



West Virginia State University's Hankins Named Newest WV-INBRE Project Investigator

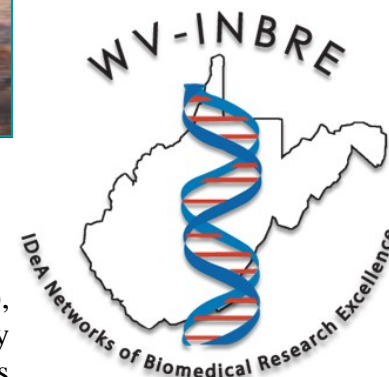


Dr. Gerry Hankins, West Virginia State University, WV-INBRE Project Investigator, funded for study on "Sex Steroid Hormones and Epigenetics in Meningiomas".

the newest project investigator (PI) following a highly competitive selection process. Dr. Hankins project, entitled "Sex Steroid Hormones and Epigenetics in Meningiomas", selected for funding over the next four years for \$690,304 (total costs), is one of only nine currently active major WV-INBRE network awards. Current members of Dr. Hankins research team

Dr. Gerald Hankins, Assistant Professor of Biology at West Virginia State University include: Grace Nyiiro (undergraduate), Sumanth Manohar (MS student), Shelly Bright (MS student), Laura Matthews (MS student), Katrina Fernandez (undergraduate), William Rollyson (undergraduate), Gerald Hankins, Velvet Worstell, M.S. (lab tech/manager)

Dr. Hankins trained originally as a statistician and spent the first decade of his career in statistics before going back to school to earn his Ph.D. at the University of Virginia where he identified a Drosophila tumor suppressor gene. As a post-doctoral research associate at Duke University he helped establish that the imprinted gene, the mannose-6-phosphate/insulin-like growth factor 2 receptor functions as a tumor suppressor. Dr. Hankins returned to the University of Virginia as an Assistant Professor of Research in Neurosurgery where he worked on the development of gene therapy strategies (see *Hankins* - p. 11)



Institutions of the WV-INBRE

Lead Universities

Marshall University
West Virginia University

Partner Institutions

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

Inside this issue:

| | |
|--------------------------------------|-----|
| Dr. Hankins-New Project Investigator | 1 |
| Message from PI | 2 |
| NISBRE Meeting | 3 |
| Dr. Ken Tew-Symposium Speaker | 3 |
| Symposium Poster Presentations | 4-6 |
| Students Working in Labs | 7-8 |
| HSTA Graduates and INBRE | 9 |
| High School Educators and INBRE | 10 |



Research team of Hankins laboratory at West Virginia State University. From left: Grace Nyiiro, Sumanth Manohar, Shelly Bright, Laura Matthews, Katrina Fernandez, William Rollyson, Gerald Hankins, Velvet Worstell, M.S.

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

There is always something new in WV-INBRE. This year has been no exception with new projects, programs and personnel. First, I am pleased to announce Dr. Gerald Hankins from the Department of Biology at West Virginia State University as the newest Project Investigator for a major WV-INBRE partner institution research award. His project is entitled "Sex steroid hormones and epigenetics in meningiomas" and was funded beginning on May 1, 2010. Dr. Hankins' application was the only major research award funded following last year's competition. He joins Dr. Charlie Chen (Alderson-Broadus College), Dr. Robert Harris (West Virginia State University), Dr. Robert Shurina (Wheeling Jesuit University) and Drs. Jarrett Aguilar and Robert Kreisberg (West Liberty University as the current major Project Investigators.

A full description of Dr. Hankins' project is included elsewhere in this newsletter. I also want to mention that there will be a competition again this year for major partner institution research awards and up to two additional projects will be funded. Network investigators were notified at the end of March about the competition and provided directions on how to apply. Completed applications are due in our office at Marshall University by November 30, 2010.

