

THE [CATALYST]



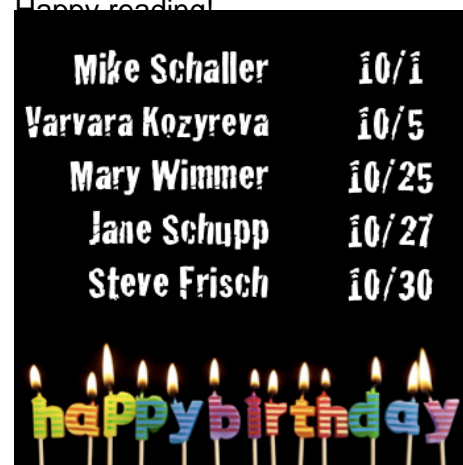
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[October Preview]

Greetings and happy October everyone! We hope you all enjoyed our first issue of *the[Catalyst]* last month—we've had a lot of positive reviews and suggestions that I hope make this second issue even better. This month, we have a couple of featured articles written by two of our senior graduate students. **Holly Cyphert** reviews a hot-off-the-presses article that highlights the benefits of exercise on our brains (page 4), and **Zach Hartman** gives us an insightful look at the life and times of one of the 20th century's most prolific biochemists, Otto Warburg (page 3). Also, this month's *Spotlight* on

Bill Wonderlin (page 5) is sure to inspire you to pull out your aviator sunglasses while you're enjoying the fall colors this weekend. Happy reading!



Did we miss someone? Please let us know via email asuchanek@hsc.wvu.edu

[Chair's Corner]

The first issue of the Catalyst was a great success in the Department. This second issue is highlighted by articles by two graduate students in the program, Holly Cyphert and Zach Hartman. Thanks for your contributions! Recent events in the Department include initiation of the Distinguished Faculty and Alumni Seminar Series. Dr. Pragna Patel, Professor of Biochemistry and Molecular Biology at the University of Southern California and graduate of Mike Miller's laboratory, was the inaugural speaker in the series. In mid-October, Dr. Vinay Pathak, Head of the Viral Mutation Section in the HIV Drug Resistance

Program at the NCI and a former faculty member in the Department, will present the second lecture in the series. You might also be interested in an article planned for the next issue of the Catalyst. In response to a student's question "Why is this the Wirtz library?", Amanda is planning an article profiling Dr. George Wirtz, a member of the faculty from 1963-1993. In the issue, she also plans to highlight one or two graduates from Dr. Wirtz's laboratory in the Alumni Spotlight.

-Mike

**Have you seen the
Biochemistry
Timeline??
Check it out on the
Department website!**



[News & Announcements]

The Appalachian Regional Cell Conference, a graduate student-sponsored workshop will be taking place next **Friday, October 12** in Charleston, West Virginia.

The goal of this scientific meeting is to foster interactions among students at four universities within the Ohio Valley/mid-Appalachian region: West Virginia University, Marshall University, the University of Kentucky and Ohio University. The conference will encompass one graduate student oral presentations selected by the student organizers committee, a keynote speaker, Vinay Pathak from NCI, and 40 poster presentations between the four universities. The goal of this inaugural meeting is to provide an atmosphere where graduate students, postdoctoral students and faculty can come together and exchange scientific ideas about their research in the area of cell biology.

Funded by the American Society for Cell Biology and the Office of Research & Graduate Education, WVU Health Sciences Center

Have an announcement or news story? Submit it to
asuchanek@hsc.wvu.edu
Deadline for submissions will be the 20th of each

[From the Editor]

By Amanda Suchanek



Rocking my scooter down the hall...watch your toes!

The last month has absolutely *flown* by, as it often does when the calendar is full. The first-year students are about

finished with their first rotations, the leaves are turning all kinds of gorgeous colors, and football season is in full swing. As I sit here putting together this issue, I find that I am grinning to myself as I read over the contributions we've had from around the department. While grinning to myself probably looks pretty creepy to passersby (and there are a lot of them down here at Cavanaugh's!), it's really hard to stop. I am having so much fun getting to

know people as I put this newsletter together and finding out things I never would have guessed...or at least some things I never would have guessed ☺. We have students who are great writers, some very distinguished alumni, faculty with rock-and-roll star aspirations—and that's only the first couple of issues! Anyway, I hope that everyone reading this is having as much fun as I am and that it continues to get better and better in the coming months. *Salut!*

