

THE VULCAN LETTER

Voice of the UAB MSTP

MARCH 2016

Small Scientists at Large: Outreach at the Birmingham YMCA

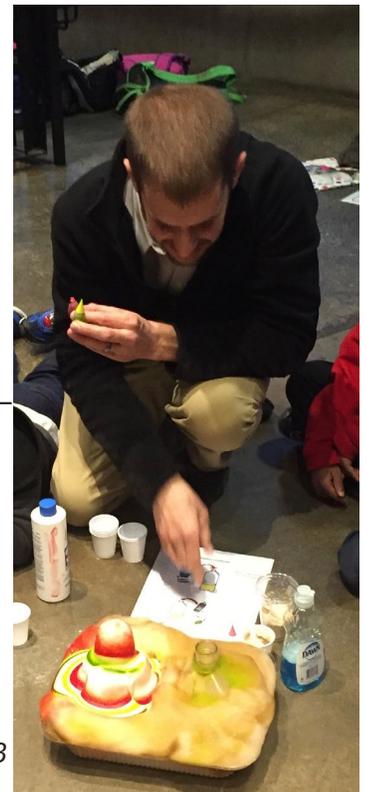
Hayden Pacl

A rare hush came over the crowd of K-8th graders, their eyes fixed on a conical flask containing a strange pink mixture of yeast, soap, and water. Our own Tyler McCaw (GS1)—master of ceremonies—built on the massive anticipation of the curious kids as he added the final reagent to the mix: hydrogen peroxide. Rising, rising, and VOOM! An eruption of pink foam shot from the top of the container, causing an eruption of disbelief and amazement from the local Birmingham students at the YMCA after school program. This experiment, fondly called “elephant toothpaste,” employs catalase-positive yeast to break down hydrogen peroxide, producing a gas that is then captured in the soapy water to produce bubbles that come rocketing out of the top of an open container.

This experiment was center stage this January, when a group of students from the UAB Chapter of the American Physician Scientists Association (APSA) went on their monthly visit to the Birmingham YMCA (the Y). APSA has founded a new partnership with the Y this year, conducting monthly interactive

science demos to engage young students in scientific thinking and experimentation. Volunteer instructors are pooled from the graduate school, medical school, or both (i.e. MSTP students) regardless of APSA affiliation. During each visit, the group goes through a demonstration—like the “elephant toothpaste” experiment described above—followed by replication of the experiment in small groups. In the smaller sessions, the UAB volunteers get to introduce scientific

cont. on pg. 3



Brandon Fox (GS1) making elephant toothpaste

Dr. Mukesh Jain Visits UAB

Paige Souder



Tyler McCaw and Mark Pepin (both GS1) posing for a selfie with Dr. Jain

This February, we had the pleasure of hosting Dr. Mukesh Jain, the founding Director of the Case Cardiovascular Research Institute, Chief Research Officer for the Harrington Heart & Vascular Institute, and Vice-Dean for Medical Sciences (among other titles) at Case Western Reserve University/Case Medical Center. Dr. Jain graciously offered his time to talk to students and faculty about his path to success as a physician-scientist and gave out numerous pearls of wisdom along the way. Two UAB members of APSA (see above article), Travis Hull and Brandon Fox, worked with Dr. Jain previously to put together an online interactive session through National APSA. When APSA was considering speakers to invite for a keynote address through a grant they -cont. on pg.5

Downtown Revitalization

Paige Souder



While Alabama may be famous for its football legacy and widespread availability of fried foods, Birmingham is quickly morphing into a cultural pocket in the middle of the southeast. Currently, Birmingham city is throwing \$800 million into a downtown revitalization that is catching the eye of young professionals and shifting them out of the suburbs and back into the metro. Birmingham Business Journal has a full list of the 30 projects being funded in this endeavor; here are the high points and a few other notable improvements from an insider's perspective.

1. The Ballpark

In 2010, Railroad park opened in a few blocks north of UAB to brighten up a previously widely unused slab of concrete. Three years later in April 2013, the Birmingham Barons (MiLB AA White Sox affiliate circa 1988) baseball team opened their season in the new Regions stadium right across from the park. The area keeps on booming, boasting Good People Brewing Co. and a new living community (Liv Parkside) within walking distance of both. Opening soon is an additional apartment complex (Venue at the Ballpark) on the other side of the fields.

2. The Pizitz

Coming in 2016 to the north side is a renovation of the historic Pizitz department store building. The upper levels will contain residential and office space, while the ground floor is further propelling the food culture that has exploded in Birmingham over the past few years to create a "Food Hall." Here you can find a quarterly rotation of up-and-coming chefs from the area and plenty of space to hang out and eat their incredible food.

