



New West Virginia INBRE Research Awards for 2015-2016

Several new research awards have been granted for 2015-2016. These include two major Predominantly Undergraduate Institution (PUI) research awards, five Faculty Research Development Awards (FRDAs), five Center for Natural Products Research Pilot Grants and five Genomics Core Next Generation Sequencing Grants. A list of the awardees, their project titles and their institutions are shown below. The major PUI research awards are for two years and the remainder of the awards is funded only for 2015-2016.

Major PUI Research Awards

Dr. Evan Lau, Microbial diversity of mouse oral cavity and lung after *Pseudomonas* infection, West Liberty University

Dr. James Walters, Determining regulation of lipid absorption in vertebrate intestine, Bluefield State College

Faculty Research Development Awards

Dr. Albert Magro, Degradation of complement components by MMPs in

apoptotic glioblastoma cells, Fairmont State University

Dr. Rebecca Linger, Protein Expression and Enzymatic Analyses of *Burkholderia cenocepacia* LlpE, University of Charleston

Dr. Natalia Omelchenko, Effect of nicotine on neural tube development, West Liberty University

Dr. Melanie Sal, Effect of alternate media formulations on growth of *Borrelia burgdorferi*, West Virginia Wesleyan College

Dr. Deanna Schmitt, The mechanism of action of resazurin, a novel antibiotic, West Liberty University

Center for Natural Products Research Pilot Grants

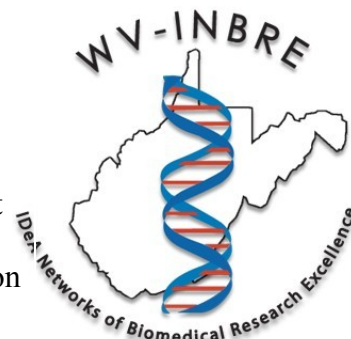
Dr. Tesfaye Belay, Actions of AHCC in regulation of stress hormones in a mouse model, Bluefield State College

Dr. Joseph Horzempa, Characterization and discovery of novel antibiotics from natural products, West Liberty University

Dr. Young Kim, Discovery and synthesis of heterocyclic natural compounds toward cancer research, Bluefield State College

Dr. Yi Charlie Chen, AHR signaling pathways in myricetin-inhibited ovarian cancer cells, Alderson Broaddus University

Dr. Luke Huggins, Identification of MRSA strains affected by extracts of tyrol knapweed, West Virginia Wesleyan College



Network Partners of the WV-INBRE

Lead Universities

Marshall University
West Virginia University

Predominantly Undergraduate Institutions (PUIs)

Alderson-Broaddus College
Bethany College
Bluefield State College
Concord University
Davis & Elkins College
Fairmont State University
Glennville State College
Mountain State University
Salem International University
Shepherd University
University of Charleston
West Liberty University
West Virginia State University
West Virginia Wesleyan College
Wheeling Jesuit University

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Message from the WV-INBRE Principal Investigator - Gary O. Rankin, Ph.D. -

Time certainly passes by fast! It is hard to believe that we are already in the second year of the third 5-year phase of WV-INBRE, with Y15 starting on August 1, 2015. Somewhere along the way, we had a fall season and now are progressing quickly into winter. And it is exciting to see all of the activities going on in WV-INBRE across the state.

We ended the summer with the very successful 14th Annual WV-INBRE Summer Research Symposium hosted this year by Marshall University. Twenty-seven summer interns conducted their summer research at Marshall University (10 interns) and West Virginia University (17 interns). Dr. Gary Morris, Glenville State College, worked with Dr. Travis Salisbury at Marshall University as our only faculty fellow this year, and Dr. Morris is a returning faculty fellow continuing his work with Dr. Salisbury. There were five Heath Sciences and Technology Academy (HSTA) high school science teachers participating in the summer research program this year at Marshall University (1), West Virginia University (2) and Shepherd University (2). This year the Summer Research Symposium was held at Marshall University on July 27, 2015, with Dr. Gabriel Navar, Professor and Chair, Department of Physiology, Tulane University School of Medicine serving as the keynote speaker. Dr. Navar is also a COBRE principal investigator. He gave an inspiring presentation about his path to becoming a scientist and his research in hypertension. The symposium was well

attended with six oral and 78 poster presentations. This was truly a fun and exciting day, and I hope that everyone who attended enjoyed themselves and learned a lot.

