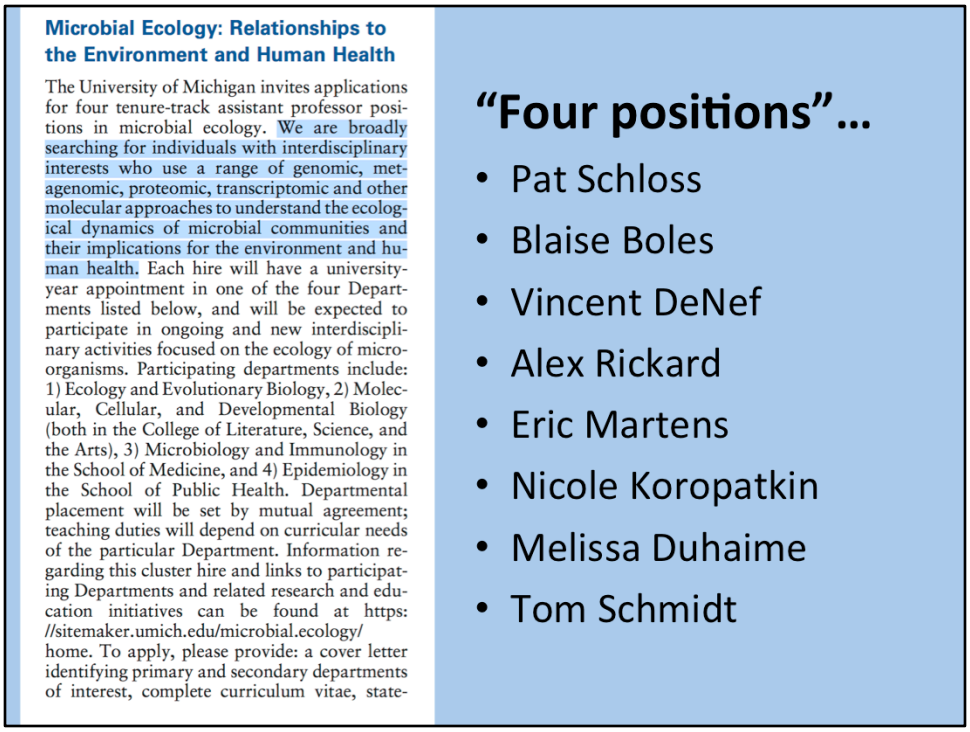
The Frederick G. Novy Collegiate Professorship in Microbiome Research

Patrick D. Schloss

Thank you for that wonderful and obnoxious introduction. I also thank each of you here today for coming to celebrate, what I think was, at the time it was approved by the Regents in December, the first endowed chair in microbiome research anywhere. Regardless, it is a great honor to be given this recognition. The truth is that there are a significant number of faculty in the medical school who are as deserving or more of this recognition including my friends and colleagues Vince Young, Tom Schmidt, John LiPuma, Gary Huffnagle, to name just a few. I am proud to be part of a team of scientists that has embraced microbiome research both within the medical school and across campus.



I think I first met Vince in early 2005 while I was interviewing at Michigan State. I recall him talking to me at a reception at Tom Schmidt's house and he came up to me like we had always known each other. Since then, I've gotten the feeling that this is how Vince greets everyone, he's just that kind of guy. I recall calling Vince in the fall of 2008 telling him that I saw an ad in ASM's Microbe Magazine and asked if he could tell me more about the position. I don't know if the ad was written for me, but it sure sounded like it. Needless to say, Vince has gone on to be a wonderful mentor to me throughout the past 7 years and has actively sought ways to include me in projects and highlight my strengths. I dare say that there would be very little human microbiome research on campus were it not for the influence of Vince. Thank you for everything, Vince.

I am grateful to the leadership on campus including Harry's for literally doubling down on microbial ecology and basic research in the midst of a cataclysmic economic moment in US and more specifically, Michigan history. The original cluster hire that I was hired on sought to hire four individuals - by my count, that initiative was the catalyst that brought eight awesome scientists to campus. I feel truly blessed to be a professor at the University of Michigan.

You have heard plenty from my amazing trainees about the microbiome and I gave a talk last month on campus at the Michigan Meeting. So, you don't need me to pull out the same stale slides of microbiome data and repeat my lame dad jokes.