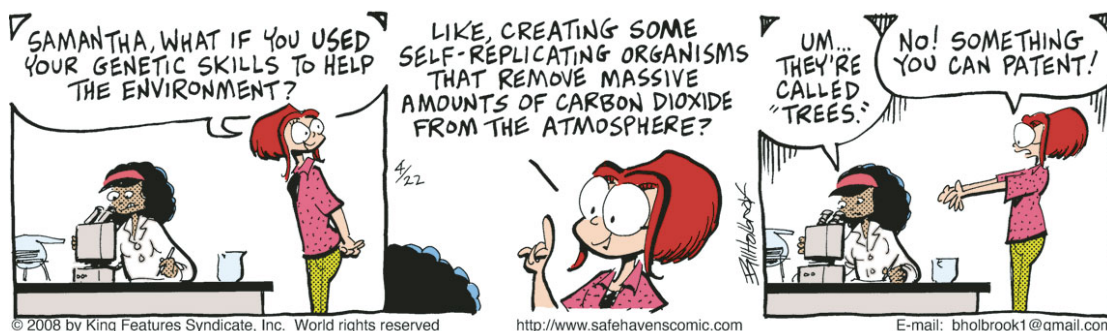
While grinning to myself probably looks pretty creepy to passersby...I find it hard to stop!

Fun Fact:

Did you know that the sweetener saccharin—the stuff you find in those little packets of Sweet n' Low—was discovered because the chemist behind it didn't wash his hands before he ate dinner?



Scan the QR code above to read more about this and other accidental discoveries!



[A Name You've Heard Before]

By Zach Hartman



Any cancer researcher worth his or her salt has been exposed to metabolomics in cancer. Recent studies show the importance of metabolic dysfunction in tumor initiation and progression. Inevitably, in the world of cancer metabolism, you will hear about the so-called Warburg effect.

First and foremost, that's Warburg with a "v" sound which doesn't sound like that West Virginian idiosyncrasy, "to warsh the dishes." Don't draw the ire of the linguistic finger waggle. The finer points of pronunciation aside, the Warburg effect describes the tendency for tumors to use glycolysis for energy production, even under normoxic conditions. This acts as the foil to the Pasteur effect which states that fermentation is inhibited by oxygen. Whole careers have been built upon the molecular biology of the Warburg effect, but this little write-up is not the place to get into that, per se. What I

want to explore is Otto Warburg, the man. For he is (was; he's long dead now) one of the eminent scientists of the modern era.

Consider the greatest scientists in terms of Nobel pedigree. Only a few have won multiple prizes. Linus Pauling made great leaps in our understanding of chemical bonding. Then he went on to win a Peace Prize. Marie Curie and Frederick Sanger each won two within the sciences. Warburg was a winner of one and a frontrunner in another. Legend has it that a decree by Hitler in 1937 that Germans would no longer accept Nobel Prizes all that stopped the receipt of a second award. On top of his own accomplishments, Warburg trained Hans Krebs and Axel Theorell, Nobel laureates in their own right.

Otto Warburg's self-confidence was so great that he submitted a research proposal in a single sentence: "I require 10,000 marks." The German government's confidence in Warburg was so great that they granted the funding in full, despite the crippling economic conditions in the post-war Weimar Republic (circa 1921). His devotion to cancer research won so much acclaim that, despite his Jewish heritage, when he was later asked-as politely as the Nazis were known to ask- to stop his research, the edict was intervened by none other than Hitler himself. Cancer research was of particular interest to the Chancellor, for he was deathly

afraid of contracting the disease. In response to the anti-Semitic atmosphere that covered Germany during World War Two, Warburg wrote to his sister, "I was here before Hitler." And what was the Nazi party's reprisal? Appointment to a national anti-cancer committee in Germany.

So the Warburg effect is what we tend to focus upon, at least in our journal clubs. He was not awarded the Nobel Prize for his work leading to this hypothesis. He discovered Cytochrome c oxidase, the enzyme that helps to power ATP synthase during oxidative respiration. In fact, Warburg was one of the first biochemists to reason that respiratory enzymes must contain a heavy metal, since cyanide was both known to bind heavy metals and inhibit respiration. To enable his findings, Warburg went ahead and invented the spectrophotometer. No big deal. That protein quantification assay



Otto Heinrich Warburg in his laboratory, October 1931.