With the start of the Y15 funding cycle, we now have all five major PUI research awards funded. These major awards fund up to \$125,000 per year to support a sustainable research project in the principal investigator's laboratory. WV-INBRE has also funded five Faculty Research Development Awards (FRDAs) and five Center for Natural Products Research Pilot Grants for Y15. See the article in this newsletter for more details.

The Southeast Regional IDeA meeting was held November 11-13, 2015 at the Beau Rivage Resort & Casino in Biloxi, Mississippi. The meeting was hosted by the Mississippi IDeA programs and attended by several WV-INBRE faculty and students. Drs. Gary Rankin and Nalini Santanam (Marshall University), Drs. Tesfay Belay and James Walters (Bluefield State College), Dr. Qing Wang (Shepherd University), and Dr. Joseph Horzempa (West Liberty University), plus several of their students, attended the meeting and presented research posters. Dr. Horzempa also delivered an invited oral presentation in the Infectious Disease/Immunology Section. The meeting started with a reception at the Maritime and Seafood Industry Museum Wednesday evening, followed on Thursday and Friday mornings with a number of scientific sessions, including poster ses-

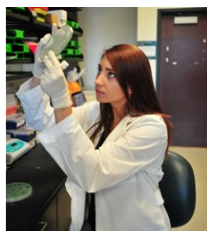


sions. This was a wonderful opportunity to share what we are doing in West Virginia with the rest of the Southeast Region IDeA programs and NIH officials who attended the meeting. To top off the meeting, Devin Sindeldecker, a student working in Dr. Horzempa's laboratory won 2nd Place for undergraduate presentations!

While there are plenty of activities scheduled for the rest of Y15, I hope everyone has a wonderful holiday season and a Happy New Year and gets to spend time with their family and friends during this special time of the year!

Twenty-seven WV-INBRE Students Participate in 14th Annual Summer Research Program and Symposium

The 2015 WV-INBRE Summer Research Program ran from May 26 till July 27. Twenty-seven



talented undergraduate students from eleven of the thirteen Predominantly Undergraduate Institutions (PUIs) of the WV-INBRE network participated in the WV-INBRE Summer Research Internship Program at West Virginia University and Marshall University. Ten interns worked at Marshall University and seventeen completed their internship at WVU. Over the summer, the interns gained valuable, hands-on experience doing graduate-level research in the labs of their mentors. The interns worked in state-of-the-art facilities on research projects related to cancer, cardiovascular disease, obesity and diabetes, neuroscience, toxicology and environmental health, and infectious diseases. They also learned how to share their findings at a scientific meeting and to network, all of



which will help them build academic competitiveness for graduate school. One of the Summer Research Program goals is to promote awareness of graduate degree programs and careers in biomedical research.

One faculty member from the PUIs also spent his summer conducting biomedical research as part of the WV-INBRE Summer Research Fellowship Program. Dr. Gary Morris, Associate Professor of Biology, Science and Mathematics

at Glenville State College, worked at Marshall University under the mentorship of Dr. Travis Salisbury. Five high school science teachers sponsored by the WV-INBRE/HSTA initiative also conducted biomedical research at West Virginia University, Marshall University and Shepherd University.

Interns and faculty fellows presented the results of their research at the 14th Annual WV-INBRE Summer Research Symposium on July 27 at Marshall University. Opening remarks were delivered by Dr. Joseph Shapiro, Dean, Joan C. Edwards School of Medicine, Marshall University and Dr. Gary Rankin, WV-INBRE Principal Investigator. The morning session of the symposium began with oral presentations by:

Dr. Gary Z. Morris, Associate Professor of Biology, Science and Mathematics Department, Glenville State College; Summer Research Program Fellow.

Megann Boone, Robert Jesmer, Seth Deskins, and Leah Figurski; Summer Research Program Student Interns. And Olivia Boskovic; a High School Science Teacher from Huntington High School; a WV-INBRE/HSTA Fellow.

This year's Summer Research Symposium's featured keynote speaker was L. Gabriel Navar, PhD, Professor and Chair, Department of Physiology; and Director, Center of Biomedical Research Excellence in Renal Biology of Tulane University School of Medicine. His presentation was entitled: "Cardiovascular Health, High Blood Pressure and Kidney Function". Dr.

