Department of BIOCHEMISTRY

Winter 2016
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The [CATALYST]

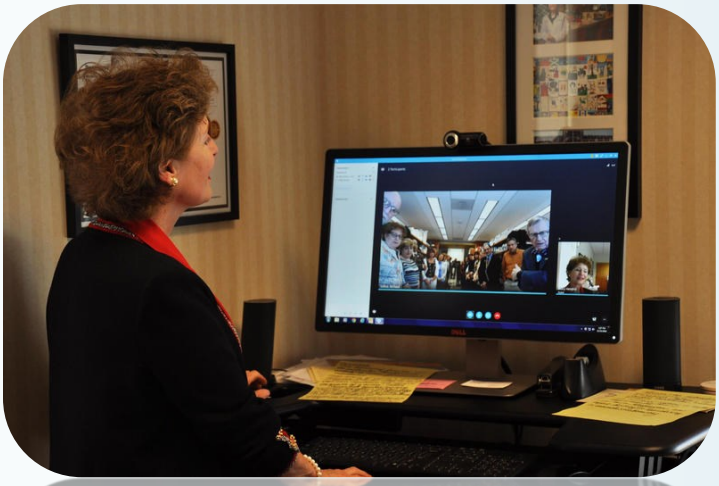
[News & Announcements]

Shepherd University President leads research lab at WVU

Earlier this year when Mary J.C. Hendrix was named president of Shepherd University, she had a critical decision to make: To shut down her research laboratory at Northwestern University or relocate her groundbreaking cancer research closer to Shepherd.

Although Shepherd has strong undergraduate science programs, it does not currently have the laboratory facilities necessary to support a nationally-competitive cancer research team.

The answer came in a unique partnership with West Virginia University, a major R1 research university 150 miles to the west of Shepherd. Thanks to sophisticated Skype technology, Hendrix and her laboratory are able to resume daily research interactions.



Dr. Hendrix talks to WVU President E. Gordon Gee via Skype

"We are grateful to WVU for the opportunity to continue our cancer research and work with talented scientists at the WVU Cancer Institute. Together, we will advance cancer diagnostics and new therapies for the benefit of all West Virginians."

A laboratory team led by Hendrix shook up the cancer research world with a new and controversial theory: that aggressive tumors create their own vascular systems to circulate blood and nutrients from the body to help them rapidly grow.

Continued on Page 2

Inside This Issue

Upcoming Birthdays

Steve Graber	Jan 8
Pete Mathers	Jan 11
Andrew Nickerson	Jan 16
Yuriy Loskutov	Jan 18
Ratnesh Singh	Jan 20
Tanya Dilan	Feb 1
Martin Poncelet	Feb 5
Helen Rodgers	Feb 6
Carol Sholtis	Feb 7
Taylor Thomas	Feb 14
Alexey Ivanov	Feb 15
Paolo Fagone	Feb 24
George Tryfiates	Feb 26
Mike Miller	Feb 28
Drew Shiemke	Mar 6
Kimberly Alonge	Mar 9
Evan Kerr	Mar 10
Jessica Hall	Mar 14
Jing Jie Yu	Mar 14

"Christmas waves a magic wand over this world, and behold, everything is softer and more beautiful."
~ Norman Vincent Peale

[Chair's Corner]

We recently had a party to welcome new members to the Department and celebrate successes; promotions, grants received and papers published. Mike Miller made the observation, looking around the house, of how much the Department has changed over the last 5 years. We have had some turnover, but mostly growth. Most striking were the number of kids – they were everywhere, which reflects the rejuvenation we have seen in the last few years, and our collegiality to bring our families together to celebrate. I honestly believe that this collegiality is in part fueling our successes. Everyone is willing to take the time to help their colleagues, to discuss aims pages, read grants, debate approaches to problems and provide advice in general. Just about everyone has been involved in stimulating discussions about science (sometimes way, way outside the box!), small collaborations to make an experiment happen or formally joining forces to tackle a larger problem. These interactions, some incremental, have contributed to our successes. We have also experienced some frustrations in the past year and regardless of individual success or frustration, we all have more work to do moving forward. The end of the year is naturally a time of reflection, and it's easy to bask in a success or get a little low over some frustrations. It is important to keep some perspective. I think the way to do this at this time of year is to make sure you take a little down time, spend some time with the kids, the family and/or friends. Enjoy their company. Relax and recharge. I hope you all have a safe and very happy holiday!

