



## Dr. Cutler Speaks at WV-INBRE Symposium



Stephen J. Cutler, Ph.D.  
Chair and Professor  
Director NIH COBRE  
CORE-NPN  
Department of Medicinal  
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ing of the role this system plays in the maintenance of good health. Dr. Cutler has spent much of his life in a research laboratory, being introduced to this environment by his father "Hank" Horace Cutler, who was a natural products chemist as well. Dr. Cutler's formal education was at the University

Dr. Cutler is an internationally recognized natural products chemist with expertise in the isolation and structural elucidation of biologically active natural compounds. He presently conducts research on the *Cannabis sativa* (marijuana) plant and other sources of natural products for their effects on the endocannabinoid system. This research has led to a greater understand-

of Georgia where he earned a B.S. in chemistry while working for Richard K. Hill and George F. Majetich. In 1989 he received his Ph.D. degree in medicinal chemistry from the University of Georgia under the direction of Dewitt Blanton, Jr. Dr. Cutler has been recognized for his teaching excellence by pharmacy students 11 times at 3 different academic institutions. In addition, he has been recognized on a national level for his role as an advisor to students' organizations. Dr. Cutler also offers service to his discipline by serving as a reviewer for 15 scientific journals. Additionally, he serves as a reviewer of grants for the National Institutes of Health, the United States Department of Agriculture, the National Aeronautics and Space Administration, the National Science Foundation, and the Department of Defense. During his career, Dr. Cutler has received more than \$20,000,000 from various federal agencies including the NIH, NSF, DoD, CDC, NASA, and the USDA. He is the author or co-author of more than 45 patents (US and international), 90 peer-reviewed publications, 3 books, 25 published abstracts, and 48 invited presentations. Dr. Cutler has served on the organizing committees of 20 national and international scientific meetings. Presently, Dr. Cutler serves as the Chair and Professor of the Department of Medicinal Chemistry at the University of Mississippi School of Pharmacy. He also serves as the Editor-in-Chief for the scientific journal *Medicinal Chemistry Research*. Past members of Dr. Cutler's research group are employed in various pharmaceutical companies, the NIH, the CDC, the FDA, and the USDA.

Dr. Cutler's research is entitled "Use of Natural Products from Marijuana in the Discovery of Novel Medicines"



### 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  
Glenville 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. -

As I look across the Marshall University campus, I see the leaves falling from the trees, and snow has already made a big appearance in West Virginia. Winter is clearly on its way, signaling the change from Fall to a new season. Change has also come to WV-INBRE as the IDeA program (INBREs and COBREs) has transitioned from the National Center for Research Resources (NCRR) to the National Institute for General Medical Sciences (NIGMS). As you may recall from last Fall's newsletter, National Institutes of Health (NIH) Director Dr. Francis Collins has worked to create the National Center for Advancing Translational Sciences (NCATS), which became a reality when the 2011-2012 budget was signed into law by President Obama. NCATS was formed through moving several clinical and translational related programs from other NIH centers and institutes into the newly formed center. The transfer of the Clinical and Translational Science Award (CTSA) program from NCRR into NCATS markedly reduced the NCRR budget, led to the dissolution of NCRR and the movement of the remaining NCRR programs to other centers and institutes. After much discussion, the IDeA program was finally moved to NIGMS.

What does the movement of the IDeA program from NCRR to NIGMS mean for WV-INBRE? The budget for the IDeA program and some key personnel from NCRR that worked with the IDeA program have been moved to NIGMS. Dr. Fred Taylor who was the IDeA Program Director at NCRR is now the IDeA Program Director at NIGMS. However, we will no longer be working with Dr. Krishan Arora as our Program Official or Ms. Ruthann Rand as our Grants Management Specialist, since we have a new Program Official (Dr. Regine Douthard) and Grants Management Specialist (Ms. Claudette Grubelich).

Dr. Arora moved to NIMHD and Ms. Rand moved to NCATS, and we wish them well in their new roles within NIH. In addition to changes in NIH personnel, our grant number changed from 5P20RR016477 (last year) to a new grant number (8P20GM103434-12) starting May 1, 2012. With a new grant number, NIGMS has asked that starting May 1, 2012, authors cite both the NCRR and NIGMS grant numbers on their published abstracts, peer-reviewed manuscripts, etc. for one more year.