Navar is an internationally recognized physiologist with expertise in renal biology and hypertension. He received his Ph.D. in 1966 from the University of Mississippi under the direction of Dr. Arthur Guyton. He served on the faculty of the University of Mississippi and the University of Alabama at Birmingham before joining Tulane University in 1988. He currently serves as Director of the Center for Biomedical Research Excellence in Hypertension and Renal Biology and Professor and Chair of the Department of Physiology. Dr. Navar has concentrated his research on the hormonal and paracrine mechanisms that regulate renal hemodynamics, glomerular filtration rate, and sodium reabsorption, as they relate to the pathophysiology of hypertension and diabetes. Dr. Navar has had leadership roles serving as Councilor and President of the American Physiological Society (APS) (1998-99) and with the Association of Chairs of Departments of Physiology (1996-97). He also served as a member and chair of the Leadership Committee of the Council for High Blood Pressure Research of the American Heart Association. He has served on study sections (NIH, VA, and AHA) and on Editorial Boards for various journals including *American Journal of Physiology* and *Hypertension*. His work has been recognized and lauded by his peers, as evidenced by numerous awards. Dr. Navar's work has been funded primarily by grants from the NHLBI, NIDDK, and NIGMS. His is currently Director of the CoBRE award in Hypertension and Renal Biology.

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13th Annual WV-INBRE Summer Symposium (continued)

Following a luncheon, the symposium continued with poster presentations by students and faculty, which included a total of 78 posters. Participants presenting posters included: summer undergraduate interns and faculty fellows from the PUIs who conducted re-

search at WVU and Marshall University during the 9-week summer research program, and students and faculty conducting research at their home institutions. Five high school science teachers supported by the WV-INBRE/HSTA initiative also presented posters.



Continued from cover page:

Next Generation Sequencing Awards

Dr. Stephen Alway, Genome-wide Profiling of Sirtuin 1-Regulated Transcriptome in Satellite Cell regulated Muscle Repair in Obesity and Aging, West Virginia University

Dr. Heath Damron, Bordetella Pertussis vaccine development, West Virginia University

Dr. Shuo Wei, Identification of transcriptional targets of a novel ADAM-ephrin-Wnt signaling axis in neural crest induction, West Virginia University

Dr. Subha Arthur, The role of

high fat diet on intestinal nutrient and electrolyte transporters in a polygenic model of obesity. Marshall University

Dr. Ayman Shatnawi, ING4 a Novel Androgen Receptor Regulator in Prostate Cancer Development and progression. University of Charleston

ANNOUNCEMENT

WV-INBRE Announces 2016 Summer Faculty Fellowships

WV-INBRE is pleased to announce the availability of Summer Research Fellowships in biomedical research for faculty at the partner institutions in the WV-INBRE network. The 2016 Summer Research Program will run from May 23 till July 25, 2016 with the Summer Research Symposium to be held on July 25 at West Virginia University. A stipend of \$13,000 is paid to the fellow for the 9-week research experience. As in the past, positions are available for fellow-

ships at WVU Health Sciences Center and Marshall University. Application deadline is November 23, 2015. The online application can be found at:

http://www.wv-inbre.net/summerprogram/application_fellows/Default.aspx

If a faculty member is interested in applying for a fellowship, he/she should contact Elsa Mangiarua, Ph.D., to discuss his/her research interests. If the individual does not

have a specific mentor in mind at one of the institutions, she will then direct him/her to one or more mentors for further discussion.

Contact information for Dr. Mangiarua is:

Elsa I. Mangiarua, Ph.D.

WV-INBRE

Summer Research Program Director

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WV-INBRE Next Generation Sequencing (NGS) Small Grant Program Issues Five New Research Awards

The WV-INBRE program 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 and microbiomes. These analyses can lead to the discovery of disease susceptibility variants, metabolic or signal transduction pathways, and changes to microbiome composition. In each year of phase III, WV-INBRE will solicit 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 part of the WV-INBRE network. The intent of the program is to allow investigators to gather preliminary data for NIH grant applications.

Year 15 (Y15) applications were accepted in early 2015, ranked by external reviewers and approved by the WV-INBRE Administrative Core and the National Institute of General Medical Sciences (NIGMS). In Y15, WV-INBRE was able to make NGS awards to the following five network investigators:

Stephen Alway, PhD, Department of Exercise Physiology, West Virginia University School of Medicine. Project title: "Genome-wide Profiling of Sirtuin 1-Regulated Transcriptome in Satellite Cell regulated Muscle Repair in Obesity and Aging".