[News & Announcements cont'd]

It led to a hot scientific debate – chronicled this summer in a retrospective in Science, the magazine of the American Association for the Advancement of Science. The once-radical idea is now the basis for a promising area of cancer research and the development of new therapies, and Hendrix and her research team have continued to experiment and publish in this area. Their latest article appeared in late October in Laboratory Investigation, a journal from the Nature Publishing Group.

President Gee with Richard Seftor

Hendrix was able to move her ongoing research – and several of her team collaborators – from their former laboratory at Northwestern University in Chicago to West Virginia University to continue their work. Elisabeth A. Seftor, Richard E.B. Seftor, and Naira V. Margaryan joined the WVU Cancer Institute's research team this fall and will work in a state-of-the-art lab on WVU's Morgantown campus.

Elizabeth Seftor, Naira Margaryan

WVU President E. Gordon Gee loves the arrangement. "If Shepherd had not hired her as President, she's exactly the kind of researcher we would love to have recruited to move WVU's cancer research program forward," he said. "Now West Virginia has an even better deal – Shepherd gets a nationally-recognized researcher as President and we add to the research strength of WVU. It's a win for everyone."

"It's critical to have an open and convenient way to communicate during our daily work in the laboratory," said Richard Seftor. "Our work benefits from contributions of all members of our group, including President Hendrix. We can plan and discuss experiments as a group, and discuss results as soon as they are generated."

An open video portal for Skype communication is available every day to facilitate the rapid interactions between the researchers at WVU and Hendrix -- to conduct data analysis, proposal and publication preparation in real time. "This is a new era in communication platforms, and we are the first in the state to advance this application for cancer research," Seftor said.

"The scientific man does not aim at an immediate result. He does not expect that his advanced ideas will be readily taken up. His work is like that of the planter - for the future. His duty is to lay the foundation for those who are to come, and point the way."
~ Nikola Tesla

[Recent Publications]

- Grosso F, **Stoilov P**, Lingwood C, Brown M, Cochrane A. "Suppression of Adenovirus Replication by Cardiotonic Steroids." J Virol. 2016 Nov 23. pii: JVI.01623-16. [Epub ahead of print] PubMed PMID: 27881644.
- Perry MD, **Rajendran VM**, MacLennan KA, Sandle GI. "Segmental differences in upregulated apical potassium channels in mammalian colon during potassium adaptation". Am J Physiol Gastrointest Liver Physiol. 2016 Nov 1;311(5):G785-G793. doi: 10.1152/ajpgi.00181.2015. PubMed PMID: 27609768; PubMed Central PMCID: PMC5130553.
- Contreras L, Ramirez L, **Du J**, Hurley JB, Satrústegui J, de la Villa P. "Deficient glucose and glutamine metabolism in Aralar/AGC1/Slc25a12 knockout mice contributes to altered visual function." Mol Vis. 2016 Oct 12;22:1198-1212.
- **Du J**, Yanagida A, Knight K, Engel AL, Vo AH, Jankowski C, Sadilek M, Tran VT, Manson MA, Ramakrishnan A, Hurley JB, Chao JR. "Reductive carboxylation is a major metabolic pathway in the retinal pigment epithelium." Proc Natl Acad Sci U S A. 2016 Dec 1. pii: 201604572. [Epub ahead of print]
- Gu H, Carroll PA, **Du J**, Zhu J, Neto FC, Eisenman RN, Raftery D. "Quantitative Method to Investigate the Balance between Metabolism and Proteome Biomass: Starting from Glycine." Angew Chem Int Ed Engl. 2016 Dec 12;55(50):15646-15650. doi: 10.1002/anie.201609236.
- Hendrix MJ, Kandela I, Mazar AP, Seftor EA, **Seftor RE**, Margaryan NV, Strizzi L, Murphy GF, Long GV, Scolyer RA. "Targeting melanoma with front-line therapy does not abrogate Nodal-expressing tumor cells." Lab Invest. 2016 Oct 24. doi: 10.1038/labinvest.2016.107. [Epub ahead of print]
- Hendrix MJC, Kandela I, Mazar AP, Seftor EA, **Seftor REB**, Margaryan NV, Strizzi L, Murphy GF, Long GV and Scolyer RA. "Targeting melanoma with front-line therapy does not abrogate Nodal-expressing tumor cells". Laboratory Inv., In Press, 2016.
- Zhang L, **Du J**, Justus S, Hsu CW, Bonet-Ponce L, Wu WH, Tsai YT, Wu WP, Jia Y, Duong JK, Mahajan VB, Lin CS, Wang S, Hurley JB, Tsang SH. "Reprogramming metabolism by targeting sirtuin 6 attenuates retinal degeneration." J Clin Invest. 2016 Dec 1;126(12):4659-4673. doi: 10.1172/JCI86905.