We are also pleased to announce that Dr. Stephen J. Cutler, Professor and Chair of the Department of Medicinal Chemistry at the University of Mississippi has joined the External Advisory Committee

for WV-INBRE. Dr. Cutler has expertise in natural product chemistry and drug development and will be a real asset to network members who are interested in identifying potential therapeutic agents from natural product sources. Dr. Cutler attended our Steering Committee meeting and Summer Research Symposium in July and provided numerous helpful suggestions to network investigators. He is also the Principal Investigator of a COBRE award to the University of Mississippi. COBRE, like the INBRE program, is a National Center of Research Resources sponsored program, with COBRE's being directed to establish centers of excellence in biomedical research at research intensive institutions. Thus, Dr. Cutler brings many areas of expertise and experience to help WV-INBRE.

We also had another very successful Summer Research program in 2010. Aided by administrative supplements to our main award from NIH, we were able to provide funding for thirty-six undergraduate students at Marshall University and West Virginia University and sixteen undergraduate students at partner institutions to be part of on the nine-week research experience. In addition, we were able to include one partner institution faculty fellow, one middle school science teacher and six high school science teachers to be part of the summer research program. The culmination of the summer research activities is the Summer Research Symposium which was held at West Virginia University this year. As in the past,



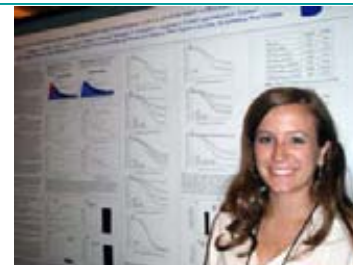
we had oral and poster presentations, but this year we set a symposium record with 78 poster presentations! Our Keynote Speaker this year was Dr. Kenneth Tew, Professor and Chair of the Department of Cell & Molecular Pharmacology and Experimental Therapeutics, Medical University of South Carolina. Dr. Tew is also a member and Chair of the WV-INBRE External Advisory Committee. His presentation was about drug discovery and career opportunities for our students and was both informative and amusing. Additional information about the summer symposium can be found in this newsletter issue. Lastly, I want mention that the link that WV-INBRE has made to the Health Sciences and Technology Academy (HSTA) program is receiving national attention. The HSTA program, also funded by the National Center for Research Resources, is headed by Dr. Ann Chester at West Virginia University and is aimed at disadvantaged high school students; introducing them to biomedical research opportunities through local high school clubs (see *Rankin*—p. 11)

WV-INBRE at National IDeA Symposium for Biomedical Research Excellence

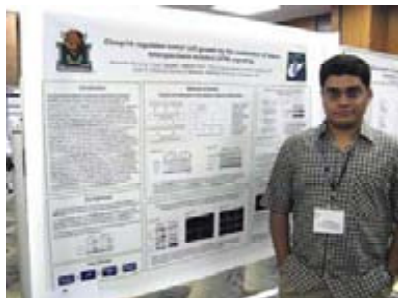


Darrell Crick, Ph.D.
Concord University

The Third Biennial National IDeA Symposium of Biomedical Research Excellence (NISBRE) meeting was held at the Bethesda North Marriott Hotel and Conference Center on June 16-18, 2010. Posters were presented by WV-INBRE faculty and/or students from Alderson-Broaddus College, Concord University, Marshall University, University of Charleston, West Virginia State University, West Virginia University, West Virginia Wesleyan College, and Wheeling Jesuit University.

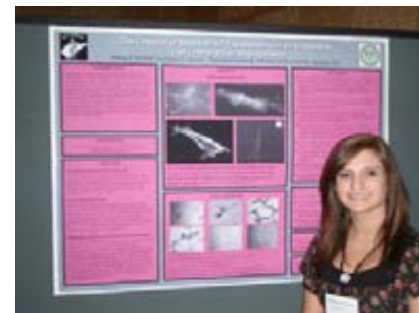


Jordan Beckett
West Virginia Wesleyan College



Sumanth Manohar
West Virginia State University

Several WV-INBRE posters appeared in Highlighted Sessions: Cancer (Brittany Burkhart, WJU and Sumanth Manohar, WVSU), Cardiovascular Biology and Disease (Jordan Beckett, WVWC), and General Medical Science (Darrell Crick, CU). Dr. Rankin (PI of WV-INBRE) chaired the Environmental Sciences & Public Health scientific session.