In November 2011, we received eight grant applications for major PUI research awards. These applications were each reviewed by two non-WV-INBRE reviewers, and the reviews and scores were submitted to the External Advisory Committee for funding recommendations. Recommendations were reviewed by the Administrative Core, and three proposals were selected for a two-year funding period. The three projects selected for funding were: The Mechanism of Erythrocyte Invasion by *Francisella tularensis*, Dr. Joseph Horzempa, West Liberty University; Modeling and Stability Analysis of Mixed Immunochemotherapy of Tumors by Impulsive Control, Dr. Qing Wang, Shepherd University; and PI3K, AKT and cMyc Pathways in Chaetoglobosin-inhibiting Tumorigenesis, Dr. Yi Chen, Alderson-Broaddus College. These new projects began on May 1, 2012 with the start of our Y12 funding.

We also had a wonderful summer research program again this year. Twenty-seven undergraduate students and two faculty members from the partner institutions conducted biomedical research at Marshall University and West Virginia University. We also had two students from other Southeast Region INBREs (one from Louisiana and one from Kentucky) conduct summer research at Marshall University as part of a new experimental exchange pro-

gram in bio-informatics research.

This program will again occur in 2013. The summer research symposium was held on Monday,

July 30, 2012 at West Virginia University and was well attended. Dr. Stephen Cutler from the University of Mississippi, a member of our External Advisory Committee was our keynote speaker and gave an inspiring presentation about marijuana and the development of novel drugs.

Lastly, I want to remind everyone that the WV-INBRE award will be coming up for renewal in the near future. It is imperative that we continue to increase the evidence of our research efforts. That means, investigators supported by funds from WV-INBRE need to be presenting and publishing their research results as often as possible and turning their results into grant applications. One of the main criteria that reviewers will consider in scoring our renewal application is our productivity. So, it is essential that we have as many publications, etc. as possible citing the WV-INBRE award (5P20RR016477 & 8P20GM103434). This includes research that involves the use of equipment that WV-INBRE has funded at all the network schools. Please be sure to have your colleagues acknowledge support from the WV-INBRE grant if they are using equipment purchased in part or wholly with WV-INBRE funds. Let's show NIH that the West Virginia-INBRE research network is doing great work!

I hope that you all have a wonderful holiday season and a Happy New Year!



## 11th Annual WV-INBRE Summer Symposium

On July 30, 2012, West Virginia University hosted the 11<sup>th</sup> Annual WV-INBRE Summer Symposium. Professors and students from eleven different West Virginia colleges and universities gathered to present the results of their research and listen to the keynote presentation by Dr. Stephen Cutler from the University of Mississippi School of Pharmacy. During the 2012 Summer Program, WV-INBRE supported twenty-two Interns, two Faculty Fellows, two Bioinformatics Interns, and four high school teachers from the West Virginia HSTA program. Fifteen Interns and one Faculty Fellow carried out their research at WVU, (Table 1.). Eleven Interns, two Bioinformatics Interns, and one Faculty Fellow were located at Marshall University (Table 2.). The Four high school teachers and their mentors are shown in Table 3.

Opening remarks were given by Dr. Glen Dillon, Vice-President for Research, West Virginia University Health Sciences Center and Dr. Gary Rankin of Marshall University, the WV-INBRE Principal Investigator. Research presentations were given by Faculty Fellow Jennifer Franko, High School Teacher Wendy Lee, and four Interns, two each from Marshall and WVU. The keynote address by Dr. Stephen Cutler entitled “Use of Natural Products from Marijuana in the Discovery of Novel Medicines” combined good science with humor. Following lunch a total of fifty-eight research posters were presented by students, faculty and teachers from all the participating institutions.

