (GSC), Emily Kennel (AB), Michelle Joseph (SU), Noor Qazi (BSC), Andrew Forino (AB), Hunter Aliff (WVSU).  
Second row, from left to right: Taylor Barnette (WVWC), Grace Montgomery (WVWC), Seth Bergeron (AB), McKenzie Keistler-Bergeron (AB).  
Third row, from left to right: MacKinzie Smith (D&E), Garrett Wilkins (WVWC), Austin Paul-Orecchio (BC), Ben Lanham (SU).  
Last row, from left to right: Catherine Bandak, John Veltman, Kristen Hagerty

WV-INBRE phase III (P20 GM103434) continues to support biomedical research that relies on Next Generation Sequencing (NGS) technology. NGS enables the rapid and relatively inexpensive high throughput sequencing of whole genomes, whole exomes, transcriptomes, transcription factor binding sites, and microbiomes. These analyses can enable the discovery of disease susceptibility variants, metabolic or signal transduction pathways, and changes to microbiome composition. In each year of phase III, WV-INBRE solicits NGS research applications through a request for applications. The solicitation is open to biomedical investigators at West Virginia University, Marshall University and WV primarily undergraduate institutions that are members of the WV-INBRE network. The intent of the program is to allow investigators to gather preliminary data for NIH grant applications.

For Y17, WV-INBRE has made NGS pilot awards to three network investigators. This year's awardees are:

- (1) Candice M. Brown, PhD, Department of Microbiology, Immunology, & Cell Biology at WVU. Project Title: The Gut Microbiome in Mouse Models of Stroke and Alzheimer's Disease.
- (2) Tamer E. Fandy, PhD, School of Pharmacy Pharmaceutical & Administrative Sciences at the University of Charleston. Project Title: Impact of DNA hypomethylating agents on H3K9/H3K56 acetylation in leukemia cells.
- (3) Brandon Henderson, PhD, Department of Biomedical Sciences at Marshall University. Project Title: Identifying transcriptional changes by nicotine and opioids in dopaminergic neurons.

WV-INBRE will issue a new request for applications for these awards in December 2017. We anticipate making five \$15,000 awards in August 2018. We advise applicants to discuss their proposals with the directors the Genomics and Bioinformatics Cores (Don Primerano, Jim Denvir and Niel Infante) in order to clarify experimental design, expectations and cost. Genomic analyses require sophisticated analytical tools, some of which are commercial products while others are publically available. WV-INBRE continues to provide access to Ingenuity Pathway Analysis (IPA) software for network investigators.

### Dr. John E. Hall was the keynote speaker at the 2017 WV-INBRE Summer Research Symposium (continued)

*Continued from face page*

This year's summer research symposium featured keynote speaker was John E. Hall, PhD, Arthur C. Guyton Professor & Chair of the Department of Physiology and Biophysics and Director of the Mississippi Center for Obesity Research at The University of Mississippi Medical Center. His presentation was entitled: "Mechanisms of hypertension in obesity/metabolic syndrome: a growing challenge to our health care system (... and a journey from West Virginia to Mississippi)".

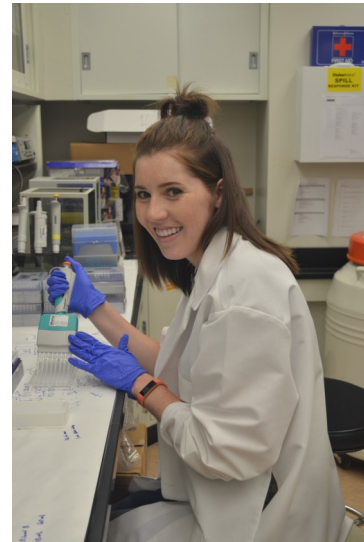
Following a luncheon, the symposium continued with poster presentations by students and faculty. There were a total of 82 posters. Participants presenting posters included: summer undergraduate interns and faculty fellows from the PUIs who conducted research at West Virginia University and Marshall University during the 9-week summer research program, and students and faculty conducting research at their home institutions. The high school science teachers supported by the WV-INBRE/HSTA initiative also presented posters.