Brittany Burkhart
Wheeling Jesuit University

WV-INBRE Summer Research Symposium Features Kenneth Tew, Ph.D. as Keynote Speaker

The Ninth Annual WV-INBRE Summer Research was held at the Robert C. Byrd Health Sciences Center of West Virginia University,

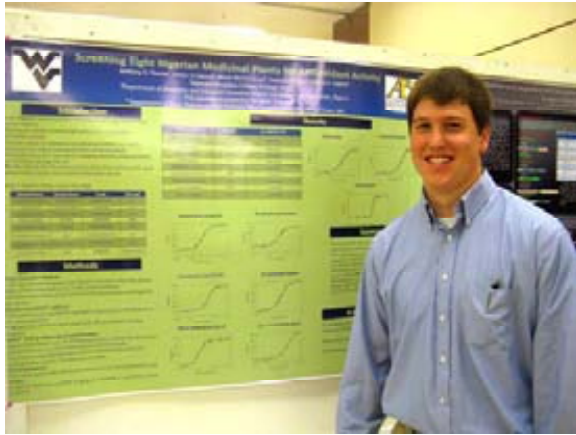


Thursday, July 29, 2010. The morning session of the program began with oral presentations by four student interns, a project investigator and a high school teacher supported by the WV-INBRE/HSTA initiative. Following a luncheon, a poster session was held where eighty presentations were made by summer interns and a fellow who conducted research at WVU, Marshall University, and West Virginia State University during the 9-week summer research program as well as faculty and students conducting research at their home institutions. The keynote speaker was Dr. Kenneth Tew, the John C. West Chair of Cancer Research, Department of Cell & Molecular Pharmacology and Experimental Therapeutics, Hollings Cancer Center, Medical

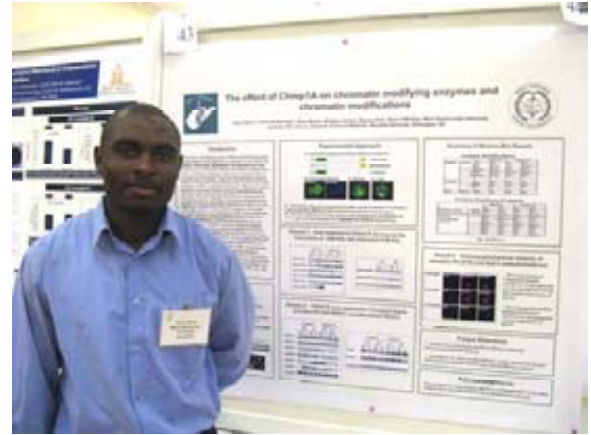
University of South Carolina. Dr. Tew's presentation, "**Cancer Drug Discovery and Development: Academics, Biotechnology or Industry**", described the processes by which drug discovery and development occur and the steps required for drug approval. He stated that the future of drug discovery will involve systems biology and the need to "think outside the box".

Dr. Tew provided a personal perspective in discussing his work on cancer drug discovery in an academic setting, based on utilizing glutathione and glutathione-S-transferase pathways. Various career pathways in drug discovery and development in academics, biotechnology and industry and the contributions that can be made in each were illustrated.

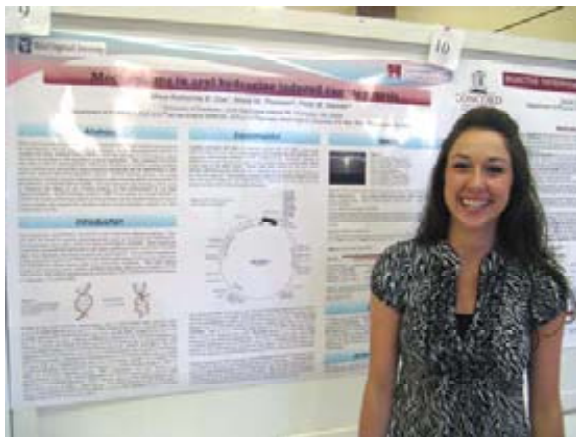
9th Annual WV-INBRE Symposium Poster Presentations