[Biochemistry Christmas Luncheon]

10 Things you didn't know about:

Abigail Moye

The Basics
Title: Graduate Student
Office/Lab: Ramamurthy/Eye Institute

1. **What was your very first job?**
I was a server at Coldstone Creamery. I loved that job! I got a free ice cream every day, always smelled good after work (like cinnamon waffles!), got to serve ice cream – which makes people happy – and even when I had to wash dishes, it was yummy stuff. Plus, you got to sing when people tipped you, which was always fun.

2. **Weirdest food you've ever eaten?**
I have tried very many weird foods throughout my life for two reasons 1) my father is a huge foodie and 2) I lived in Europe for a few years as a child. If I had to pick though, it would definitely be fish eyeballs. Since you're served the entire fish in Italy (head and all), I would go around the table and ask people for theirs because I thought they were yummy. Who knew I'd end up working on eyes in the future!

3. **Least favorite thing to do in the lab?**
Anything I have to do consistently that takes more than a day. Be it westerns, cutting and staining sections, ERGs… unless it's a new result I'm looking for haha.

4. **Any phobias?**
I am incredibly frightened of frogs. I have no idea where this phobia came from, but just thinking about them gives me the heebie jeebies.

5. **Has anyone ever said you look like a celebrity? If so, whom?**
People have said I resemble Amanda Seyfried (from Dear John, Mamma Mia, etc.). Actually, that if my sister and I were merged together we would look like her.

6. **Favorite guilty-pleasure TV show?**
I cannot stop watching Vanderpump Rules (reality show on BRAVO about servers in a restaurant in LA). I'm not usually a BRAVO fanatic, but this is definitely my guilty pleasure show.

7. **Any special talents?** *(e.g. juggling, singing, dancing…)*
In high school I was incredibly involved in the arts. I sang, acted, danced, I was on the Speech Team. I still enjoy all of those things, in fact Drew and I did a choreographed First Dance for our wedding this summer.

8. **Were you voted 'Most Likely To…." Something in your high school yearbook? If so, what?**
I was voted "Best Smile" in high school.

9. **Where/when did you meet your significant other?**
I actually met Drew (my husband) while we were children in Italy. Both of our fathers were in the Navy. I had a major crush on him when I was little actually, but with Navy families you move about every 3 years, so we just stayed friends throughout the years and eventually reconnected as adults.

10. **When you were a child, what did you want to be when you grew up?**
I had many aspirations as a child. I had planned on being a doctor and actress during the school year, and taking the summers off to pursue dancing. I didn't really pick an actual career path until my sophomore year of college.

[Reflections On Morgantown]

"People say that time changes things, but you actually have to change them yourself" ~ Andy Warhol

My journey to Morgantown was a winding road. It began at the University of Calgary in Alberta Canada where I was initially enrolled as a political science major. However, that all changed during a junior biochemistry class when I learned that RNA could perform catalytic reactions, and that these "ribozymes" were likely how life on earth started. I was hooked.