Photographed by Georg Paul, German Federal Archives

Continued from page 3

impact on biochemistry and cellular biology is difficult to assess. Without the development of his assays, the foundation may not have been laid for research as we know it today. Certainly, his hypotheses were not infallible. He held throughout his life that damage to the respiratory

pathway was basically the only requisite event in carcinogenesis. It is not hard to demonstrate, however, that disrupted metabolism alone will not cause cancer. All in all, though, his work laid one of the early, important foundations for our investigations in oncology.

We owe Otto Warburg a debt of gratitude, so it's valuable to know a little more about him than an erroneous pronunciation of his name.

[Exercise: It does your hippocampus good]

By Holly Cyphert



Holly protecting her hippocampus from oxidative damage by running the 2011 New York City Marathon.

Hello Biochemists!! For the last few months of my tenure here at WVU, I thought that I would contribute to the newsletter by adding a review of a new paper that talks about the benefits of exercise. I have been a long believer that exercise is truly the best medicine for stress and the occasional hangover. In the past decades, research has been trying to truly understand why/how exercise is beneficial at a molecular level and trying to ~~manipulate these signaling~~ cascades to alleviate obesity

and diabetes. (Don't we all want an exercise pill so we can eat McDonalds every night and never see cellulite or a muffin top?) To this end, I found an interesting paper in Neuroscience that describes the effects of exercise on cognitive thinking and the hippocampus with a link to aging.

In the article "Long-term exercise treatment reduces oxidative stress in the hippocampus of aging rats," Marosi, et al. exercise 12-month old (menopausal) Wistar rats for 15 weeks and monitor molecular events in the hippocampus. Following this exercise regiment, the hippocampus of exercised rats had a lower level of reactive oxygen species (ROS) and protein carbonyls. Additionally, these animals had an increase in superoxide dismutase, PGC-1α, and pAMPK levels. These results suggest that exercise enhances antioxidant properties to preserve neurons against aging. Although cognition wasn't

tested in this study, it has been shown that following exercise, animals have an increased ability to learn and remember using water maze tests. It would have been nice to see some functional data (i.e. water maze tests) with this study along with male to female differences. All in all, the paper does a nice job of demonstrating the molecular cues of exercise in the hippocampus and reveals some of the signaling cascades that are involved. So the next time you need motivation to do a workout, just think about the oxidative stress in your hippocampus following a long day at the bench. I'll see you at the gym!

Reference:

Marosi, K., Bori, Z., Hart, N., Sarga, L., Koltai, E., Radak, Z., and Nyakas, C. Long-term exercise treatment reduces oxidative stress in the hippocampus of aging rats, Neuroscience. 2012 Epub Ahead of Print

Don't we all want an exercise pill so we can eat McDonalds every night and never see cellulite or a muffin top?

10 Things you didn't know about Bill Wonderlin!



Now: Bill and Linda hiking in the Adirondacks

The Basics:

Title: Associate Professor

Lab/Office: 3148

1. What was your very first job?

In grade school I sold nightcrawlers to a local marina for a penny apiece...a very slimy way to earn the \$10 I needed to buy a transistor radio.

2. If you had to do it all over again, what would you study in school?

I would study to be a movie director.

3. How many times, if any, did you change majors?

I was very involved in music in high school, and I entered my undergraduate studies with an interest in studying music because I wanted to be a rock-and-roll keyboard player (Keith Emerson and Rick Wakeman were my heroes, and they were classically-trained musicians). But, after seeing the amazing natural talents of the other students in music, I chose the more practical career of becoming a primate paleontologist. After a couple of years in Duke's Anthropology graduate program, I discovered electrophysiology while working part-time in

a lab at the Environmental Protection Agency, and I finally settled into my current career path.

4. Have you ever broken the law?

I have been relatively well behaved in recent years. But, having been in college for six years during the 1970's, I might have broken the law a few times.

5. Favorite junk food?

It used to be little chocolate-covered donuts. Now it's chips and salsa.

6. Biggest pet peeve?

Inappropriate cell-phone use has pushed everything else off the list.