**Table 1. Interns, Faculty Fellow, and Research Mentors at West Virginia University**

<u>WV-INBRE Summer Intern – Home Institution</u>	<u>Mentor</u>
Anna Alappatt –Shepherd Univ.	Dr. Alexey Ivanov
Laura Bradel –Shepherd Univ.	Dr. John Thomas
Vera Filatova –Wheeling Jesuit Univ.	Dr. Julie Brefczynski
Sarah Fyock –Davis and ElkinsCollege	Dr. Hunter Zhang
Joseph Greschner –Bethany College	Dr. Lisa Salati
Chelsea Gundersen -WV Wesleyan College	Dr. Stan Hileman
Rebecca Haley –Wheeling Jesuit University	Dr. Rajesh Naz
Joseph Hansroth –Shepherd University	Dr. Sharon Wenger
Kimberley Harding –Bluefield StateCollege	Dr. Han-Gang Yu
Dillon Huffman –WV Wesleyan College	Dr. Yon Rojanasakul
Mariah Kemmerer –Bethany College	Dr. Joan Olson
Susan Kurian –Shepherd University	Dr. Richard Dey
Zachery Lonergan –WV Wesleyan College	Dr. Laura Gibson
Brittany Marsh –Bethany College	Dr. Patrick Callery
Kayla Sisson –Fairmont State University	Dr. Stephen Always

Faculty Fellow

Dr. Jennifer Franko – Bethany College

Dr. Rosana Schafer

## 11th Annual WV-INBRE Summer Symposium (continued)

**Table 2. Interns, Faculty Fellow, and Research Mentors at Marshall University**

<u>WV-INBRE Summer Intern – Home Institution</u>	<u>Mentor</u>
Benjamin Kordusky – WV Wesleyan College	Dr. Elaine Hardman
Jackie Fletcher – West Virginia State University	Dr. Travis Salisbury
Leah Starkey – West Liberty University	Dr. Richard Egleton
Bradley Schell – West Virginia State University	Dr. Philippe Georgel
Andre Lamyathong – Wheeling Jesuit University	Dr. Monica Valentovic
Mardochee Isme – Bluefield State College	Dr. Nalini Santanam
Samie Sabet – University of Charleston	Dr. Gary Rankin
Rebecca Creel – Concord University	Dr. Piyali Dasgupta
Jacob Fisher – Bethany College	Dr. Eric Blough
Randi Dillon – University of Charleston	Dr. Beverly Delidow
Elizabeth Smith – Concord University	Dr. Hongwei Yu

Faculty Fellow

Dr. Gary Morris – Glenville State University	Dr. Travis Salisbury
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Southeast Region Bioinformatics Interns

Alonna Ballinger – Western Kentucky University	Dr. Pilippe Georgel
	Dr. Jim Denvir
Casie James – Tulane University	Dr Travis Salisbury
	Dr. Jim Denvir

**Table 3. HSTA Teachers and Research Mentors**

<u>High School Teacher</u>	<u>Mentor</u>
Julie Blaylock – South Charleston High	Dr. Gerald Hankins – WV State Univ.
Olivia Boskovic – Huntington High	Dr. Emine Koc – Marshall Univ.
Wendy Lee – Musselman High	Dr. Joan Olson – West Virginia Univ.
Myriaha Selbe-Felker – Cabell Midland High	Dr. Nalini Santanam – Marshall Univ.

### Publications By Former Interns

Zondlo SC, **Lee AE**, Zondlo NJ. Liu Z, Lederman D, Locuson CW, **Thomsen NM**, Vongsutilers V, Determinants of specificity of Ayscue RR, **Thomsen NM**, Tracy Gannett P. The synthesis of c8-aryl purines, nucleosides and phosphoramides. Crit. Rev. Eukaryot. Gene Expr. 21: 155-176, 2011.

Biochemistry, 45: 11945-11957, J. Am. Chem. Soc. 128: 8374-8375, 2006.

Meng HY, Thomas KM, **Lee AE**, Vongsutilers V, Phillips DJ, Train Zondlo NJ. Effects of I and i+3 residue identity on the cis-trans isomerism of the aromatic(i+1)-prolyl(i+2) amide bond: implications for type VI beta-turn formation. Biopolymers, 84: 192-204, 2006.