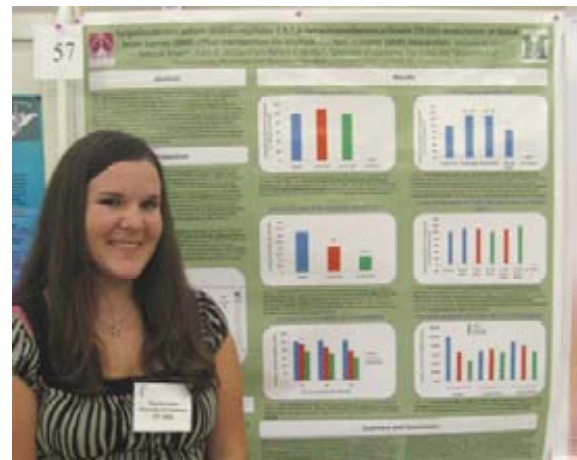
Anthony Thorpe - Alderson-Broaddus College



Grace Nyiiró - West Virginia State University

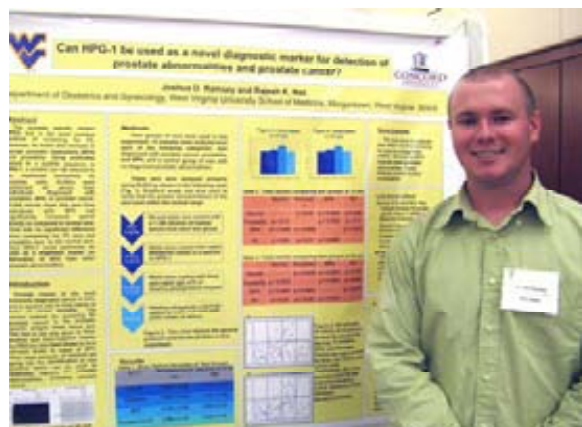


Katie Cox - University of Charleston

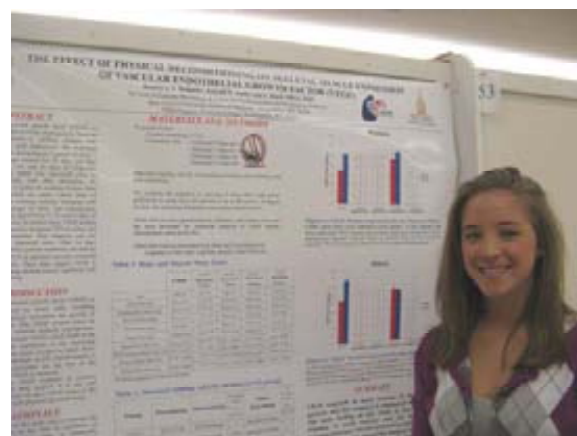


Kayanna Sayre - University of Charleston

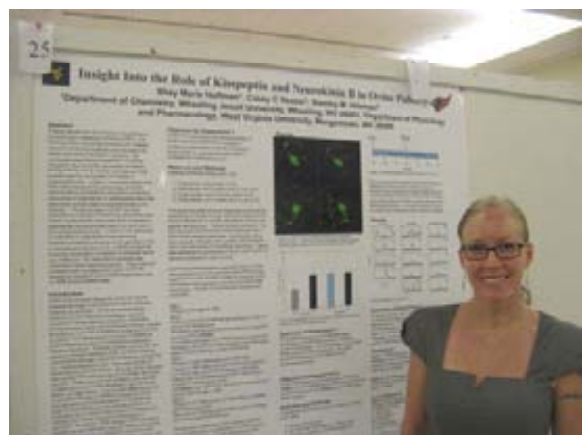
WV-INBRE Symposium Poster Presentations (continued)