In fact, when I showed this talk to my wife, Sarah, and asked if I should just talk about the microbiome her response was "please don't, no one cares". Having been at Michigan now for nearly seven years I sometimes fear that people don't really know me. You know my students, postdocs, staff, and their research. You hear the obnoxious things in that introduction.

People know me as the guy with the farm.

We had to bring out the smelling salts when you learned we were expecting our fifth child.

Then I told you we're expecting number 6

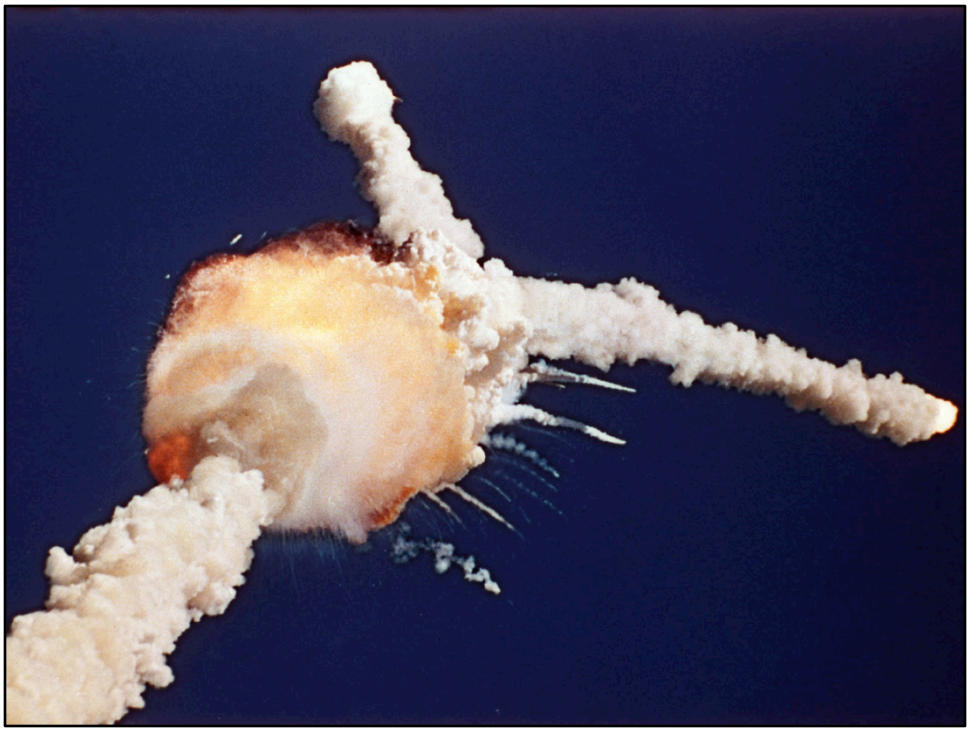
7

8

I'd like to think this is a superficial take of who I am, but it mostly nails it. Any recognition I receive I share with the trainees and staff who work with me, my collaborators, but mostly my wife, Sarah. The truth of it is that Sarah is the smart one in the family. I should be the trailing spouse, not her. Sarah runs a one room school, manages a farm, is always willing to cook a meal for a friend who's family has had a difficulty, and does it all with a smile. She looked over the menu for the reception that will follow and noticed that there was no cake. Not to be outdone in hospitality, she supported a friend's new bakery by ordering a cake that my kids are really hoping you don't touch. Sarah is my best friend and probably the only friend that hasn't totally annoyed me or me them over the past 20 years.