**WV-INBRE participants working in the labs**



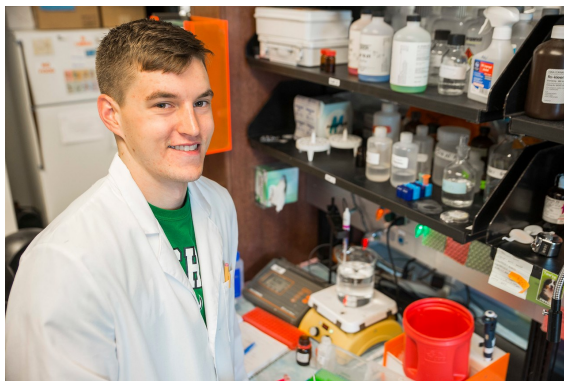
Catherine Cavender, Concord University, worked in Dr. Santanam's lab at Marshall University



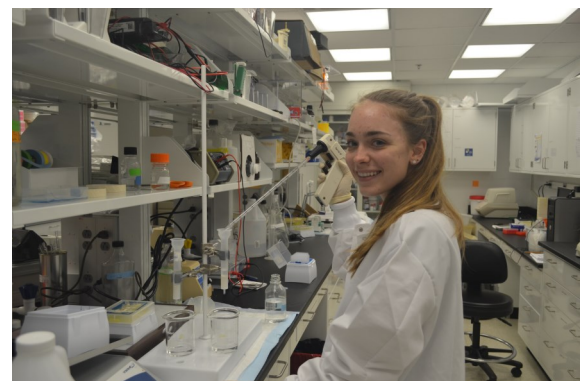
Mackenzie Bergeron, Alderson Broaddus College, worked in Dr. Vona-Davis' lab at West Virginia University



Christopher Yopp, Bluefield State College, worked in Dr. Yu's lab at Marshall University

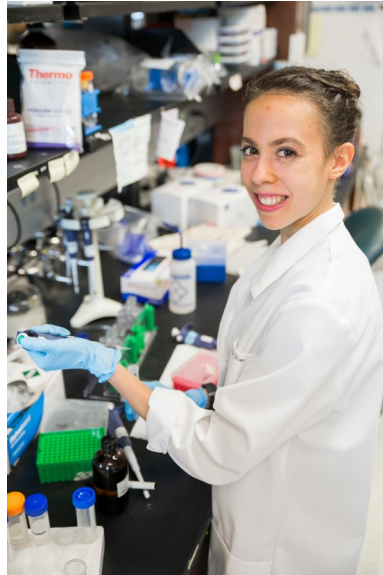


Michael Mueller, West Virginia Wesleyan College, worked in Dr. Salisbury's lab at Marshall University



Grace Montgomery, West Virginia Wesleyan, worked in Dr. Leonardi's lab at West Virginia University





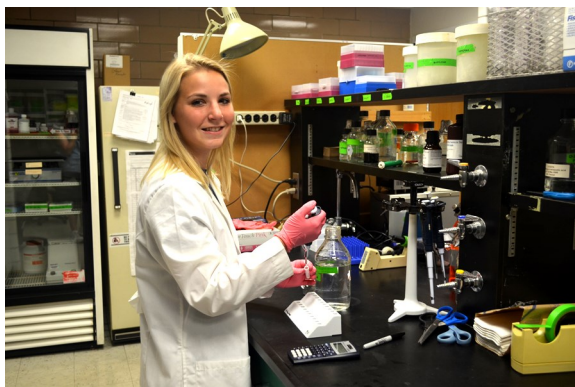
Kristiana Sklioutovskaya-Lopez, University of Charleston, worked in Dr. Kim's lab at Marshall University



Catherine Bandak, West Virginia Wesleyan College, worked in Dr. Chantler's lab at West Virginia University



Nicholas Tate, Alderson-Broaddus University, worked in Dr. Koc's lab at Marshall University



Emily Kennell, Alderson Broaddus College, worked in Dr. Hillgartner's lab at West Virginia University