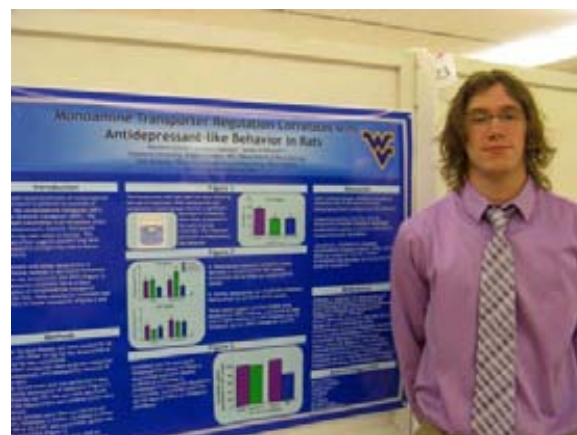
Joshua Ramsey - Concord University



Kathleen Roberts - West Virginia Wesleyan College

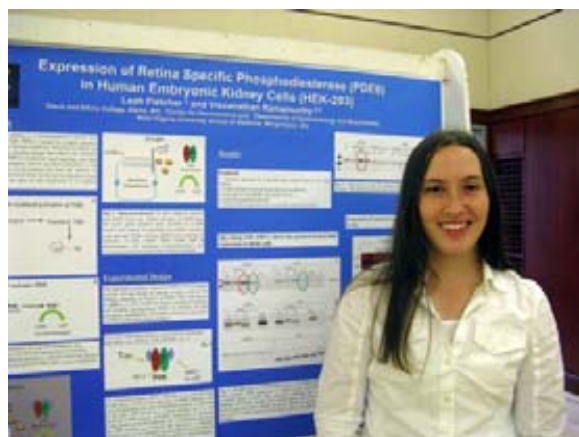


Shay Hoffman - Wheeling Jesuit University

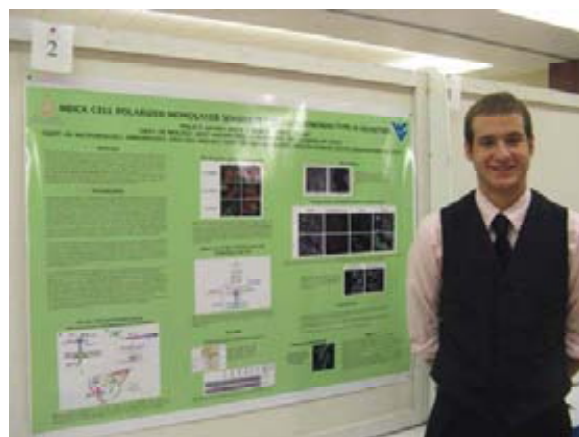


Matt Glover - Shepherd University

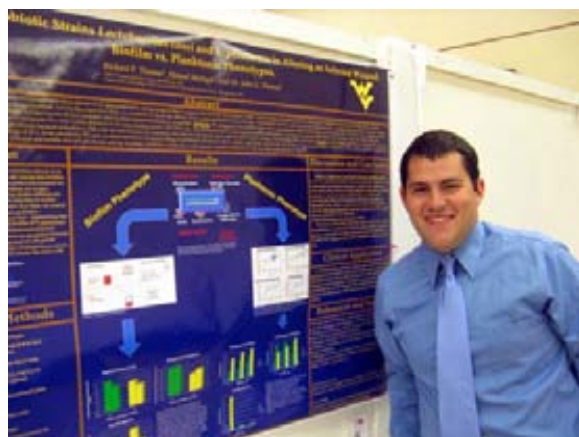
WV-INBRE Symposium Poster Presentations (continued)



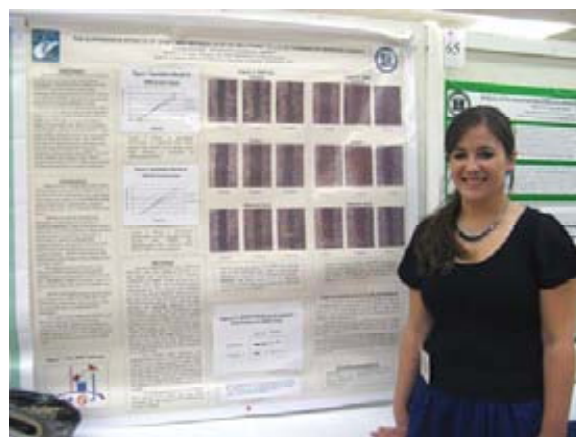
Leah Fletcher - Davis and Elkins College