I switched my major and focused the next several years characterizing how self-splicing group II intron ribozymes splice and jump to new locations in genomes. As I came to the end of my time as a graduate student I felt that my training lacked *in vivo* methods experience. Significant upheaval was needed: Move to another country, change my research focus along with all the methodology I had spent years perfecting. Taking the plunge, I landed at UC Berkeley where I worked on telomerase assembly and activity in human and ciliate cell culture. After a few years an opportunity arose to return to the splicing field with a structural biology focus. Armed with limited training in structural biology I moved south to UC San Diego to tackle the daunting task of large
RNA crystallography. The years in California were rewarding, but the most significant events were meeting my wife Meredith and the birth of our daughter Sloane. Relocating to West Virginia was the easiest change we've made to date. Morgantown had what I was looking for in a department to grow my brand of science, and it is a great town to raise a family in.

Starting a new research program is a challenging endeavor, but the transition to Morgantown has been incredibly positive thanks to the welcoming environment of the Biochemistry Department. I especially want to thank our stellar front office for all their assistance and support in helping my lab get up and running. I also appreciate the collaborative spirit of our department, the sense of community is greater than I've felt at any other institution. Although I've never lived in a small town my family and I have had a lot of fun exploring the Morgantown area. From hay rides at Halloween, cutting down a Christmas tree, to a historical rail car ride with Santa Claus, I'm always surprised at the charm our new home has to offer.

Although I do wish that Morgantown had more sidewalks and wider roads, it is refreshing to have seasons again. I'm actually looking forward to snow! I hope the holiday season brings joy to all our department members, and I look forward to many crystallizing moments in the new year.

- Aaron

[Meet Our New Staff]

Bohye Jeong, Lab Technician
Lab: Dr. Stoilov

Hello everyone! My name is Bohye Jeong. This name for sure is not familiar for you. Yes! I am from the capital, Seoul, in South Korea. Do you know how far it is from here? It took me 14 hours to fly to the United States. So, why do I want to come to the US?

There are two reasons. The first reason is because of my small dream to study in different places. When I was little, I really wanted to study in different places to make eyes-wide and have a lot of different experiences by meeting different people. However, I could not do that because my mom really LOVES me and wanted me to study near her until the 12th grade! (Of course now, I miss my mom taking care of all of my things). After the 12th grade, she said YES to letting me move, and she has continued to support me, even now (THANK YOU SO MUCH, MY lovely MOM).

The second reason for wanting to come to the US is thanks to my principal from a private academic institution, which is like after-school academic program in Korea. He recommended that I come here in to the US to pursue my dreams and more.

Due to these reasons, I went to Wisconsin first. I started in an ESL program (English as a Second Language program for international students), then I entered the University of Wisconsin- Stevens Point (UWSP). From there, I studied biochemistry and worked for a biofuel institution for the faculty's research.. I also joined and worked as officer in the Korean Club and International Club. I met a lot of international students, which I would not have had opportunity to do so if I had studied in my home country. It was really fun to meet new people from different countries, which helped me learn about many different culture backgrounds. Also, I realized that people are the same, and the cultural things are just one factor to affect their view. After I graduated from UWSP with Biochemistry in May 2016, I was offered a job here at WVU and moved down to Morgantown for another journey in my life. (Yay! Escaping from cold place!).

This town, Morgantown, West Virginia, I heard, is my parents' generations dream place because of John Denver's song. When I told my parents that I am going to Morgantown in West Virginia, they immediately said they want to come and see this place. Thanks to John Denver, my parents came before Thanksgiving and I enjoyed my time with them over America's big holiday. Also, my move was easily completed and they helped me with getting used to living in this new environment these days. Now, I am working with Dr. Peter Stoilov as a biology technician. I am enjoying this work, learning from this work, and will continue to study this area more and more for my dream!! l would like to thank everyone who has supported and encouraged me thus far!