BC, McKelvey GR, **Thomsen NM**, Shaughnessy KH, Lewis JP, Gannett PM. The conformational effect of para-substituted C8-arylguanine adducts on the B/Z-DNA equilibrium. Biophys. Chem. 154: 41-48, 2011

Franchino HA, Johnson BC, Neeley SK, **Tajhya RB**, Vu MP, Wilson-Ashworth HA, Bell JD. Combined use of steady-state fluorescence emission and anisotropy of merocyanine 540 to distinguish crystalline, gel, ripple, and liquid crystalline phases in dipalmitoylphosphatidylcholine bilayers. PMC Biophys. 3: 14, 2010

Gannett PM, Kabulski J, Perez FA,



## Interns Selected for 2012 Summer Research Program



WV-INBRE Summer Students at Marshall University (L-R): Front Row-Rebecca Creel, Andre Lamyathong, Ben Kordusky, Elizabeth Smith, Leah Starkey, Mardochee Isme; Back Row-Randi Dillon, Samie Sabet, Brad Schell, Jacob Fischer, Jackie Fletcher

Twenty-six undergraduate student interns were selected to participate in the 2012 WV-INBRE Summer Research Program at West Virginia University and Marshall University. Eleven interns were located at Marshall University and fifteen conducted their internship at West Virginia University. There were fifty-three applications received and reviewed in order to fill the twenty six positions. Interns come from thirteen of the fourteen Primarily Undergraduate Institutions in the WV-INBRE network. In addition, two interns from the new Bioinformatics Internships for Undergraduate Students in the southeast INBRE Region also participated in the summer program at Marshall University.



WV-INBRE Summer Students At West Virginia University (L-R): First Row-Joseph Greschner, Mariah Kemmerer, Rebecca Haley, Vera Filatova; Second Row-Brittany Marsh, Susan Kurian, Kayla Sisson, Laura Bradel, Anna Alappatt; Third Row-Chelsea Gunderson, Dillon Huffman, Sara Fyock, Kimberly Harding; Top Row-Zachery Lonergan, Joseph Hansroth

## Former Summer Interns are Pursuing Graduate Degrees and Conducting Post-Graduate Research

Former interns of the WV-BRIN and WV-INBRE summer research programs are enrolled in Ph.D. biomedical graduate programs around the country (home institution and year(s) in summer program).

**Don Bertolotti** (West Virginia State University - 2008, 2009); Marshall University School of Medicine Graduate Program in Biomedical Sciences

**Gina Cottrill** (Glenville State College - 2006, 2007); Baylor Medical College, Program in Molecular and Cell Biology

**Matthew Glover** (Shepherd University - 2010); University of Alabama at Birmingham, Graduate Program in Neuroscience

**Surnam Gurung** (Davis and Elkins College - 2006); University of Oklahoma Health Sciences Center, Department of Cell Biology

**Christopher Hearn** (West Liberty University - 2009); Marshall University School of Medicine Graduate Program in Biomedical Sciences

**Kelly Koral** (Wheeling Jesuit University - 2007); University of Pittsburgh, Program in Cellular and Molecular Pathology

**Aaron Lee** (Shepherd University - 2003); University of Delaware, Department of Biochemistry

**Frank Lutz** (West Virginia State University-2010); Marshall University School of Medicine Graduate Program in Biomedical Sciences

**Cody Nichols** (West Virginia Wesleyan - 2008, 2009); West Virginia University Health Sciences Center, Graduate Program in Biomedical Sciences

**Jonathan Proto** (Wheeling Jesuit University - 2006, 2007) University of Pittsburgh, Program in Cellular and Molecular Pathology

**Chris Racine** (Davis & Elkins College - 2007); Marshall University School of Medicine Graduate Program in Biomedical Sciences

**Kelly Reneau** (Bethany College - 2007); University of Cincinnati, Program in Molecular Genetics, Biochemistry and Microbiology

**Jennifer Sisler** (Davis & Elkins College - 2006); Virginia Commonwealth University, Department of Biochemistry and Molecular Biology

**Jeremy Smith** (Salem International University - 2002, 2003, West Virginia State University - 2005); Mississippi State University, Department of Biochemistry and Molecular Biology

**Rajeev Tajhya** (Salem International University -2006); Baylor Medical College, Department of Molecular Physiology and Biophysics

**Alison Teter** (West Virginia Wesleyan College - 2007, 2008); Marshall University School of Medicine Graduate Program in Biomedical Sciences

**Nissa Thomsen** (Shepherd University - 2004) is enrolled in the M.D./Ph.D. program at the West Virginia University School of Medicine.