Phil Adams - West Virginia Wesleyan



Phil Thomas - West Virginia Wesleyan College



Lindsay Sobotka - Bethany College

WV-INBRE Summer Students Working In Labs



Rahul Nagmal - West Virginia State University



Chris Ennis - Bluefield State College



Afton Wickline - Concord University

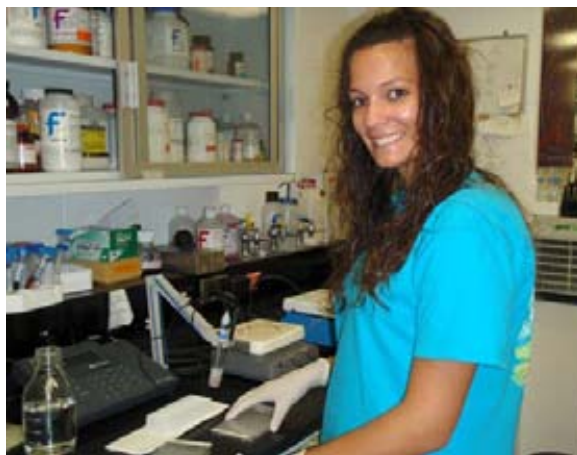


Hope Lima - West Virginia Wesleyan College



Kendra Smith - University of Charleston

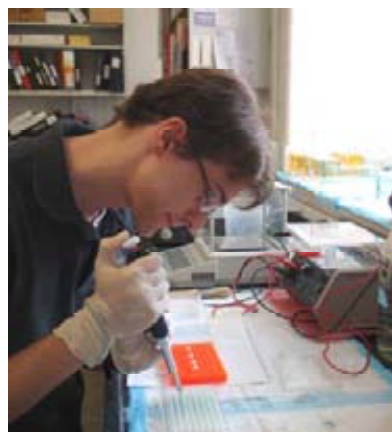
WV-INBRE Summer Students Working In Labs (continued)



Brittany White - Wheeling Jesuit University



Jordan Beckett - West Virginia Wesleyan College



Kiril Tuntevski - University of Charleston



Elizabeth McClung - West Virginia Wesleyan



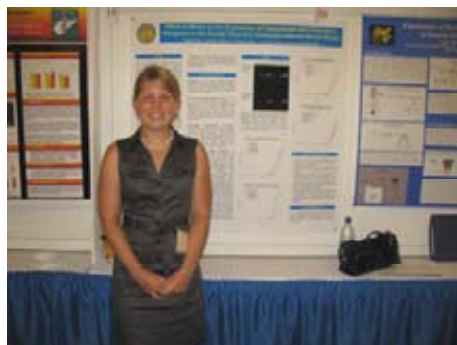
Kylie Morin - Shepherd University

HSTA Graduates Involved in Research at WV-INBRE Network Institutions

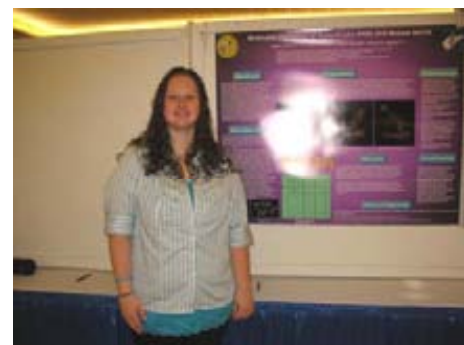
The WV-INBRE program has partnered with the Health Science Technology Academy (HSTA) program which is funded by the NCCR and headquartered at WVU. This alliance hopes to encourage undergraduate students who have demonstrated an interest in biomedical research through their participation in the HSTA program while in high school in West Virginia to participate in biomedical research once they enroll in one of the PUIs.

During the first year of this partnership, 8 HSTA students participated in this program: at Bluefield State College, Kayla Fazio and Jordan Manns worked with Dr. Tesfaye Belay; at Concord University, Jeremy Lloyd worked with Dr. Darrell Crick; at West Virginia State University, Anthony Johnson worked with Dr. Robert Harris; at West Liberty State University, Amber Wilson worked with Dr. Jarrett Aguilar and Kyle McGill worked with Dr. Robert Kreisberg; at West Virginia Wesleyan College, Jacob Wagoner worked with Dr. Timothy Troyer and Kayla Rose worked with Dr. Luke Huggins.