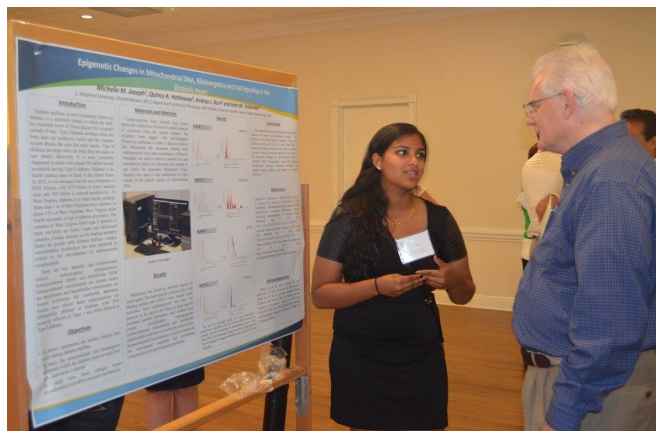


Tyler Halstead, University of Charleston, worked in Dr. Valentovic's lab at Marshall University

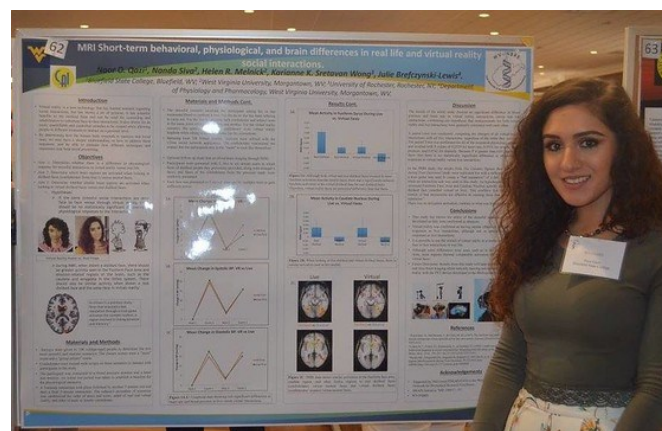




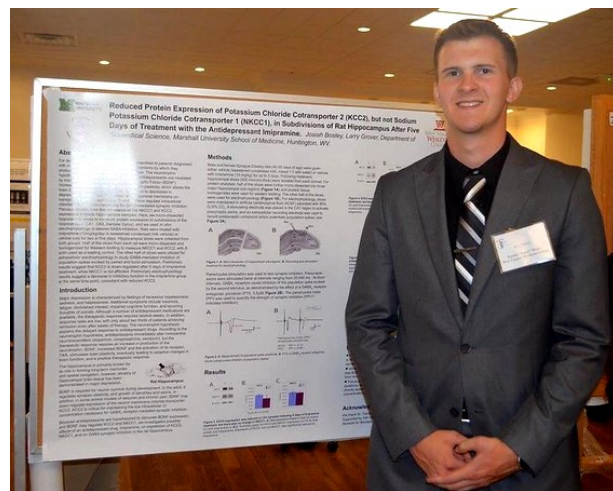
## Summer Participants Presenting Posters at WV-INBRE Symposium



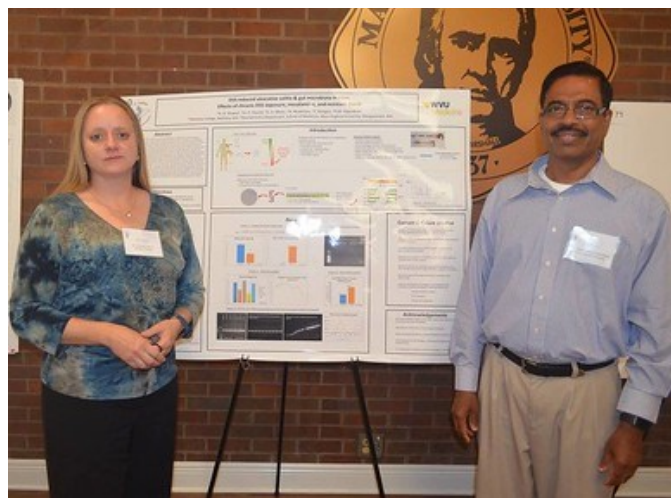
Michelle Joseph, Shepherd University, explains her poster entitled “The Influence of Epigenetic Changes in Mitochondrial DNA on Bioenergetics and Cell Signaling Mechanisms” to Dr. Warburton.