Subha Arthur PhD, Department of Clinical and Translational Science. Joan C. Edwards School of Medicine, Marshall University. Project title: "The role of high fat diet on intestinal nutrient and electrolyte transporters in a polygenic model of obesity".

F. Heath Damron, PhD, Department of Microbiology, Immunology & Cell Biology. West Virginia University School of Medicine. Project title: "Transcriptional Response to *Bordetella pertussis* infection and vaccination".

Ayman Shatnawi, PhD, School of Pharmacy, University of Charleston. Project title: "ING4, a Novel Androgen Receptor Regulator in Prostate Cancer Development and Progression".

Shuo Wei, PhD, Department of Biology, West Virginia University. Project Title: "Identification of transcriptional targets of a novel ADAM-ephrin-Wnt signaling axis in neural crest induction".

WV-INBRE will issue a new request for applications for NGS awards in January 2016. We anticipate making between 5 and 7 \$15,000 awards in July 2016. We advise applicants to discuss their proposal with the directors the Genomics and Bioinformatics Cores (Don Primerano, Mary Davis and Jim Denvir) in order to clarify experimental design, expectations and cost. Genomic analyses require sophisticated analytical tools, some of which are commercial products while others are publicly available. The WV-INBRE network has acquired Partek Genomics Suite and Ingenuity Pathway Analysis (IPA) and shares these tools with network investigators.

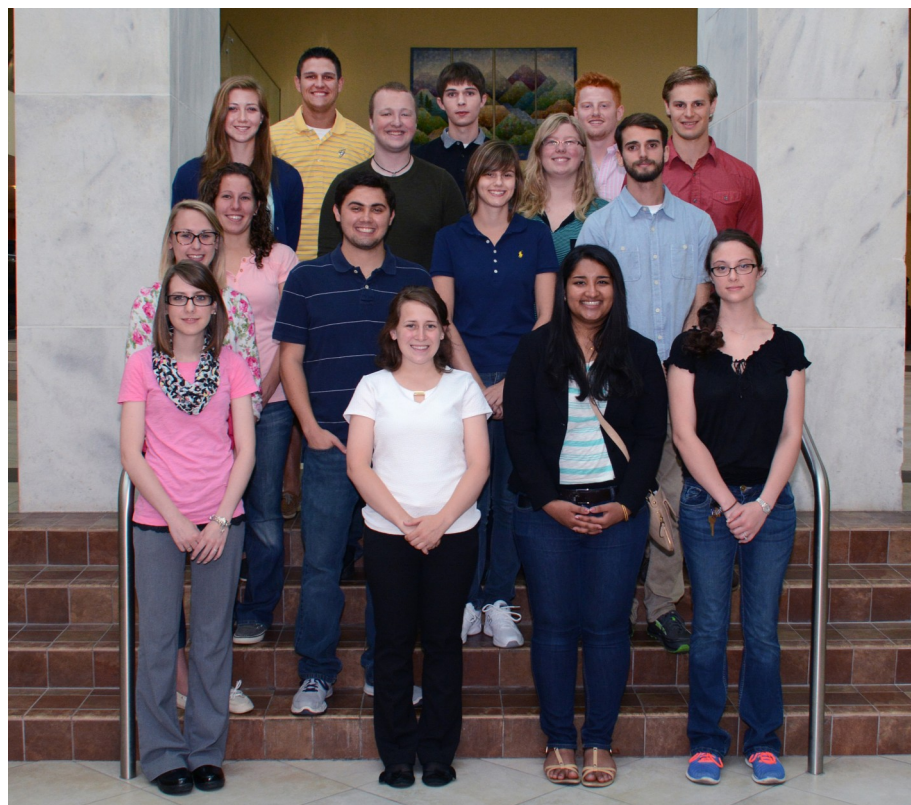


**Student Intern Participants in the 2015
WV-INBRE Biomedical Research Summer Program**

**2015 Student Interns
at Marshall University**

Front Row Left to Right: Ana María Peña, Megann Boone, Ankita Khunt, Natalia Skilioutovskaya-Lopez, Madison Crank

Back Row left to right: Jordan Tate, Alexandria Carter, Seth Deskins, Christiana Hess, Sarah Marshall



**2015 Student Interns
at West Virginia University**

Front Row (Left to Right): Paige Rutter, Catherine Rainey, Shruthi Sreekumar, Danielle Nehilla