7. 5 things you couldn't live without?

Linda, green tea, the great outdoors, a workshop, snow.

8. Least favorite thing to do in the lab?

Clean it.

9. Most embarrassing moment?

I have always devoted a great deal of effort to avoiding major embarrassments, and the ones that have slipped through aren't worth mentioning.

10. If you could have dinner with any historical figure/world leader/scientist/celebrity, who would it be and why?

Abraham Lincoln. I would like to hear his view of our world today. He had a remarkable ability to interpret or explain the complexities of the human condition in a few words. I also admire his ability to do the "right thing", even when it wasn't the popular thing to do, and I wonder what course he would follow in the new millennium. Also, we are both from Illinois.



Then: mid-70s rock & roll

the[Spotlight]

[Newsday Crossword]

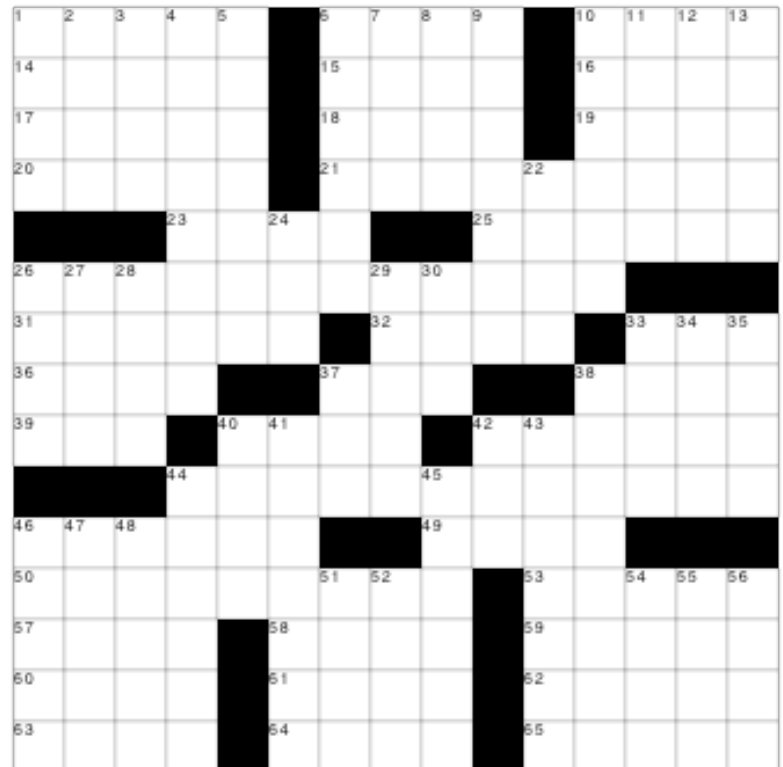
10/04/12 AT THE TABLE Bruce Venzke, edited by Stanley Newman

Across

- 1 Gallic word of gratitude
- 6 "Ornery" guy
- 10 Dolphin family member
- 14 Mythical hunter
- 15 Aware of
- 16 When shadows are shortest
- 17 Missile holders
- 18 Bank guarantor
- 19 Get tired
- 20 Telltale sign
- 21 Warehouse machines
- 23 Except for
- 25 Most distressed
- 26 Bobby Darin tune
- 31 Banks (on)
- 32 Possible babysitter
- 33 Seek clarification
- 36 OPEC member
- 37 Some auction offerings
- 38 Pay-stub acronym
- 39 Soak
- 40 Wind-powered toy
- 42 Applied, as flattery
- 44 Radar gun target
- 46 Ambulatory
- 49 Big brute
- 50 Long-beaked wading bird
- 53 Released for home viewing
- 57 Subsequent
- 58 Encircled by
- 59 Draft depositor
- 60 Author Harte
- 61 Long look
- 62 Last Greek letter
- 63 "Mi _ _ es su . . ."
- 64 "Lion King" villain
- 65 Auto type

Down

- 1 Forest growth
- 2 Google exec Schmidt
- 3 Churn up
- 4 Crockett's cap



Puzzle (c) Stanley Newman, distributed by Creators Syndicate, Inc.