3. 20 Midtown

Shopping is a pleasure, especially when fresh

fruits and vegetables, coffee, and burritos (sans bacteria) are mere blocks away from the UAB scene. The 20 Midtown complex opened a newly constructed Starbucks and Chipotle in the past few months and is scheduled to open a Publix later this year to anchor the development. More apartments (sure to be luxurious) going in upstairs.

4. The Lyric

♦The Lyric Theatre (formerly the Vaudeville theater) dates back to 1914 when it was THE place to go see a show in Birmingham. The space was renovated last year and opened across from the similarly-historic Alabama Theatre this Winter. Come for a magical night of performing arts and snazzy events like Masquerade Balls—flapper dress and bow-ties optional.

5. All things Avondale

♦The Avondale neighborhood of Birmingham, a 5-10 minute drive from the UAB hub, has blossomed over the last 5 years into the hippest suburb around. Get your space-themed coffee fix on at Satellite, then walk next door to the coinhabitant music venue, Saturn, to hear live music from a variety of artists. Don't forget to join them for video games and (free!) cereal brunch parties on the weekends. If coffee/music isn't your thing, go across the street to Avondale Brewery to grab a craft beer, or down the road to the newly opened Cahaba Brewery, or down another road to the quirky, but loveable TrimTab Brewery. Several restaurants have popped up in the area over the past few years (including Post Office Pies pizza and famously good BBQ from Saw's Soul Kitchen), with more on the way this year. Also look out for Box Row, an entrepreneurial development housed in old shipping containers -cont. on pg. 6

Tackling a Systematic Review

Anna Joy Rogers

Have you ever accidentally authored a paper? I have. Based on discussions with other graduate students who have stumbled into writing a systematic review, it would appear that I am not alone. Most of us start by reading hundreds of articles in preparation for our dissertation proposals. Now that we have spent a few months amassing a stack of papers that we have highlighted and underlined, we think – “Hey! I’m a mini-expert now. I want to have something to show for all the time I spent on researching. I guess I’ll write a systematic review as my first dissertation paper.” There’s nothing wrong with that. My mistake was that I launched into writing before I really understood what systematic review methodology entails. I had almost finished drafting a complete paper before discovering that if I wanted to have a decent chance of getting it published, I would have to start from scratch. Here’s how not to do what I did:

1. *Come up with a specific answerable question.* I know this seems like a no-brainer, but it’s actually quite important advice. Don’t start with a set of articles on a topic and then try to summarize it. Know the specific research question that your audience might be asking. For example, all they

may want to know is, “are cranberries useful for preventing urinary tract infections?” Don’t throw the kitchen sink at them by discussing a host of other homeopathic remedies as well just because you read them while doing exploratory dissertation research.

2. *Make a librarian your best friend.* On my first attempt at a systematic review, I defined my own search terms and plugged them into PubMed. While I came up with a good set of articles, I missed out on two articles with evidence that radically impacted the conclusions of my review. Librarians are trained to search the breadth of literature (including databases like Embase, Scopus, etc.) using alternate search terms. For example, in my research comparing vaginal deliveries to cesarean deliveries, it did not occur to me to include the terms “labour” and “caesarean,” which caused me to miss out on articles published in British English. Also note that you’ll have to publish your search algorithms because systematic reviews must be reproducible, just like any other scientific endeavor.

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Small Scientists at Large, continued

concepts to the young scientists, such as hypothesis formation (“what do you think will happen when we do this?”), experimental control (“let’s make sure everyone has the same amount!”), and independent variable manipulation (“what one thing do you want to change in you experiment?”). While sneakily learning the scientific process, the students get to see just how cool science can be!

As one of the volunteer instructors, I attempted to replicate and convey the concepts of the elephant toothpaste experiment to my group of five 2nd-4th grade students; they all wanted to help with the experiment, to smell each reagent, and to touch the final product for a true hands-on experience. With a lab partner, each student was able to carry out the experiment while manipulating one variable at a time, and then predict the final impact. All the while, I could clearly see the genuine, raw interest they had in the biochemical processes taking place in front of their eyes. “You’re so cool!” they kept saying as we watched foam spill over the top of the containers. What I understood, however, was science is so cool. By the end of the session, to confirm my suspicion, they were instead saying, “this [science experiment]

is so cool!” and I certainly believed them (and agreed). This trip in particular exemplifies the goal of our outreach program: to get kids exposed to and excited about science early, and to let them enjoy learning.