Second Row (Left to Right): Leah Figurski, Lore McDaniel, Jonathon Hanson, Caitlin Mulvihill, Ryan Kidwiler

Third Row (Left to Right): Rebekah Honce, Jonathan hardy, Lindsey Bent, Bobby Jesmer

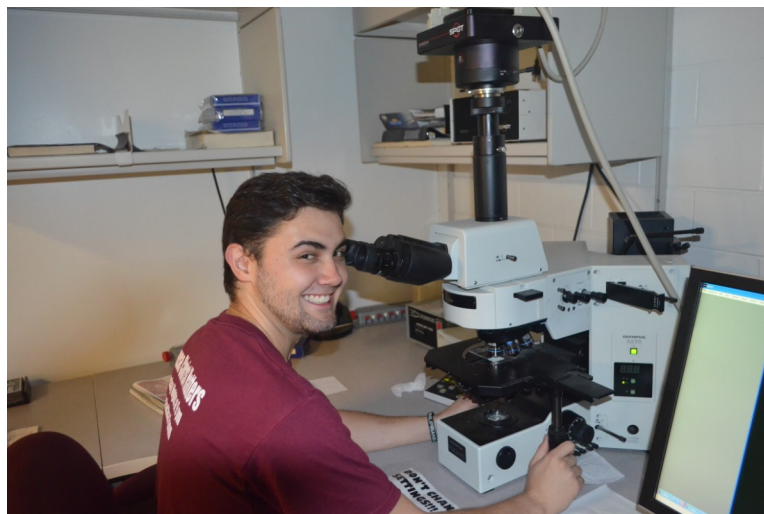
Back Row (Left to Right): Brandon Wisman, Brett Szeligo, Zach Ransom



Student Interns Working In The Labs

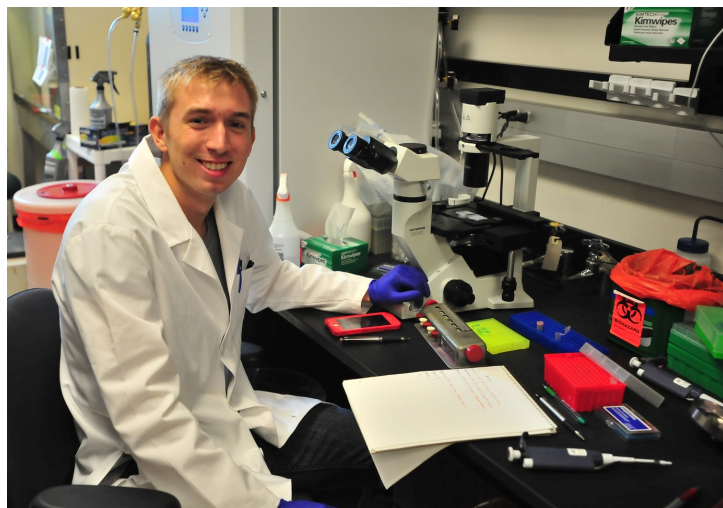


Gary Morris, PhD, a faculty fellow from Glenville State College worked with Dr. Salisbury at Marshall University



Jonathan Hanson, from the University of Charleston, worked in Dr. Wu's lab West Virginia University

Student Interns Working In The Labs (continued)

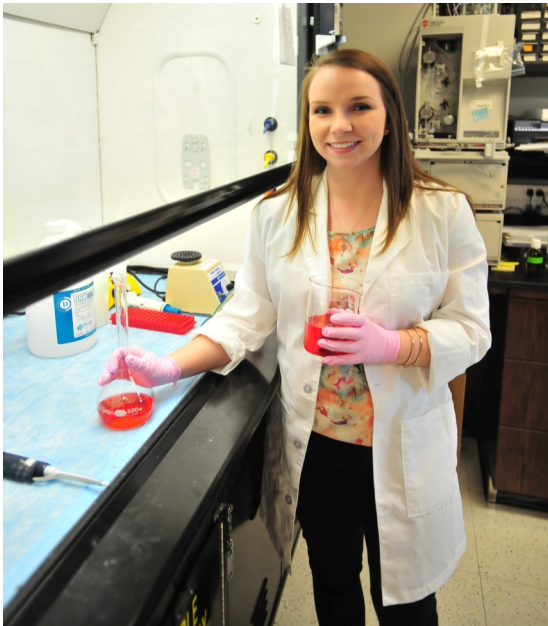


Seth Deskins, from the University of Charleston, worked in Dr. Sollar's lab at Marshall University