Noor Qazi, Bluefield State College, stands beside her poster entitled “MRI Short-term behavioral, physiological, and brain differences in real life and virtual reality social interactions.”



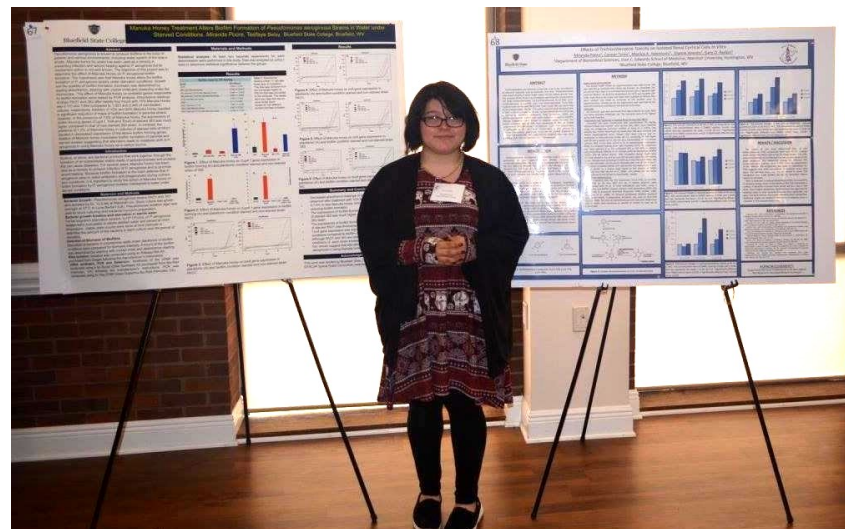
Josiah Bosley, West Virginia Wesleyan College, stands beside his poster entitled “Reduced Protein Expression of Potassium Chloride Cotransporter 2 (KCC2), but not Sodium Potassium Chloride Cotransporter 1 (NKCC1), in Subdivisions of Rat Hippocampus After Five Days of Treatment with the Antidepressant Imipramine.”



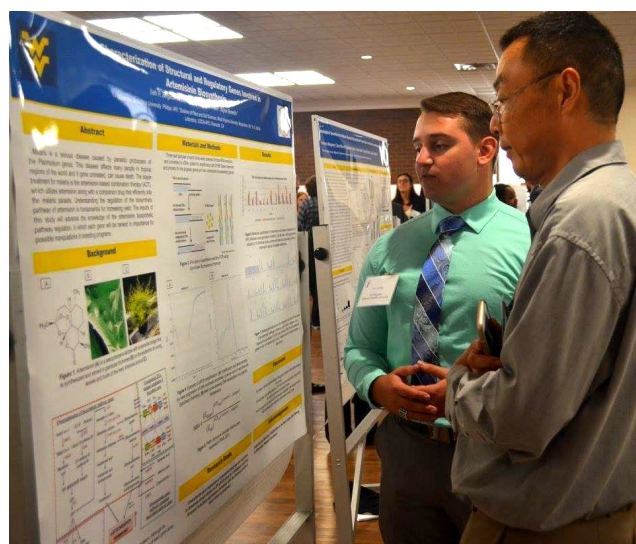
Amanda Stewart, one of the WV-INBRE Summer Fellows, and Dr. Rajendran, her mentor, stand by her poster entitled “DSS-induced ulcerative colitis and gut microbiota in mice: effects of chronic DSS exposure, mesalamine, and resistant starch.”