It is our hope as future physicians and scientists to make science “cool” and accessible to students that might otherwise be disinterested, discouraged, or disempowered. For the students that are none of these, we hope to further kindle their scientific interest into a full-fledged passion as they continue their education. As budding scientists ourselves, we feel that we are in an excellent position to do this work, helping to bridge the gap between classic scientific authority figures, such as professors and physicians, and secondary students just beginning to accumulate knowledge. This partnership between UAB APSA and the Birmingham Y is one way in which we are undertaking this mission. As we all know, the path to being a physician and/or scientist is a long one, but it is not without great reward. We hope to share the privilege of following this path with the genuinely curious and to encourage all (both big and small) to take an interest in science and learning.

Student Sketch: Avinash Honasoge

Paige Souder

The UAB MSTP Student Sketch series highlights current students and alumni who are accomplishing awesome things at UAB and beyond. Avinash Honasoge, a soon-to-be intern (aka MS4) who casually accepted a spot in Washington University's Ophthalmology Residency Program (eye and vision specialty medicine) is featured in this article. Read on for a glimpse through the lens of a graduating MSTP with a vitreous sense of humor.

Avinash grew up in the suburbs of Chicago, which he describes as the the cleanest, friendliest big city in the world. He then went to college in Chicago at Northwestern and came to Birmingham for the UAB MSTP. He has now been here long enough to consider Birmingham home and loves how easy the city is to live in and being able to recognize people on the street, especially at UAB (words of wisdom: don't make enemies). Avinash decided on the MD/PhD route with the ultimate goal of "bench to bedside" research. When the time came to apply to programs after undergrad, he knew he would enjoy both medicine and science, so he wanted to give both a shot and see what he could make out of it (he's done quite well, so far). To him, one of the great draws of an MSTP program is that your doors are wide open, allowing you to make your career anything you want it to be once you're through training. He interviewed at several programs, and remembers being hesitant about UAB because of its location in a totally different region of the US than what he was accustomed to. His final decision came down to staying close to home or making the leap to Birmingham, and leap he did. He describes the move as a "seamless transition" both in terms of the program and the city. After completing his first two years of medical school, he joined Harry Sontheimer's lab studying glioblastoma and then made the transition back to clinics where he found

his love for ophthalmology. Following graduation from the program this May, he'll complete his residency at Washington University in St. Louis. Here are some of Avinash's responses from our interview:

Paige: How did you come about choosing Dr. Sontheimer's lab?

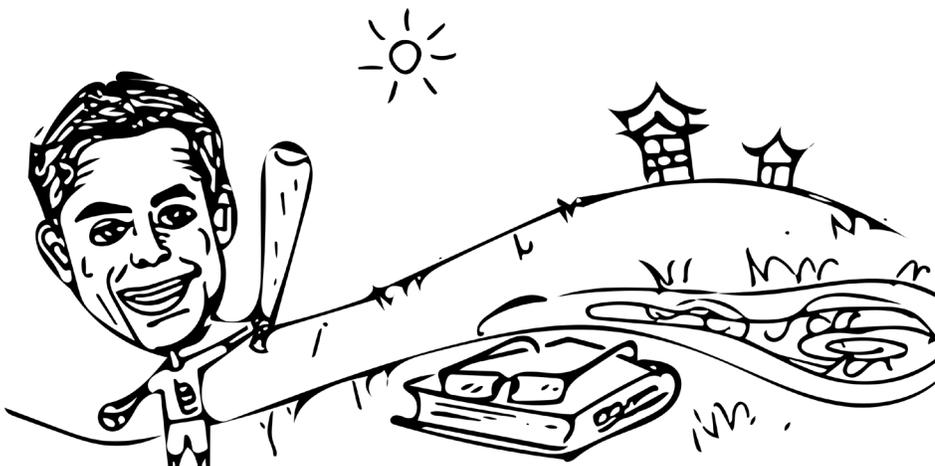
Avinash: He was the best mentor I rotated with, he was solidly entrenched at UAB, he was a good personality match for me, and his managerial style allowed my desired level of autonomy. He was hands-off, but always there if you had need. I think that's more important than the actual research project you have in the lab. You have to figure out how you can get the best mentorship and learn how to ask good questions. Whatever field you go into, you ask questions, learn your niche, and then learn techniques to help you answer those questions.

Paige: Can you give us an "elevator pitch" of your thesis project?

Avinash: Gliomas are solid tumors, which are acidic. Even with ample oxygen, tumor cells pump out protons, so you get non-physiologic pH levels significantly different from normal cells. I was investigating how this could affect glioma tumor cell biology, to see whether pH was having a deleterious effect, was helpful, or was only kind of hurtful. It turns out protons shut down tumor cell growth via pH-sensitive ion channels and the cells in the acidic center flee and set up shop outside, then unfurl the tumor into the rest of the brain (following the "go" end of the "go vs. grow" theory of cancer progression). We saw effects we totally didn't expect when we first started, and used lots of patch clamp electrophysiology with in vitro models that had much of the same physiology as in vivo models.