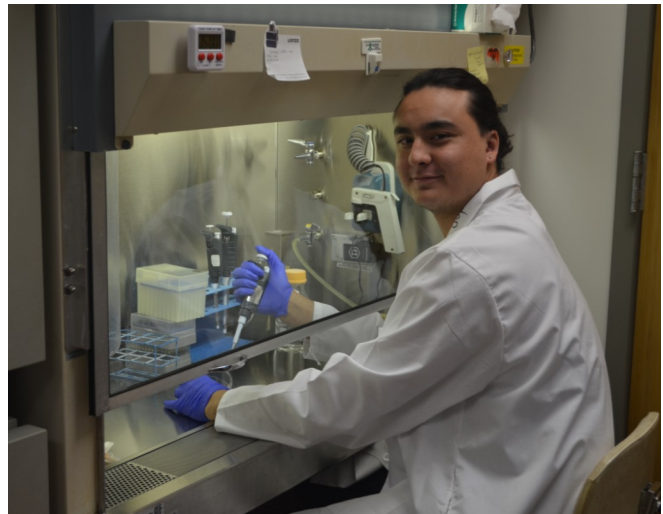


Shruthi Sreekumar, from Shepherd University, worked in Dr. Hollander's lab at West Virginia University

Student Interns Working In The Labs (continued)

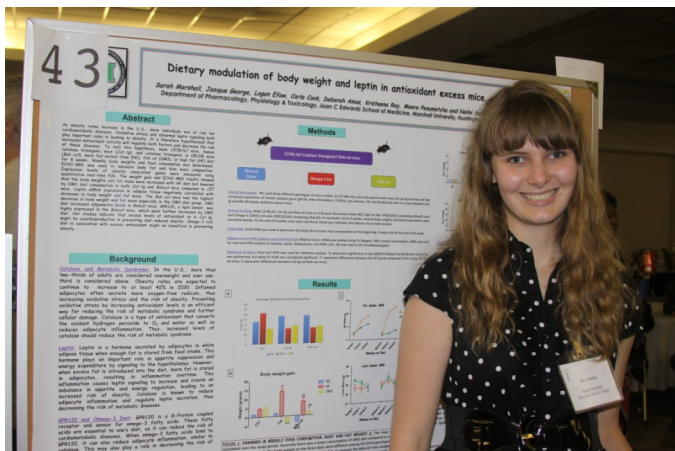


Megan Boone, from West Virginia Wesleyan College, worked in Dr. Valentovic's lab at Marshall University

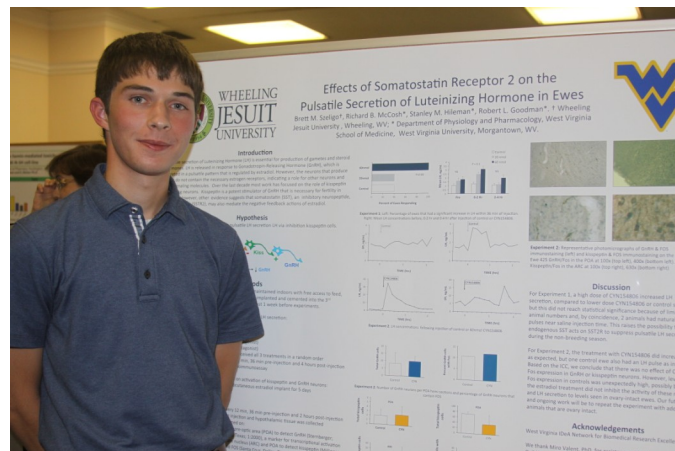


Brandon Trinh, from Bethany College, worked in Dr. Ivanov's lab at West Virginia University