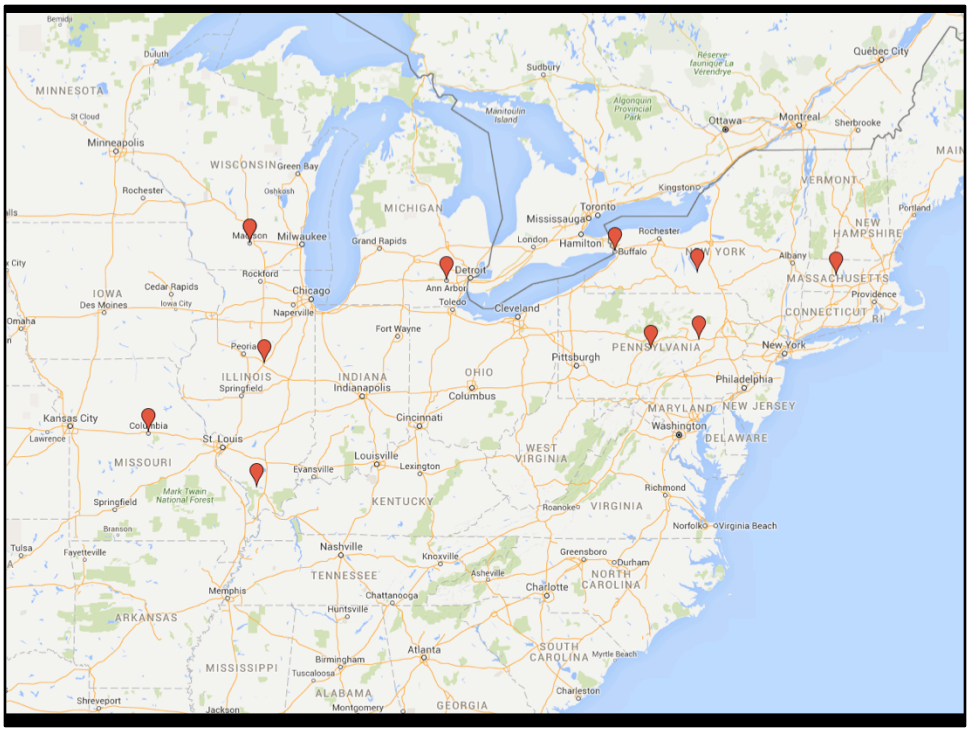
I'm not sure she appreciates this, but as Joe, Alyx, and Niel have each defended their theses and acknowledged various people, they have all included Sarah for her example, patience, and perhaps a little - for calming me down.

I hope that it isn't a surprise to you that nothing is more important to me than my family. I recently heard that faculty recruitment and retention is "all about the spouse". I believe that and you should either celebrate or recoil at the thought that Sarah can't imagine ever leaving Michigan. You're stuck with me.



As a kid I was fascinated by science. Like many of my generation, I remember exactly where I was the day the Challenger space shuttle exploded - huddled around a TV with my classmates at Radio Park Elementary School in State College, Pennsylvania. This only increased my interest in being an astronaut, eventually going to space camp three times, funded by making and selling wood cutting boards and bird houses.

I still remember lying awake at night during the State College Arts Fair listening to my dad working in the shop creating more inventory because we had sold out on the first day.



Like many of you, my parents provided the means and example to foster my love of science. Both of my parents were academics, making me something of an "academic brat" who moved from university town to university town as they moved up through the ranks - I still have no idea what "real" people do for jobs if they aren't at a university. By junior high we settled into Columbia, Missouri.

It was there that I started to realize what my parents did. Both of my parents worked with disabled individuals. My dad worked with graduate students to create and operate group homes for teenagers who were mentally disabled and had behavioral disorders. Many of these kids had the compounded difficulty of being physically or sexually abused by their own parents. His goal was to take these kids out of state institutions and help them to live in society. As a professor myself who is blessed with amazing staff, I can't imagine the courage that my dad possessed that this would work. Ultimately, he believed that the science that his work was based on would improve the lives of these young adults.

My mom also dedicated her life to the idea that people with cognitive, sensory, or physical disabilities should not live in institutions or work in sheltered workshops. Rather, she worked with employers to train these people to hold real jobs. My mom died 13 years ago of colon cancer, almost two years after Mary was born and right before Patrick was born.

The next year we would learn that Patrick was profoundly deaf - he could only feel sounds, not hear them. Were he born 10 or even 5 years earlier, Patrick's educational opportunities would have been limited to state schools for the deaf. I honestly feel that it was due to her efforts and those like her working with scientists and physicians that Patrick was able to receive bilateral cochlear implants at 15 months old. Today Patrick is definitely his father's son and the world is his oyster. I can only imagine my mom's reaction at what has become of him.