Celine Brooks, Research Technician
Lab: Dr. Sokolov

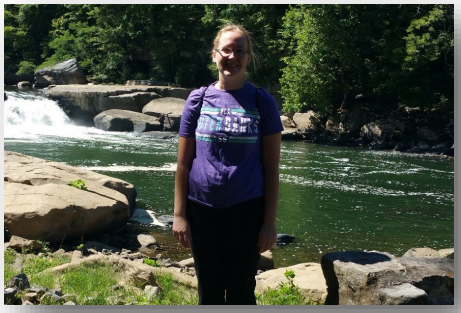
I was raised in a small coal mining town located in the Appalachian Mountains. You may have heard of it from the book series, Big Stone Gap by Adriana Trigiani, or the film, Big Stone Gap. Both are named for my hometown, and the movie was actually shot there. Like most children born in the Gap, I went to the local public school, Powell Valley (now Union High School), and graduated in 2012.

Four years later, I graduated from Mary Baldwin University in Staunton, Virginia

[Meet Our New Staff, Cont'd]

with a B.S. in Psychology and Chemistry, with an emphasis in Biochemistry. Before continuing my education, I decided to take a break for a couple of years and moved in with my sister, who is a graduate student at WVU. Since moving to Morgantown, I signed my first apartment lease, and started my first full time job as a biology technician with Dr. Max Sokolov at WVU Eye Institute.

After working with Max for four months, I have learned more about the processes of



phototransduction and protein trafficking than my college self would have expected. I also have been reminded that research always comes with more failed attempts than successes, but when I finally get it right all the do-overs seem worth it. When I am not in lab genotyping mice or running western blots, I am out hiking on one of the many trails in the area, or at home reading a book.

Brittney Rogers, Lab Technician
Lab: Fagone/Core Facility

I am the new core technician for the Cancer Institute, and based out of Paolo Fagone's lab in the Biochemistry department. I just recently moved from Cecil County, MD (about a 4 hour drive from Morgantown).

I attended Salisbury University on Maryland's Eastern shore, and for the past two years, I studied to get my Master's at University of Delaware. During my time there, I worked for a Biotech company that specialized in a variety of fields from biodefense to therapeutics. I am very excited to carve out my place here, and see the impact this new position will make. Hopefully I will be able to provide services that are beneficial and save time for multiple labs!

When I graduated at the end of summer, I decided to completely uproot my life to relocate to Morgantown. My boyfriend has been here since 2011, and is now in his 2nd year of medical school here at the University. We decided that after over 8 years of being together, 5 years of living in different states was long enough!

Since I've been here, I've been enjoying some of the activities Morgantown has to offer. I have gone to my first football game, hiking, and met a lot of new people. I have loved living here so far, but of course I miss my family a lot. I will always be a Marylander at heart, but West Virginia already feels like home!

Naira Margaryan, DVM, Ph.D., Senior Research Scientist Lab: Dr. Seftor

I obtained my DVM degree from the Yerevan Zootechnical Veterinary Institute, Yerevan, Armenia (Diploma with Honors) and my Ph.D. from the Institute of Physiology after Orbeli of the National Academy of Sciences, Yerevan, Armenia.

I joined the Mary Hendrix group in 2001 at the University of Iowa where I was responsible for all the animal work in addition to performing the histology on patient derived xenograft (PDX) models of cancer. In 2004 I moved to the Ann and Robert H. Lurie Children's Hospital of Chicago with the Hendrix group where I continued overseeing the in vivo cancer models and subsequent histological analyses of key proteins expressed in the tumor microenvironment. During the past 4 years I have served as the director of the Stanley Manne Research Center Histology Core where I provided histology and IHC (immunoperoxidase) services to several researchers at Northwestern University/ Lurie Children's Hospital.