All interns presented their research at the 9th Annual WV-INBRE Summer Research Symposium in Morgantown WV on July 29, 2010. In the photos to the right are pictured five of these HSTA graduates and WV-INBRE students: Kayla Fazio, Jordan Manns, Kyle McGill, Jacob Wagoner, and Amber Wilson, presenting their posters at the symposium.



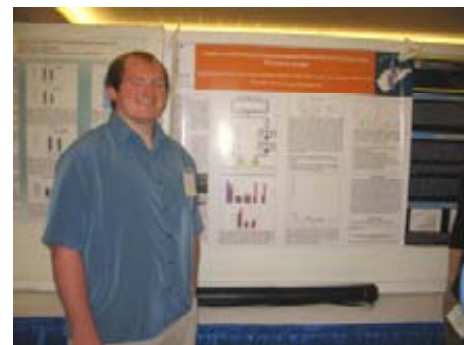
Kayla Fazio worked with Dr. Tesfaye Belay at Bluefield State College



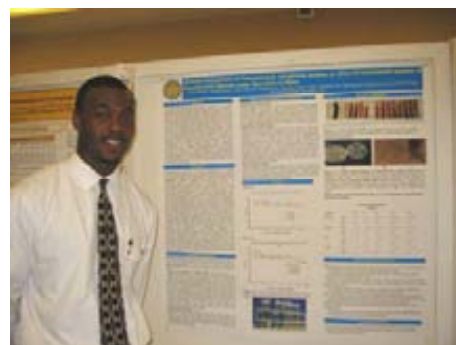
Amber Wilson worked with Dr. Jarrett Aguilar at West Liberty State University



Kyle McGill worked with Dr. Robert Kreisberg at West Liberty State University



Jacob Wagoner worked with Dr. Timothy Troyer at West Virginia Wesleyan College



Jordan Manns worked with Dr. Tesfaye Belay at Bluefield State College

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 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.

This past summer seven teachers participated in the program by conducting a biomedical research project and presenting the results of their projects at the Summer Research Symposium held on July 29th at West Virginia University. HSTA teacher Denise Gipson from Jefferson High School in

Shenandoah Junction, WV, worked in the lab of Dr. Alexey Ivanov at West Virginia University Health Sciences Center; Celia Gwinn from Beckley-Stranton Middle School in Beckley, WV, conducted research under the direction of Dr. Tefaye Belay at Bluefield State College; Wendy Lee from Musselman High School in Inwood, WV worked with Dr. Joan Olson at West Virginia University Health Sciences Center; Dr. Yi Charlie Chen at Alderson-Broadus College served as the mentor for Whitney Reger from Philip-Barbour High School in Philippi, WV; David Ruediger from Roane County High School in Spencer, WV worked with Dr. Shawn Jones at the University of Charleston; Dr. Nalini Santanam at Marshall University directed the research of Myriaha Selbe-Felker from Cabell Midland High School in Ona, WV; and Elizabeth Stanton from North Marion High School in Farmington, WV, worked with Dr. Gregory Dick at West Virginia University Health Sciences Center.

Comments from two of the teachers are presented below:

[Denise Gipson] - *I have a master's degree in biochemistry (from 1988!), and I currently teach chemistry and physical science in Jefferson County. As last summer approached, I had quite a few trepidations about how my INBRE experience would turn out, but it turned out to be wonderful. I enjoyed seeing how much has changed in the 20+ years since I last worked in a research lab and how much has stayed the same. I also enjoyed being in the intellectually-stimulating environment of a university again. Everyone in Dr. Alexey Ivanov's lab, including Dr. Ivanov himself,*