Paige: Very cool. So what would you say was your best experience/year of the MSTP?

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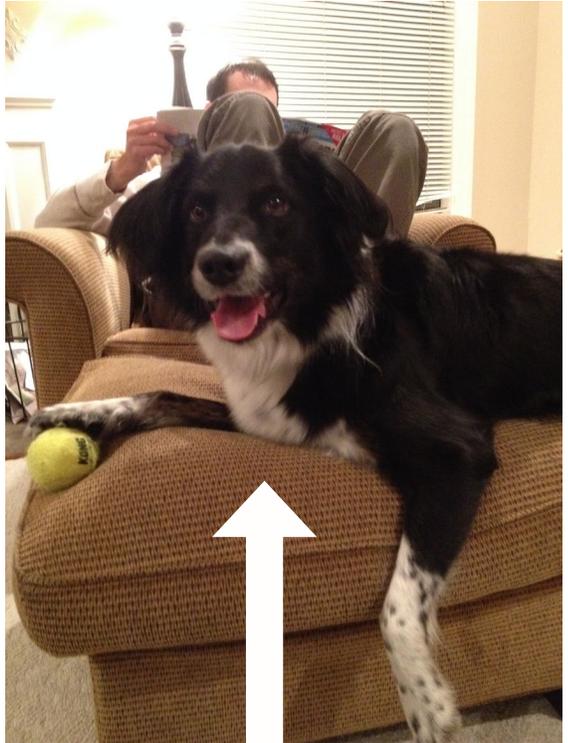


MSTP Pets, 2nd Edition

Proud pet parents, Tyler McCaw and Dr. William Geisler

Bella McCaw: The Retiree

This goober is Bella, a German Shorthaired Pointer (GSP) nearing 10 years old. She grew up on a farm in North Carolina roaming the woods with three other GSPs until she settled down to have six litters (with multiple baby-daddies!). Now in her Birmingham retirement home, she would tell you playing ball is still her most favorite thing, but she would be lying—it's napping on the couch. Her owner is Tyler McCaw, a GS1 who loves his dog Bella and displaying his athleticism.



Bohe Geisler: The Reconnoiter

Here's a photo of my 7-year-old mixed border collie "Bohe". He is high energy and very social. He enjoys long walks, playing with friends at the dog park, chasing a ball or frisbee, and hanging out with me. He is also a concerned citizen...when he hears sirens, he howls for all living things to hear and be alert. His owner is Dr. William Geisler, who loves Bohe and sunny days spent fishing.

Dr. Mukesh Jain Visit, continued

had been awarded through National APSA, Dr. Jain's was one of the first names suggested. Current UAB APSA President, Tyler McCaw, commented on his willingness and ability to come speak: "In retrospect, we were very fortunate that Dr. Jain was not only able, but very interested in visiting UAB. We later learned that he actually petitioned on our behalf to add another trip to his already overbooked schedule."

Dr. Jain's dedication to students was apparent in his meetings with students at UAB. He held an informal Q&A with APSA members during his visit, welcoming any and all questions and gave thorough answers that were honest and targeted to our level in training. When asked about selecting students to train, he referred to one of his current students "as a son," boasting of his tireless work ethic and curiosity like a proud father. He emphasized the importance of passion in your work, describing how his passion for science developed out of one successful experiment that posed a cool question. Tyler stated

that his main take-away from Dr. Jain's visit was the importance of relationships, both professional and personal. "The importance of good mentorship and its ability to position you for future successes was a recurring focus. [He] recounted numerous instances in which his mentors had made a clear impact on his career path. Both Dr. Jain and a former mentor also testify to the notion that a person's spouse will determine his/her ultimate career trajectory."

Dr. Jain also spoke on his research, beginning with a broad approach to metabolism and immunity and searching for a unique, unstudied gap in knowledge that ultimately came to him via dissecting the role of KLF2, a transcription factor involved in switching metabolic states and aberrated in many diseases.

Throughout his visit, comical anecdotes were routinely interspersed with valuable lessons so naturally that he was able to captivate any audience. He is an excellent physician-scientist with a knack for story-telling that UAB will not soon forget.

Downtown, continued

with restaurants, retailers, and office space.

4. The Hill Center

- ◊ Opening a block down from the medical school building is the Hill Student Center, dubbed “the living room of UAB.” This newly constructed complex puts Panera Bread, Starbucks, and other dining options, as well as a bookstore and study/meeting spaces, well within reach of bustling students. Perfect both for getting work done and taking a break to watch the game on TV.