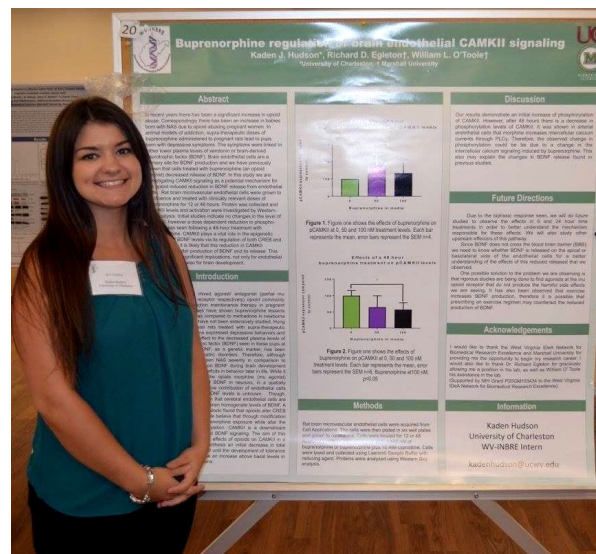
## Summer Participants Presenting Posters at WV-INBRE Symposium



Miranda Poore, Bluefield State College, stands between both of her posters that she presented. The first one was entitled “Manuka Honey Treatment Alters Biofilm Formation of *Pseudomonas aeruginosa* Strains in Water under Starved Conditions.” and the second one was entitled “Trichlorobenzene Toxicity on Isolated Renal Cortical Cells (IRCC).”



Seth Bergeron, Alderson-Broaddus College, discusses his poster entitled “Characterization of Structural and Regulatory Genes Involved in Artemisinin Biosynthesis.” with Dr. Chen, a Professor at A-B and a major awardee of the WV-INBRE program.



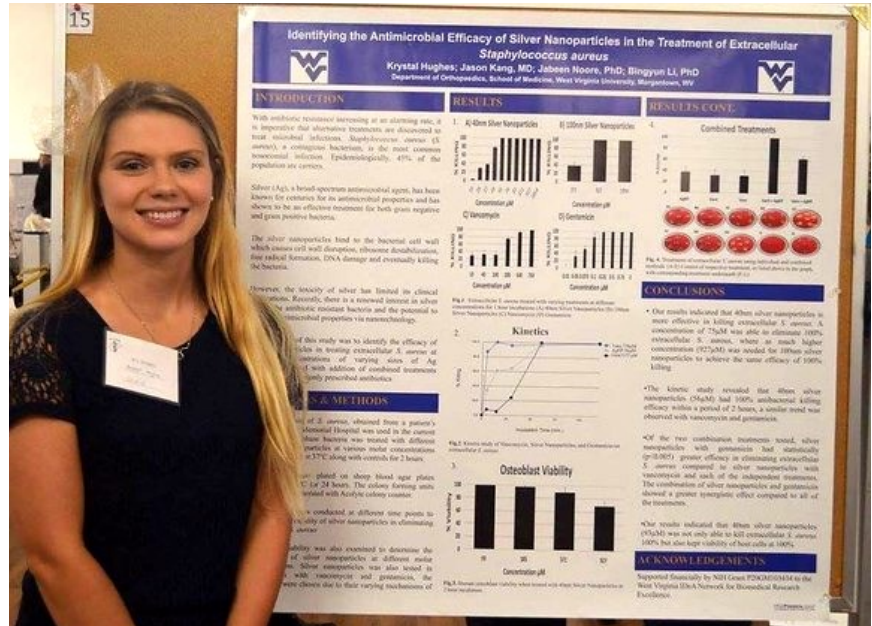
Kaden Hudson, University of Charleston, stands beside her poster entitled “Buprenorphine regulation of brain endothelial CAMK signaling.”



## WV-INBRE Provides Biomedical Research Opportunities to HSTA Scholars During the Academic School Year

The partnership between WV-INBRE and the Health Sciences & Technology Academy (HSTA) program is focused on encouraging undergraduate students to pursue biomedical research opportunities. Those who have demonstrated an interest in biomedical research through their participation in the HSTA program while in high school are eligible to participate in this program. WV-INBRE funds select students to further develop their interest in biomedical research once they enroll at West Virginia University, Marshall University or one of the Primarily Undergraduate Institutions (PUIs).

During the 2017-2018 academic year, 14 HSTA scholars were selected to participate in this program as WV-INBRE student interns. Eight student interns are participating at the PUIs, 5 interns at West Virginia University, and 1 intern at Marshall University.