[Appalachian Regional Cell Conference (ARCC)]

"I absolutely love going to the ARCC. This year was hosted by WVU, headed by the President of the CBTP, Ashley Brandebura, and she did an amazing job! It is always really exciting to learn how much cutting edge science is being performed right here in our region. This year I won 1st place for my poster presentation in the neuro group. Honestly, I couldn't have been more surprised! The competition was so strong from not only the other schools, but particularly from WVU, that I didn't think I stood a chance. I hope to continue attending this conference and networking with my peers from this region in the future."
~ **Skye Hickling**

"I won 1st place poster at the ARCC conference. I thought there were a lot of diverse oral presentations. This conference offers a small time conference feel but with high profile keynote speakers. The ARCC conference also provides a platform for students to practice their oral presentations to a general audience in a relaxed atmosphere.

The food and coffee were not good but transportation was relaxing. If I were here next year, I would go again. I recommend this conference not only to the older students but to younger 1st and 2nd year students as well."
~ **Kimberly Alonge**

This year WVU hosted the 5th annual Appalachian Regional Cell Conference (ARCC). The conference was originally organized by four universities: WVU, Marshall, UK and OU. The purpose is to connect research universities across the Appalachian Region and to provide a forum to set up collaborations. This year we were able to expand the conference and include more schools, including West Virginia State University and Fairmont State University. We wanted to perform an outreach to schools with active INBRE programs this year so that undergraduates at smaller schools without large research programs can have access to attend a research conference. Dr. Alfred Goldberg of Harvard University was our Keynote Speaker this year. He gave an intriguing talk on the history of the discovery of the proteasome and designing therapeutic agents to target the proteasome in disease states. Many WVU students one first and second place prizes for posters in the categories of Neuroscience, Development and Diabetes. Aaron Snoberger from Dr. Smith's lab was selected to give an oral presentation and he won first place in the oral presentation competition.
~ **Ashley Brandebura**

"My mission in life is not merely to survive, but to thrive; and to do so with some passion, some compassion, some humor, and some style."
~ Maya Angelou

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[Coffee Break]

The Big Bang Theory

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G	N	A	B	G	I	B	R	A	J	E	S	H	L
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SCIENTIST
RAJESH
STUART
COMIC BOOK
SPACE
SCIENCE
PHYSICS
PASADENA
BIG BANG
LEONARD
HOWARD
CHEESECAKE
WOLOWITZ
AMY
THEORY
SHELDON
CALTECH
OCD
PENNY

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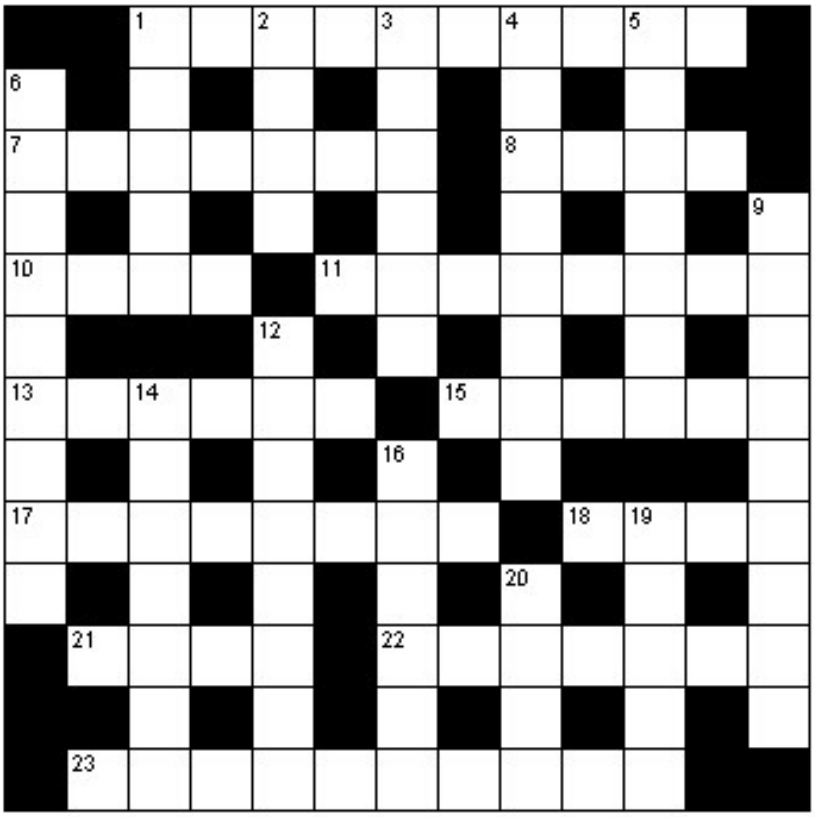