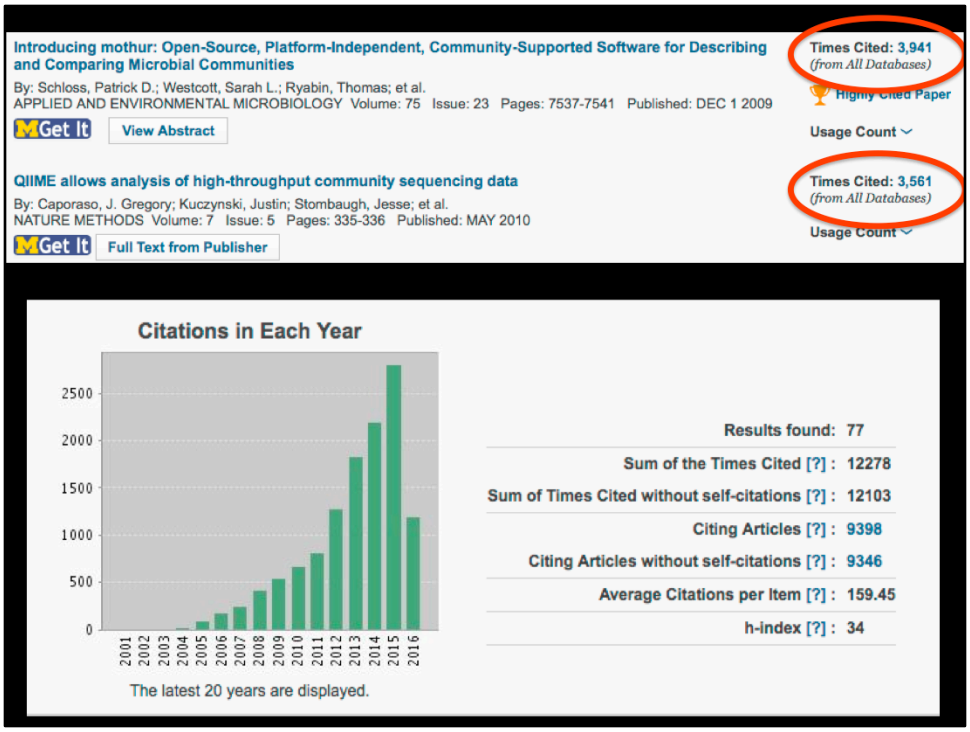
Growing up in Columbia was an amazing experience, where I was exposed to wonderful science and math teachers. In Mrs. Moore's 8th grade science class at Jefferson Junior High School, I had the opportunity to participate in my first real science fair. Around that time, I had developed a pretty decent addiction to golf.

For my science fair project I learned about the phenomenon of "learned helplessness". I took a golf ball, drilled a hole from one side to the center, filled it with lead, and painted over the hole. I then had my classmates putt at a putting machine 10 times. Half the participants had the weighted ball and half had a normal ball. Then I replaced the weighted ball and had them putt an additional 10 times. What do you think happened? Right, the people with the weighted ball did significantly worse with the true balls than the people that had the true balls all along.

The following year I asked how "true" golf balls were. Using a cup filled with an epsom salt saturated solution, I floated golf balls in the solution and repeatedly spun them to see whether the same dimple came to the top each time. Sure enough, for some balls there was an indication that the balls were not true. Then I took these balls and rolled them down a ramp to see what effect the bias had on how well the balls rolled.

As was mentioned in my introduction, I went on to earn degrees from Cornell University with Larry Walker, do a postdoc at the University of Wisconsin in the lab of Jo Handelsman, start my independent career at the University of Massachusetts, and wind up here today as a tenured associate professor with an endowed chair where I will finish my career.