*Krystal Hughes, a HSTA Scholar participant at WVU, worked in Dr. Paul Lockman's lab*

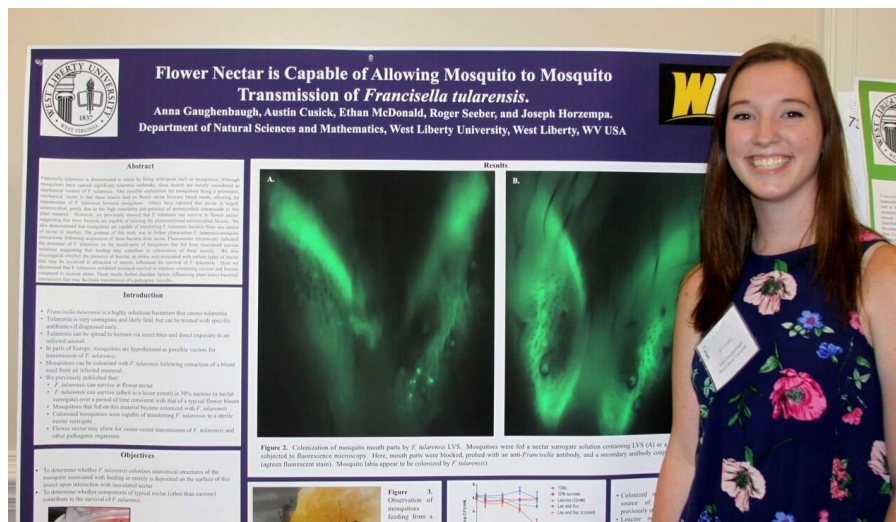
The eight student interns at the PUIs are: Justice Jefferson, working with Dr. Yi Charlie Chen at Alderson-Broaddus University; Gezelle Brown, Raenel Crenshaw, and Maya Patterson, working with Dr. Tesfaye Belay at Bluefield State College; Franklin Lyons,

working with Dr. Rebecca Linger at University of Charleston; and Anna Gaughenbaugh, Jenna Ingram, and Brielle Taylor working with Dr. Joseph Horzempa at West Liberty University.

The five student interns at West Virginia University are: Krystal Hughes working with Dr. Paul Lockman; Helen Melnick working with Dr. Julie Breczynski-Lewis; April Strahin and Mya Vannoy working with Dr. Vagner Benedito; and Chase Wilson working with Dr. Bungyun Li.

One student intern, Sabel Meadows, is working with Dr. Nalini Santanam at Marshall University.

All student interns presented the results of their research projects at the 16th Annual WV-INBRE Summer Research Symposium at Marshall University in Huntington, WV on July 27, 2017.



*Anna Gaughenbaugh, a HSTA Scholar participant at the PUI, worked with Dr. Horzempa at West Liberty University*



# ANNOUNCEMENTS

## SUMMER 2018 PAID RESEARCH OPPORTUNITY FOR HIGH SCHOOL SCIENCE EDUCATORS

WV-INBRE will provide funding for nine-week biomedical science research internship positions for high school science educators. A maximum of 5 internships will be available. HSTA teachers or teachers from HSTA-affiliated schools may be given preference in the selection process. Internships run from May 29 through July 31, 2018. Based on the high school's academic calendar, start dates are flexible; however, employment dates end July 31, 2018. Compensation of \$9,000 (\$1000/week) will be provided for the full nine weeks, or \$1000 for each 40 hour week worked. For more information, go to the WV-INBRE website at <http://www.wv-inbre.net/summerprogram> and click on "For High School Educators Information".

More information will be provided about the program and you will be able to view the Mentors Abstract Directories for researchers at WVU and Marshall University and at the WV-INBRE's partner institutions. These directories can be viewed online at their appropriate link and the application can be filled out online under the "Application link". Deadline for application is March 16, 2018.

For more information, contact:

Valerie Watson, [vwatson@hsc.wvu.edu](mailto:vwatson@hsc.wvu.edu) or (304) 293-4120.

## SAVE THE DATE

17<sup>th</sup> ANNUAL WV-INBRE  
SUMMER RESEARCH SYMPOSIUM  
**JULY 31, 2018**  
MORGANTOWN, WV



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