Student Sketch, continued

Avinash: The 2nd year of medical school was my favorite [my jaw drops]. It was the time where everything you’ve learned gets synthesized. I had never felt like a doctor, but then I could answer questions about all of the organ system issues. Studying for Step 1, I really felt like I might be able to pull this [career in medicine] off for the first time.

Paige: That’s definitely a very encouraging view for MS1-2s prepping for Step 1.

Avinash: Studying for Step 1 really was my favorite thing. I also really liked the MSTP retreats we had in Columbiana at the 4H center. It was great bonding time, because it was in the middle of nowhere, so it was just us there and we had a lot of fun. Medical students don’t get as much of that community.

Paige: The community within the UAB MSTP is definitely awesome. Do you have any more comments on that?

Avinash: Your classmates in the MSTP, especially after the medical students you started the program with leave, and the program administration become your closest family in Birmingham, so it’s nice that ours is so tight knit. It’s a cool experience to watch classmates get married and watch everyone evolve. People in my year now are so different than they were when they started. I don’t know of any other program that has something like that.

Paige: It’s special, for sure. Looking back from where you are now at the end of your training, are you happy you chose UAB MSTP?

Avinash: Absolutely, it’s hard to beat UAB MSTP. Given an option of doing UAB MSTP versus any other nationally renowned program across the country, I would choose UAB. First, Robin is amazing. Second, it’s a powerful program that cuts a lot of extraneous stuff that [at other programs] increases the time to graduation. Here, you’re almost certainly going to be out in 7-9 years. Even from what I’ve heard from friends in other MSTP programs, ours is incredible. UAB and Birmingham have both been really good to

The Lyric Theatre



me, and I’m definitely going to miss being here.

Paige: Well said. We’ll miss you, too! Speaking of that, how did you decide on ophthalmology for residency?

Avinash: Shooting lasers at people’s faces is really neat. And, it’s one of those specialties that is underrepresented among MD/PhDs, providing more opportunity for translational research and the chance to ask interesting questions because there’s a need for that. I also really like the way ophthalmology is structured—clinical and surgical—and that everything is in such small packets. You may see 30 patients in a clinic morning or do 5-10 cataract surgeries, compared to seeing 4 patients in an afternoon neurology clinic or one 12-hour long abdominal surgery. It allows you to have a fruitful clinical side along with lab/research/whatever else you want to do.

Paige: It is hard to beat shooting lasers for a living. What are you most excited about going into residency?

Avinash: There are so many things. I’m excited for a new city and the chance to see something different, and to actually be the “end person” on the team—putting in orders, making the clinical decisions, trying my hand at the surgeries, etcetera. I’m also excited to be a cog in a the well-functioning machine that is the hospital. As a medical student you’re kind of extraneous, but now I get to be a vital, important part of the team.

Paige: So awesome. Definitely something for younger students in the program and aspiring applicants to look forward to. Do you have any big plans before starting residency?

Avinash: I’m actually going on a self-guided tour of Japan with my brother and parents soon, and a trip to the Caribbean. So I’m pretty excited about those. Other than that, I’d like to learn the basics of cooking so I can whip stuff up during residency and figure out what goes well together.

I'm with Stupid

Hayden Pacl

When I received my acceptance to the UAB MSTP, I was overcome by a flood of emotions. I was proud, relieved, excited, and nervous, to name a few. I also distinctly remember feeling validated in being told that I was good enough—that I was smart enough. To enter into one of the most academically rigorous training programs, at one of the best schools in the country, by a committee of world class scientists was something I had always hoped for (but never banked on). I certainly reveled in this feeling, but it was not to last...

It was mid-June when I started my summer rotation, conducting experiments applying immunohistochemistry techniques to tissue samples taken from genetically-manipulated mouse models of Alzheimer's disease. Sounds kind of "smart," eh? I sure thought so—that is, until I began trying to work independently in a brand new lab with a brand new technique. I didn't know where anything was, I regularly had to get help with parts of the new protocol, and the general lab culture was a mystery to me. It was even worse when I began teasing apart the pieces of my project.