**Dr. Natasha Pillay Smiley** (Salem International University) was in the first WV-BRIN summer intern class in 2002. Following completion of medical school and a pediatric residency, Natasha was accepted into a pediatric hematology/oncology fellowship at Nationwide Children's Hospital in Columbus, Ohio. As a member of the hospital's T32 training grant, program she was awarded a prestigious Hyundai Hope on Wheels Scholar grant to study pathways involved in the proliferation of osteosarcoma cells. Since its inception, the Hyundai Hope on Wheels Cancer Program has donated more than \$23 million to children's hospitals across the country to help kids fight cancer. Former interns of the WV-BRIN and WV-INBRE summer research programs are enrolled in Ph.D. biomedical graduate programs around the country (home institution and year(s) in summer program).



Dr. Natasha Pillay Smiley

## Summer Participants Working In The Labs



Sami Sabet, University of Charleston, worked in Gary Rankin's lab at Marshall University



Anna Alappatt, Shepherd University, worked in Alexey Ivanov's lab at West Virginia University



Elizabeth Smith, Concord University, worked in Hongwei Yu's lab at Marshall University



Zachery Lonergan, a student from West Virginia Wesleyan College, worked in Laura Gibson's lab at West Virginia University.



## Students Working In The Labs (continued)



Randi Dillon, University of Charleston, worked in Beverly Delidow's lab at Marshall University



Kimberly Harding, a student from Bluefield State College worked in Han-Ghang's lab at West Virginia University.



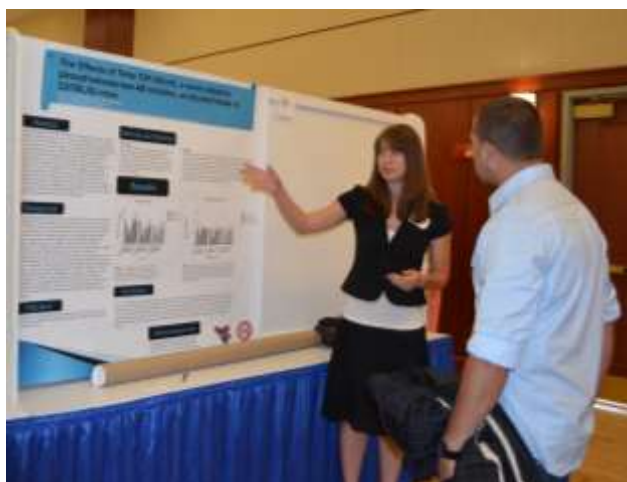
Joseph Greschner, Bethany College, worked in Lisa Salati's lab at West Virginia University.



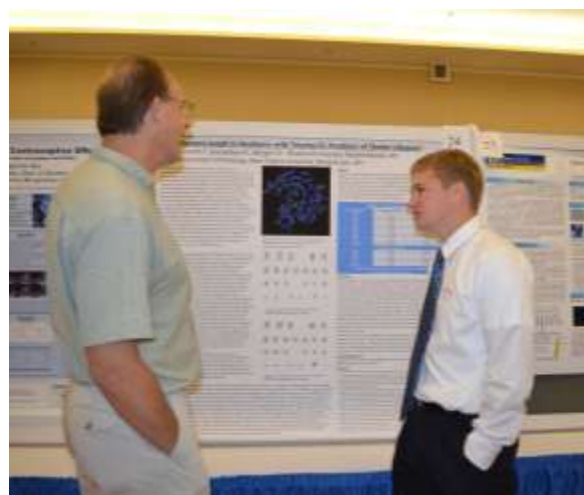
Andre Lamyathong, Wheeling Jesuit University, worked in Monica Valentovic's lab at Marshall University.