Hosting & Software (c) PZZL.com

- material
- 5 Ordain
- 6 Brazilian export
- 7 Cancel
- 8 Move slightly
- 9 Closes due to fog
- 10 Doing amazingly well
- 11 Pocahontas' hubby
- 12 Covers thickly
- 13 Extreme unease
- 22 Converted attic space
- 24 TiVo precursor
- 26 MD's orders
- 27 Prefix in aviation
- 28 Reward the cast
- 29 Dinesen's real first name
- 30 Aficionado
- 33 Verdi masterpiece
- 34 Person from Paisley
- 35 Batman creator
- 37 Eroded
- 38 Data identifier
- 40 Ceramist's equipment
- 41 Swelling reducers
- 42 Relay race segment
- 43 Well-chosen
- 44 Joe Jackson in "Field of Dreams"
- 45 Welder's adhesive
- 46 "Hardball" network
- 47 33 Down, for instance
- 48 Movers' supply
- 51 All-in-one computer
- 52 Entertainer Minnelli
- 54 Turned blue, perhaps
- 55 Star in Lyra
- 56 Senior member



Upcoming Events

October 2012



Quote of the Month:

“Every great advance in science has issued from a new audacity of imagination.”

• • •

John Dewey



| Date | Event | Time | Location |
|-------|--------------------------------------------------------------------------------------------------------------------------------|---------|-----------------------------|
| 10/4 | Seminar: Dr. Pen Jen (PJ) Lin <i>Faculty Candidate Texas A&M University</i> | 2pm | E216 Eye Institute |
| 10/4 | Research Forum <i>Smith Lab</i> | 4pm | Erma Byrd 201 |
| 10/6 | Ghandi Day 5K | 9am | Marilla Park Picnic Shelter |
| 10/9 | Seminar: Dr. Geraldine O'Neill <i>The University of Sydney</i> | 12pm | 3067 HSN |
| 10/10 | Lecture: Dr. David Agus <i>Author of <u>The End of Illness</u> David C. Mackay Festival of Ideas Lecture Series</i> | 7:30pm | Erikson Alumni Center |
| 10/11 | Seminar: Dr. Vinay Pathak <i>National Cancer Institute</i> | 4pm | Erma Byrd 201 |
| 10/12 | Appalachian Regional Cell Biology Conference | All Day | Charleston, WV |
| 10/13 | LKS Making Strides for Breast Cancer Walk | 9am | Ruby McQuain Park |
| 10/17 | Seminar: Dr. Shulin Ju <i>Faculty Candidate Brandeis University</i> | 12pm | E216 Eye Institute |
| 10/18 | Research Forum <i>Agarwal Lab</i> | 4pm | Erma Byrd 201 |
| 10/23 | Seminar: Dr. Steve Byers <i>Georgetown University</i> | 12pm | 3067 HSN |
| 10/25 | Research Forum <i>Mulligan Lab</i> | 4pm | Erma Byrd 201 |
| 10/27 | Monster Mash Dash 5K | 11am | WVU Student Rec Center |
| 10/27 | Greater Morgantown Heart Walk | 9am | Mylan Park |
| 10/27 | Mountaineers Run United 5K Run/Walk | 10am | Mountainlair |
| 10/30 | Seminar: Dr. John Hollander <i>WVU Exercise Physiology</i> | 12pm | 3067 HSN |

Have an announcement, idea, or story you would like featured in the[CATALYST]? Send them to Amanda at asuchanek@hsc.wvu.edu
Deadline for submissions will be the 20th of each month at 5pm.

[Answers to Crossword]

10/04/12 AT THE TABLE Bruce Venzke, edited by Stanley Newman

Across

- 1 Gallic word of gratitude
- 6 "Ornery" guy
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| S | I | L | O | S | | F | D | I | C | | F | L | A | G |
| S | C | E | N | T | | F | O | R | K | | L | I | F | T |
| | | | S | A | V | E | | | | S | O | R | E | S |
| M | A | C | K | T | H | E | K | N | I | F | E | | | |
| R | E | L | I | E | S | | A | U | N | T | | A | S | K |
| I | R | A | N | | | A | R | T | | | F | I | C | A |
| S | O | P | | | K | I | T | E | | | L | A | I | D |
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| B | R | E | T | | G | A | Z | E | | | O | M | E | G |
| C | A | S | A | | S | C | A | R | | | S | E | D | A |

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