Given two pieces of information (yellow boxes in figure 1, below), I quickly found I had many more questions than answers (green boxes in figure 1). Each day, in addition to needing help for the simple tasks like making a buffer, I was constantly confronted by questions I simply didn't know the answer to yet. While I regard my first rotation as very successful and enjoyable, I will say that I often felt stupid. I realized, however, that the operational word

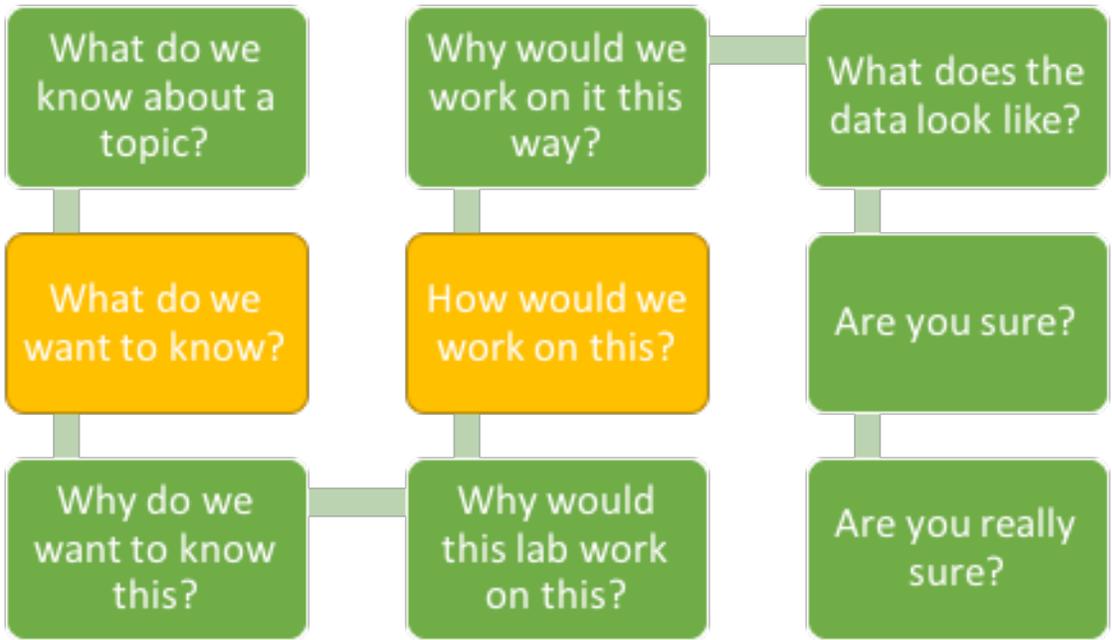
in the statement "I feel stupid" is not stupid, but feel. I began to regard my stupidity as an emotion and state of mind, not unlike being happy or embarrassed, rather than a defining characteristic.

Life Lesson #1: If you go into a career in science, you are going to feel stupid—here, there, or anywhere. Fundamental to the scientific process is confronting questions you will not know the answer to. The field is simply too large and ever growing. To contribute original work to a body of research, you are trying to answer something that no one has ever answered before, so of course you don't know the answer! While the course of research may make you feel stupid at times, it is inherent and important to the process. Embrace it, rejoice in it, and keep going. It is a road sign that lets you know where to go.

After I had this realization, my rotation was over and I was starting medical school. Because I was getting back into my wheelhouse of textbook knowledge, I naively thought I wouldn't feel stupid for a while. After all, the well-trodden fields of knowledge seem much less treacherous than the boundless unknown you forge through during research. This may be true, but it is remarkably less true when you are running full tilt across those fields of knowledge. Shortly after starting, I tripped and felt stupid again, and again I learned something else about feeling stupid.

Life Lesson #2: If you are constantly learning (i.e. a career in medicine), you will have moments when you feel stupid. This is especially true during the educational process. *cont. on pg. 8*

Figure 1. Looks a lot like the scientific method, right? In this aside, I will also mention that I began to truly understand the organic derivation of the scientific method during my first rotation. My mentor gave me a project (yellow box 1) and a protocol (yellow box 2), but pushed me hard to be able to answer each question in this sequence. Each time he asked me a question, I got better at answering, so don't be alarmed to have a few gaps in your knowledge! Starting anything new is a trial.



Systematic Review, continued

- 1. Read systematic review guidelines.** In order to ensure reliability, systematic reviews follow specific recipes. Journals now expect you to follow these guidelines pretty strictly, often requiring that you submit a checklist of items that you have included in your paper. PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) and MOOSE (Meta-analysis of Observational Studies in Epidemiology) are the most commonly used guidelines. Another major resource is the handbook produced by the Cochrane Collaboration, a group recognized as producing the highest standard of evidence-based research summaries.
- 2. Pre-define your inclusion and exclusion criteria.** Your systematic review should follow a pre-defined protocol, preferably one published beforehand either in a registry such as PROSPERO (an international prospective register of systematic reviews) or in a journal like Systematic Reviews. You'll need to have a flow chart explaining why you ended up with the articles that you base your study on and this should include reasons for why you rejected articles at each stage (for example title review, abstract review, and full text review).
- 3. Come up with a data abstraction form.** Know in advance what tables you plan on having in your paper and thus what variables you want to abstract from all the papers. Trust me—this will save you loads of time if you do it up front, rather than reading through all the papers over and over again to find what you need.
- 4. Appraise study quality.** No systematic review is complete without some appraisal of the quality of studies included in the paper. This allows readers to weigh the relative merits of the individual studies, as well as your overall conclusions.
- 5. Read other systematic reviews.** Let's face it, most of us never have taken a class on systematic review methodology, and probably never will. It is also unlikely that we have a mentor who is trained in this type of study design. We need to use other published reviews, preferably those conducted by the Cochrane Collaboration, as our textbooks.