## Summer Students Present Posters at WV-INBRE Symposium



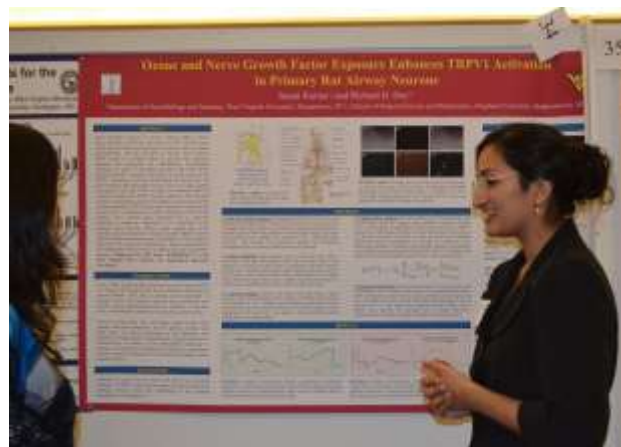
Sara Fyock, Davis and Elkins College presented her poster "The Effects of Tetra TDP-003-02, a novel selective phosphodiesterase-4B inhibitor, on Alcohol Intake in C57BL/6J mice."



Joseph Hansroth, Shepherd University presented his poster "Telomere Length in Newborns with Trisomy 21: Predictor of Shorter Lifespan?"

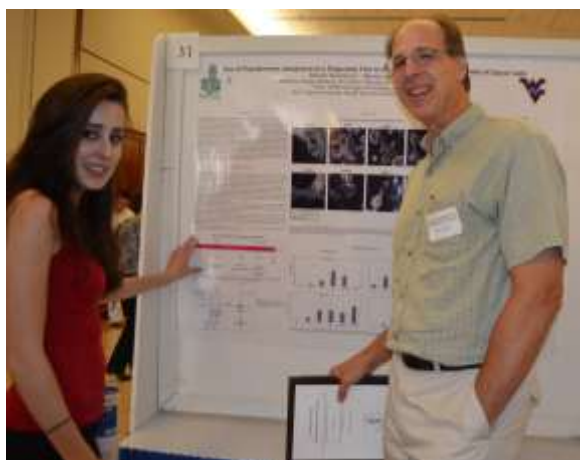


Joseph Greschner, Bethany College, explains his poster "Characterizing the hnRNP K binding site in G6PD RNA" to another WV-INBRE student and fellow Bethany College classmate, Brittany Marsh.

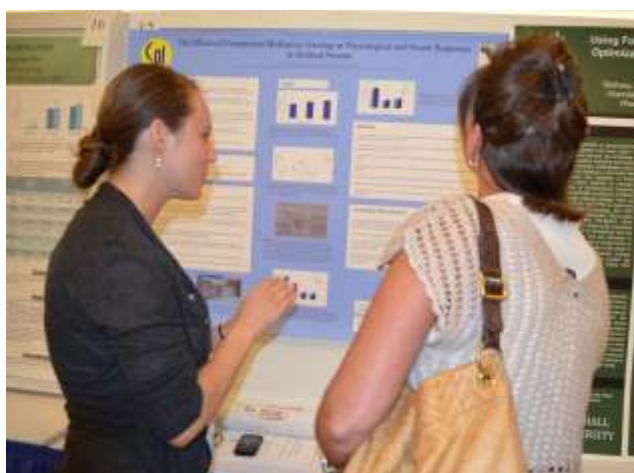


Susan Kurian, Shepherd University, presented her poster "Ozone and Nerve Growth Factor Exposure Enhances TRPV1 Activation in Primary Rat Airway Neurons."