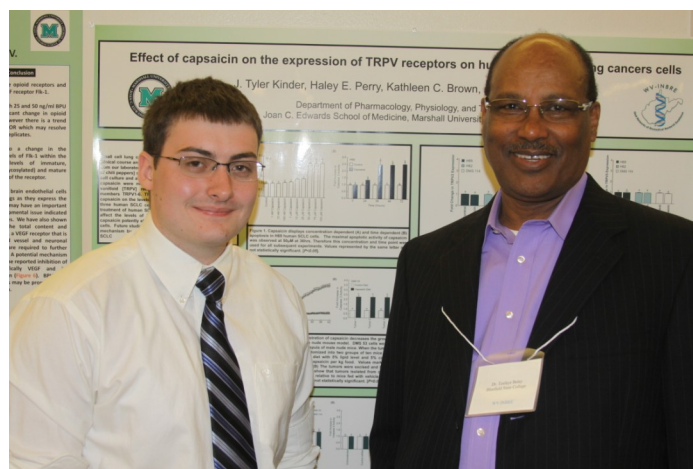
Summer Participants Present Posters at WV-INBRE Symposium



Sarah Marshall, from Davis & Elkins College presented her poster Dietary modulation of body weight and leptin in Antioxidant excess mice”.



Brett Szeligo, from Wheeling Jesuit University, presented his poster “Effects of Somatostatin Receptor 2 on the Pulsatile Secretion of Luteinizing Hormone in Ewes.”



Jonathan Kinder, Bluefield State College, presented his poster “ Effect of capsaicin on the expression of TRPV receptors on human small cell lung cancers cells”. Here he is pictured with Dr. Belay from Bluefield State College. In addition, Jonathan received a Travel Award to present this poster at the Annual Biomedical Research Conference for Minority Students San Antonio, Texas November, 12 2014 until November 15, 2014.

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 2015-2016 academic year, 11 HSTA scholars

were selected to participate in this program as WV-INBRE student interns. Seven student interns are participating at the PUIs, 3 interns at Marshall University, and 1 intern at West Virginia University.

The seven student interns at the PUIs are: Malcolm Lee, working with Dr. Yi Charlie Chen at Alderson-Broaddus University; Maya Patterson and Nikole Smalls, working with Dr. Tesfaye Belay at Bluefield State College; Jillian Mayle, working with Dr. Albert Magro at Fairmont State University; Franklin Lyons, working with Dr. Rebecca Linger at University of Charleston; and Jenna Ingram and Anna Gaughenbaugh, working with Dr.

Joseph Horzempa at West Liberty University.

The three student interns at Marshall University are: Shakira Bowman working with Dr. Monica Valentovic; Amber Bryant working with Dr. Sandrine Pierre; and Mikayla Buchanan working with Dr. Nalini Santanam.

One student intern, Melissa Ashman, is working with Dr. Paul Chantler at West Virginia University.

All student interns will present the results of their research projects at the 15th Annual WV-INBRE Summer Research Symposium in Morgantown WV on July 25, 2016.

WV-INBRE Faculty Research Development Awards for 2015-2016

This year we were able to make five Faculty Research Development Awards to faculty at four different undergraduate institutions. Dr. Rebecca Linger of the University of Charleston received funding for her project "Protein expression and enzymatic analysis of *Burkholderia cenocepacia* Lpe". Dr. Albert Ma-

gro of Fairmont State University was funded for his project entitled "Degradation of complement components by MMPs in apoptotic glioblastoma cells", and Dr. Melanie Sal of West Virginia Wesleyan for her project "Effects of alternative media formulations on growth of *Borrelia burgdorferi*".

Two faculty members from West Liberty University were funded. Dr. Deanna Schmitt for her project "the mechanism of action of resazurin, a novel antibiotic", and Dr. Natalia Omelchenko for her project entitled "Effect of nicotine on neural tube development".

WV-INBRE Travel Awards

WV-INBRE has provided funding for four undergraduates to attend and present the results of their WV-INBRE sponsored research at the 2015 Southeast IDeA Conference, November 11-13, in Biloxi, Mississippi. Three students from West Liberty University were funded. Ms. Rebecca Barnes presented on "The role of the erythrocyte cytoskeleton protein spectrin during

invasion by *Francisella tularensis*.", Mr. Devin Sindeldecker on "The Role of FTL_0129 in the Invasion of Erythrocytes by *Francisella tularensis*", and Ms. Leah Figurski on "Bone marrow-derived mesenchymal stem cells and preadipocytes cultured with breast tumor cells favor cytokine secretion". Ms. Kristin Brown of Bluefield State College presented on her

research entitled "Improved Immune Function and Reduced Chlamydia Genital Infection in a Murine Stress Model Fed with Active Hexose Correlated Compound". This was a wonderful opportunity for undergraduates to attend and participate in a regional scientific conference.

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