Although systematic reviews are a lot of work, they can be an incredible learning experience. If your paper answers an important question in a rigorous manner, it also has a good chance of publication and citation. After botching up my first attempt at a systematic review and learning all the above pointers through the school of hard knocks, I'm proud to say that I have just submitted my manuscript to a journal. Cross your fingers for me!



I'm with Stupid, continued

Even if you know everything that you are taught in a lecture (a pretty big if), there are other pieces of information sitting just under the surface that you skip across. You will have to confront these gaps in your knowledge in the simulation lab, clinic, and exams. In this case, the feeling can serve as a flag to alert you of your weak points (which are present in everyone) and subsequently provide you with the best learning opportunities. That is why we are here, after all!

So if you are becoming a physician-scientist, (you can probably do the math) you might feel doubly stupid—and I'm not saying you shouldn't feel stupid. My point is that you should recognize this feeling as an integral part of the scientific process and as a step in learning. It is the barrier between you and genuine knowledge that you can valiantly break down—an essential and exciting feat. While I haven't said it yet, I also recommend that you feel smart

every now and then. The reason I felt validated when I was first accepted to this incredible program is no less true now than it was then. If anything, I am learning more each day. The major difference, however, is that I face my astounding ignorance every day; instead of feeling bad about it, I must say that I feel stupidly excited!

Important Acknowledgement: While I had the delightful experience of learning these lessons on my own, I read a very influential article that spurred me on to share and helped me verbalize the ideas I presented above. I strongly recommend reading the following article:

Schwartz, M. A. (2011). The Importance of Stupidity in Scientific Research. *Seismological Research Letters*, 82(1), 3-4.

I hope you find that I have expanded on these ideas, as well!

Awards

♦Jarrod Meadows' (MS3) research paper, "DNA methylation regulates neuronal glutamatergic synaptic scaling," recently made the Discover Magazine's top 100 stories of the year. Congratulations!

New Additions



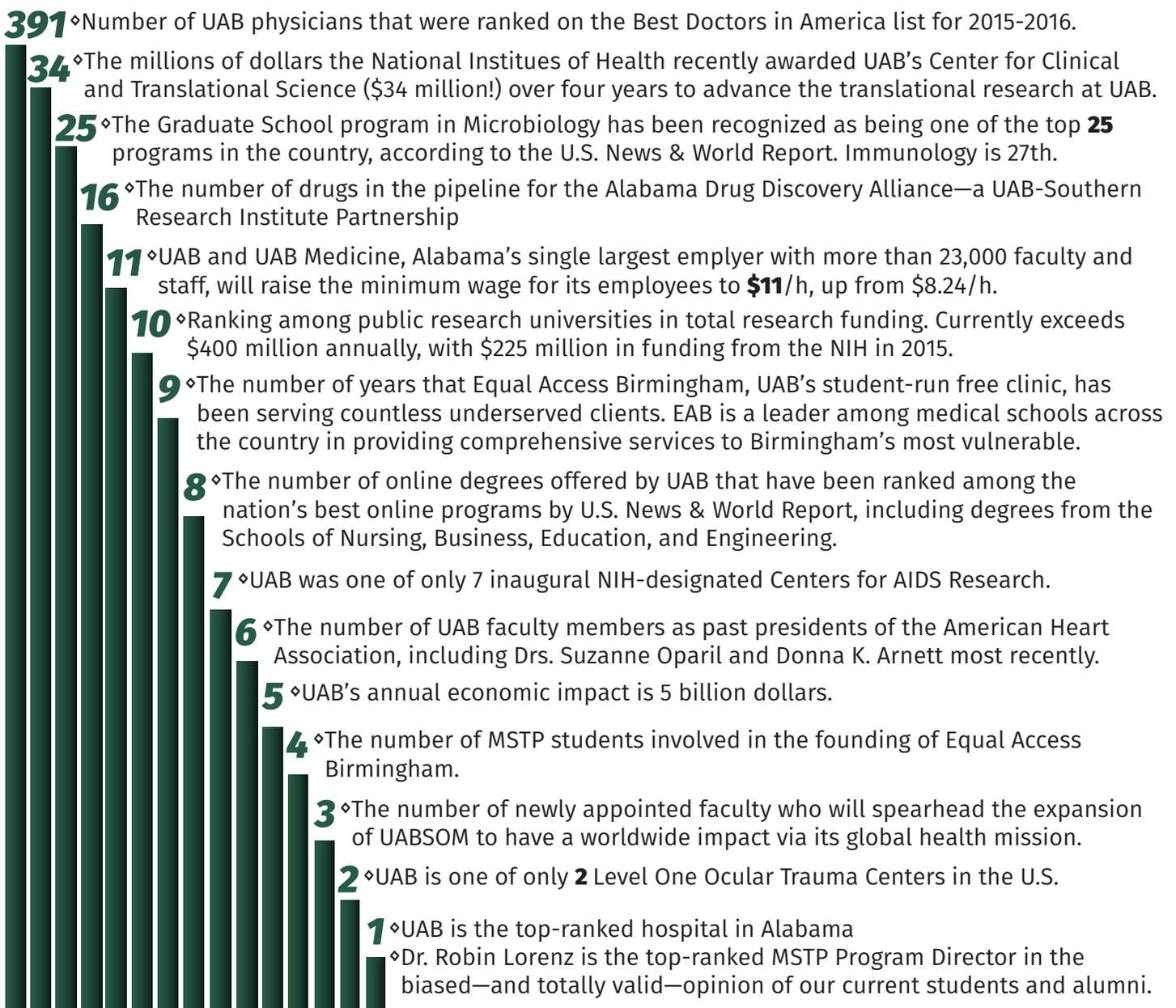
Adelaide Anne Coty (both pictures), daughter of Jennifer Stanley (MS3)