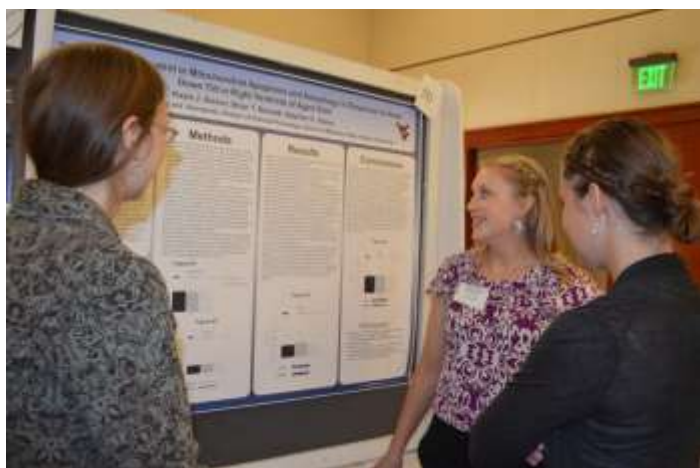
## Students Present Posters at WV-INBRE Symposium (continued)



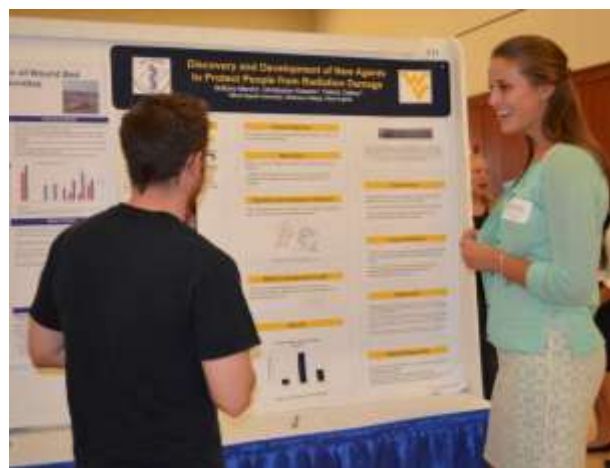
Mariah Kemmerer, Bethany College, stands with Andrew Shiemke, PhD from West Virginia University. The title of her project was “Use of *Pseudomonas aeruginosa* as a Diagnostic Tool to Determine the Metastatic Potential of Cancer Cells.”



Vera Filatova, Wheeling Jesuit University, presented her poster “The Effects of Compassion Meditation Training on Physiological and Neural Responses to Disliked Persons.”



Kayla Sisson, Fairmont State University, presented her poster “The Role of Resveratrol in Mitochondrial Apoptosis and Autophagy in Response to Head-down tilt in Aged Rats.”



Brittany Marsh, Bethany College, presents her poster “Discovery and Development of New Agents to Protect People from Radiation Damage.”

## High School Science Educators Participate in WV-INBRE Summer Program

The partnership between WV-INBRE and the Health Science Technology Academy (HSTA) program is focused



Wendy Lee, a high school science educator from Musselman High School in Hedgesville, WV spent her internship working in Joan Olson's lab at West Virginia University.

on encouraging undergraduate students, who have demonstrated an interest in biomedical research through

their participation in the HSTA program while in high school, to continue to develop this interest in biomedical research once they enroll in one of the PUIs.

One unique component of this joint program is to provide opportunities for high school science educators to participate in biomedical research for up to nine weeks during the summer with a mentor at either West Virginia University, Marshall University, or one of the WV-INBRE-funded PUI laboratories.

Participation is open to high school science educators who have taught in the state of West Virginia during the previous academic school year. The goal of this part of the program is to provide research opportunities to interested science teachers with the expectation they will take their research experience back into their classrooms and inspire their students to pursue biomedical research opportunities once they enter college.

Additionally, it is anticipated that the techniques they learn from the research will enhance the scientific teaching experience in the classroom.



Olivia Boskovic, a high school educator from Huntington High School of Proctorville, Ohio spent her internship working with Emine Koc at Marshall University.

### Announcement

WV-INBRE is pleased to announce the availability of Summer Research Fellowships in biomedical research for students and faculty at the partner institutions in the WV-INBRE network. The 2013 Summer Research Program will run from May 28 till July 25, 2013 with the Summer Research Symposium to be held on July 25 at Marshall University. A stipend is paid to the participant for the 9-week research experience. As in the past, positions are available at WVU Health Sciences Center and Marshall University. Application deadline is November 16, 2012. The online application and additional information can be found at: <http://www.wv-inbre.net/>.



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