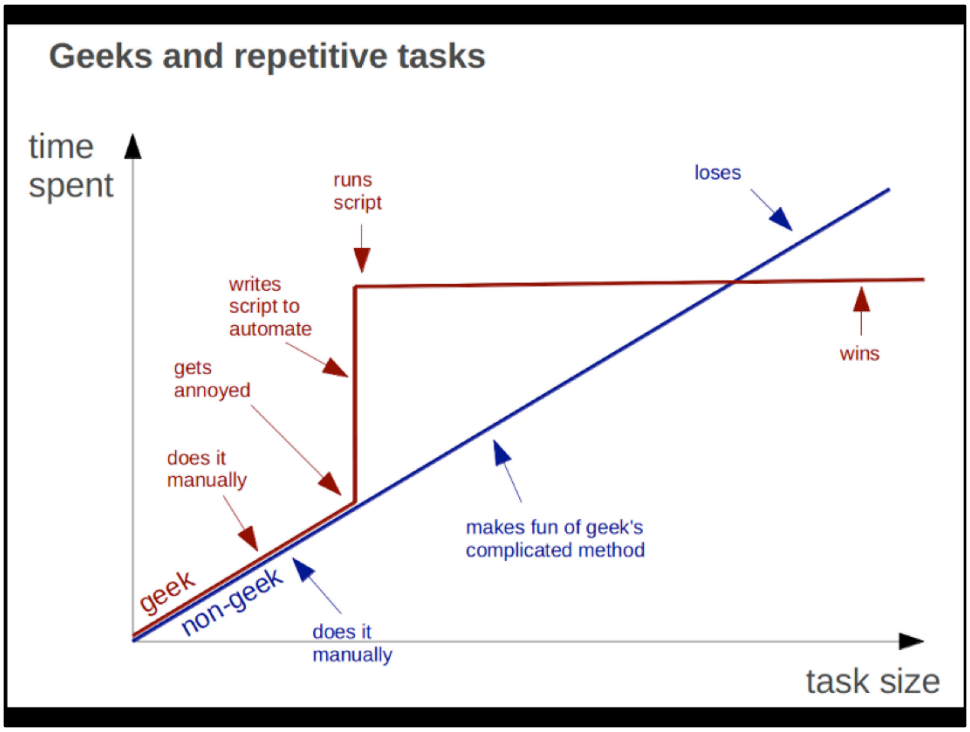
That all sounds very nice, but the truth of it is that I've sucked every step of the way. I applied to 15 graduate schools and got into one. I applied for probably close to 50 faculty positions and got one offer. The grant that funded our most successful paper was submitted 7 or 8 times before it was funded. I have since been unable to keep funding for that project. Leading to my own version of learned helplessness that somehow I can have an initiative with close to 4000 citations that I can't keep funded. My first graduate student didn't work out. My second stayed at UMass when I moved to Michigan. I've had someone hurl F bombs at me and my work in a reply all where they didn't realize I was part of the "all". I've seen others belittle what we do because if it is done on a computer it must be easier than what they do at a laboratory bench or because it is a fishing trip and not "real" mechanism-driven science. I've been asked to come back for second interviews because people thought I made the work we do sound too easy and not rigorous in my research talk. Each of us can share similar and probably worse experiences. I can only imagine what my female colleagues, colleagues who are the first in their family to attend college, or those who are people of color have gone through.



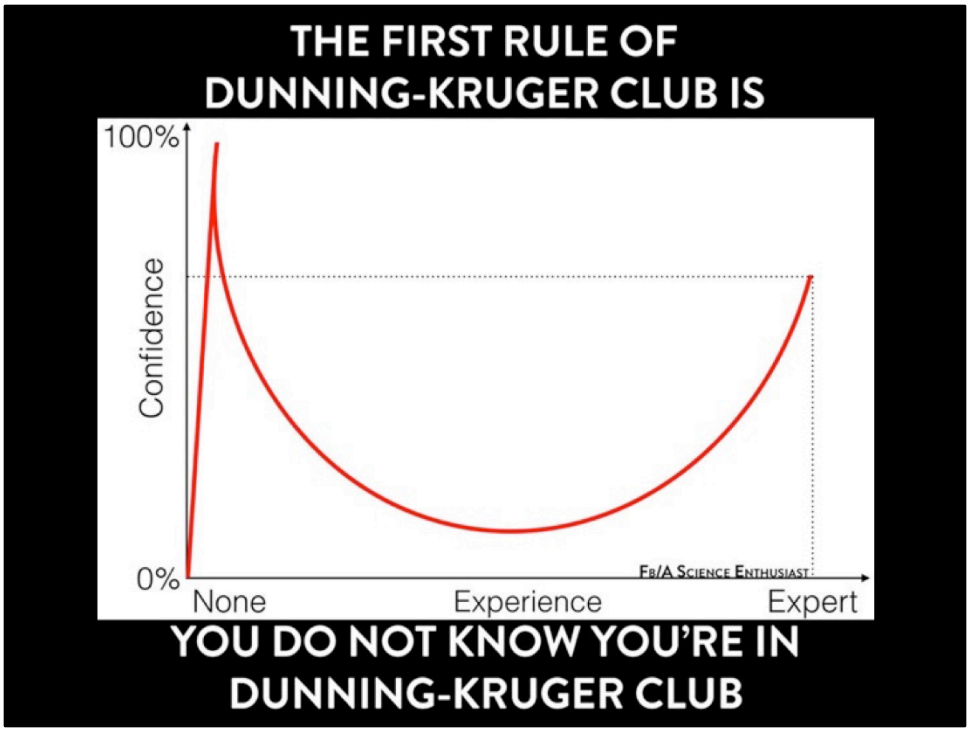
Why do we do this? Because we love science? Because it's RE-search and not search? I don't know. Sarah will tell you that I frequently think of quitting academics. Ultimately, I tell myself to get over it because I can't imagine letting down my trainees and I have a family to support. But more than that, deep down, I know my lab is really freaking awesome at what we do - we're the best.