Across

1 Holy journey (10)
7 Obvious (7)
8 Period (4)
10 Weak spot of Achilles (4)
11 Souvenir (8)
13 Medical practitioner (6)
15 Groups of twelve (6)
17 Indoor footwear (8)
18 Wet weather (4)
21 Fete (4)
22 Something offensive to look at (7)
23 Local charity organisation (5,5)

Down

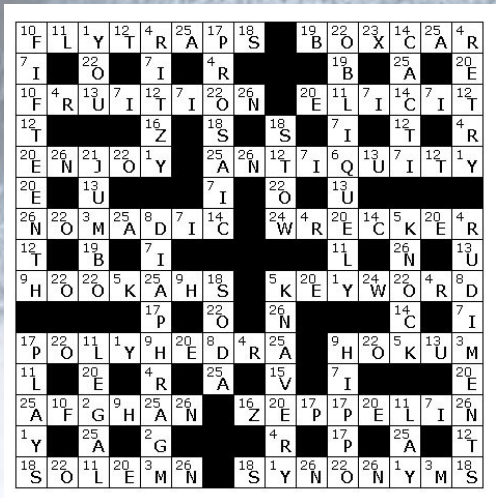
1 Balance (5)
2 Untruths (4)
3 Putrid (6)
4 Figure of speech (8)
5 Rubbish (7)
6 Wesleyan (9)
9 Staff (9)
12 Grumble (8)
14 Large city in Illinois (7)
16 The East (6)
19 Dwelling-place (5)
20 Pavement edge (4)

Crossword Puzzle answers located on the back page [No L  KING…]

[Upcoming Events]

WVU and Morgantown Upcoming Events (December 2016-March 2017)

December			
12/23/2016	Winter Holiday	University Closed	WVU Holiday
12/26/2016	Christmas (Observed)	University Closed	WVU Holiday
12/27/2016	Winter Holiday	University Closed	WVU Holiday
1/2/2017	New Year's Day (Observed)	University Closed	WVU Holiday
1/8/2017	Nature in Winter WV Botanic Garden - www.wvbg.org/	1-4 PM	West Virginia Botanic Garden
1/10/2017	Faculty Meeting	12-1 PM	George Wirtz Memorial Library
1/12/2017	Research Forum	4:00 PM	TBA
1/16/2017	MLK Birthday WVU	University Closed	WVU Holiday
1/26/2017	Research Forum	4:00 PM	TBA
1/28 & 29/2017	Discover the Dinosaurs - www.mylanpark.com/events/	TBA	Mylan Park
1/31/2017	Spring 2017 Seminar Series Richard Kahn, PhD	12-1 PM	3067 HSC North
2/9/2017	Research Forum	4:00 PM	TBA
2/11/2017	Cabin Fever Craft Beer Festival - wvbeerfest.com/	12-6 PM	Mylan Park Ruby Community Center
2/14/2017	Faculty Meeting	12-1 PM	George Wirtz Memorial Library
2/22/2017	External Review		
2/23/2017	Research Forum	4:00 PM	TBA
3/4 to 3/12/2017	Spring Recess (students)		
3/10/2017	WV Home Builders Show - www.mylanpark.com/events/	TBA	Mylan Park
3/14/2017	Faculty Meeting	12-1 PM	George Wirtz Memorial Library
3/16/2017	Research Forum	4:00 PM	TBA
3/23 & 24/2017	E. J. Van Liere Days		WVU Health
3/28/2017	Spring 2017 Seminar Series Douglas Vollrath, PhD	12-1 PM	3067 HSC North



Check out the Biochemistry Website