Denise Gipson working in Dr. Ivanov's laboratory

was friendly, interesting, and helpful. Dr. Ivanov gave me a "real" project - not just busy work or housekeeping-type duties and pushed us all (he had a number of summer researchers) to do our best. Although I have a lot of familiarity with scientific journal writing, I had never done a poster before, and under Dr. Ivanov's guidance, I learned how to create one of highly professional quality. In addition, my experience will help me as a high school educator in numerous ways: 1) I gained a much better understanding of how an abstract relates to the entire presentation, which is extremely important with HSTA projects; 2) I received a wonderful update on where biochemical research is focusing today and learned about epigenetics - which didn't even exist 20 years ago; 3) I had the chance to work with all kinds of neat automated equipment that I will now be able to explain to my students - and I plan to do a few DNA technology labs with them; 4) I spoke with everyone I could find of college-type age to see what college is like now so I will be able to target my teaching to the skills students need today; and 5) I became reacquainted with how it feels to learn something new, so I will better be able to relate to my

(continued on page 11)

(Rankin—continued from page 2) around West Virginia.

In Phase II of WV-INBRE, we have added a HSTA-INBRE Coordinator (Valerie Watson, WVU) who is working very closely with Dr. Chester and HSTA program coordinators to help increase the number of these students who go to colleges and universities in West Virginia, connect HSTA

graduates with WV-INBRE funded investigators to continue the student's exposure to biomedical research, and to help track career paths that these students take once they graduate from college.

With the aid of a two-year administrative supplement to our main award, we have been able to provide salary for some HSTA graduates to work in WV-INBRE funded laboratories during the aca-

ademic year and to host five HSTA high school science educators to conduct research in laboratories at Marshall University, West Virginia University and the partner institutions, with WV-INBRE funded research projects, as part of the summer research programs for 2010 and 2011. I look for this interaction between HSTA and WV-INBRE to continue to grow and benefit many students in West Virginia.

(Hankins—continued from page 1)

for conditions treated by neurosurgeons and began his investigations into the pathobiology of meningiomas and schwannomas. Dr. Hankins joined the faculty of West Virginia State University in 2005 after a one-year teaching appointment at Millersville University in Pennsylvania.

Meningiomas comprise approximately 30% of primary central nervous system tumors in the United States. The female-to-male incidence ratio in adults is 2:1 for intracranial tumors and 10:1 for spinal tumors. In part, because of this skewing in prevalence in adult females, suspected factors in meningioma tumorigenesis include the

female sex hormones progesterone and β -estradiol. Hankins' project addresses two central hypotheses: (1) that meningioma tumorigenesis is driven in part by actions of female steroid hormones, and (2) that this tumorigenesis may be mediated in part by progesterone and estrogen receptor containing chromatin-modifying complexes.

By addressing three specific aims of this project, Hankins' group will test these hypotheses. First, they propose to treat meningioma cells with progesterone or 17 β -estradiol and assess expression of genes that are differentially regulated between meningiomas and normal meninges. In the second aim, they will evaluate the effects

of inhibitors of DNA methylation or histone de-acetylation on meningioma cell growth and differentially regulated gene expression. Finally, their third aim is to determine whether the promoters for the differentially regulated genes in aims 1 and 2 are bound by progesterone receptor, estrogen receptor (ETS2), or the histone acetyltransferase p300.

Collectively, these specific aims should contribute to better understanding of the mechanisms underlying meningioma tumorigenesis. Demonstration of the role for female sex hormones in meningioma tumorigenesis could lead to the development of new treatments.

(Continued from page 10)

students as they struggle with new material. But most importantly of all, I saw that INBRE works - two of the summer researchers in Dr. Ivanov's lab caught the research bug and now plan to pursue research careers - which was a surprise to us all, including the students themselves.

[Wendy Lee] - *As a high school science teacher, I found my INBRE experience to be invigorating and useful. In Dr. Olson's lab, I used*



Wendy Lee, from Dr. Olson's lab, speaks at the Summer Research Symposium

techniques in the lab that were new. Technology changes very rapidly in science; so, learning about new

ways to work in a lab is very beneficial to me as a teacher. I may not have the equipment for my students to use on a daily basis but I want them to know that the equipment exists. I will do this through showing the results of my experiments over the summer. I will also be talking about how and why we did the experiments this summer. I hope to pique the interest of my students so they will consider a science major in college.



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