Dissertations

♦Carson Moseley (Immunology Theme) will defend his thesis March 23—wish him luck!

MSTP Insider: UAB Rankings

Anna Joy Rogers



Publications

- ◊ Krzywanski DM, Moellering DR, Westbrook DG, Dunham-Snary KJ, Brown J, **Bray AW**, Feeley KP, Sammy MJ, Smith MR, Schurr TG, Vita JA, Ambalavanan N, Calhoun D, Dell'Italia L, Ballinger SW. Endothelial Cell Bioenergetics and Mitochondrial DNA Damage Differ in Humans Having African or West Eurasian Maternal Ancestry. *Circ Cardiovasc Genet*. 2016 Feb;9(1):26-36. doi: 10.1161/CIRCGENETICS.115.001308. Epub 2016 Jan 19. PMID: 26787433. PMCID: PMC4758889.
- ◊ Kraguljac NV, White DM, Hadley N, **Hadley JA**, Ver Hoef L, Davis E, Lahti AC. Aberrant Hippocampal Connectivity in Unmedicated Patients With Schizophrenia and Effects of Antipsychotic Medication: A Longitudinal Resting State Functional MRI Study. *Schizophr Bull*. 2016 Feb 12. pii: sbv228. [Epub ahead of print]. PMID: 26873890.
- ◊ Rangarajan S, **Locy ML**, Luckhardt TR, Thannickal VJ. Targeted Therapy for Idiopathic Pulmonary Fibrosis: Where To Now? *Drugs*. 2016 Mar;76(3):291-300. doi: 10.1007/s40265-015-0523-6. PMID: 26729185.
- ◊ Kurundkar AR, Kurundkar D, Rangarajan S, **Locy ML**, Zhou Y, Liu RM, Zmijewski J, Thannickal VJ. The matricellular protein CCN1 enhances TGF- β 1/SMAD3-dependent profibrotic signaling in fibroblasts and contributes to fibrogenic responses to lung injury. *FASEB J*. 2016 Feb 16. pii: fj.201500173. [Epub ahead of print]. PMID: 26884454.
- ◊ Nakahara H, Herrin BR, **Alder MN**, Catera R, Yan XJ, Chiorazzi N, Cooper MD. Chronic lymphocytic leukemia monitoring with a Lamprey idiotope-specific antibody. *Cancer Immunol Res*. 2013 Oct;1(4):223-8. doi: 10.1158/2326-6066.CIR-13-0052. PMID: 24432304. PMCID: PMC3888878.
- ◊ Glover ME, Pugh PC, Jackson NL, **Cohen JL**, Fant AD, Akil H, Clinton SM. Early-life exposure to the SSRI paroxetine exacerbates depression-like behavior in anxiety/depression-prone rats. *Neuroscience*. 2015 Jan 22;284:775-97. doi: 10.1016/j.neuroscience.2014.10.044. Epub 2014 Nov 4. PMID: 25451292. PMCID: PMC4267992.
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