In spite of all these failures we press on going deeper and deeper. I recently tried to count the number of things that I learned as a PhD student 15 years ago that I still use today. The list consists of ... writing, giving talks, and perhaps most importantly, thinking. Of course, as time progresses so does the technology, the tools, and the medium that we apply them to.

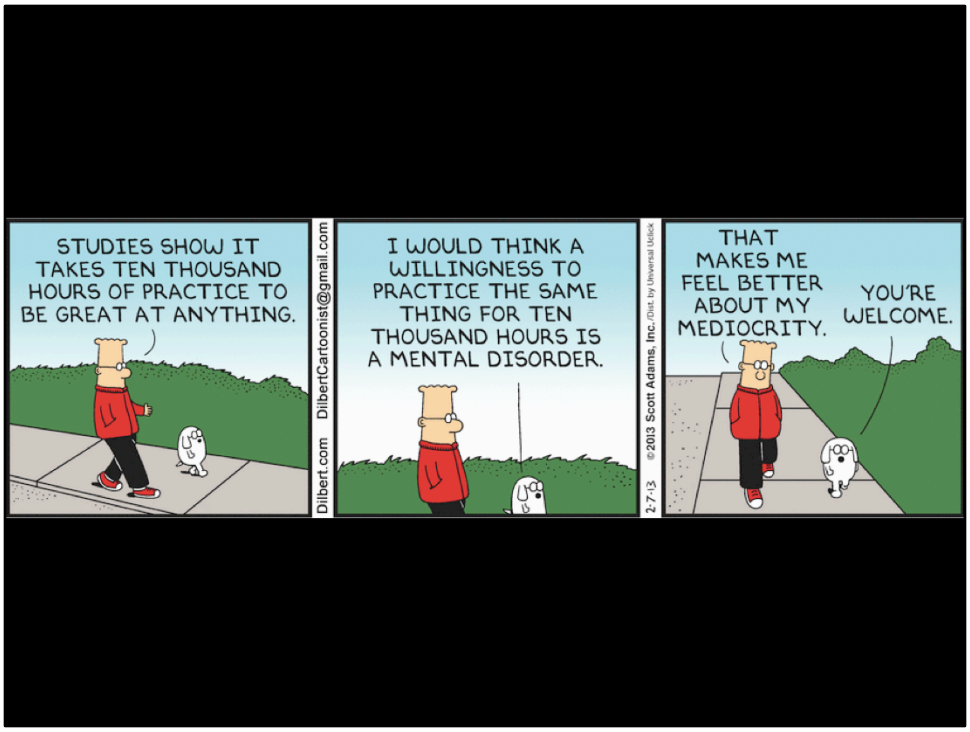
I love programming. I feel like Bob Ross when I use R to generate a figure - thinking of where to put a happy little legend or how to remove the always very sad looking pie chart. It's fun and it's something that I can do between filling out ICUCA protocols and trying to figure out how to tell the IBC how we know that bacteria are dead after being both bleached and autoclaved. Unlike a piece of wood, a script is perpetually malleable and I can come back years later and make it better. It reflects my progress as a scientist.



I am regularly asked what I suggest doing to learn how to write computer programs. It is a great honor for someone else to recognize a set of skills that I work hard to hone, but I honestly want to answer "the hell if I know." The honest truth is that I took a semester long class in a horrible programming language - Pascal - and promptly forgot most of it. Then I picked up other languages by looking at the horrendous code from others and modifying it to see what the code did. I would work chapter by chapter through a programming book and then write my own horrendous code. Over time, I like to think that it has gotten better.

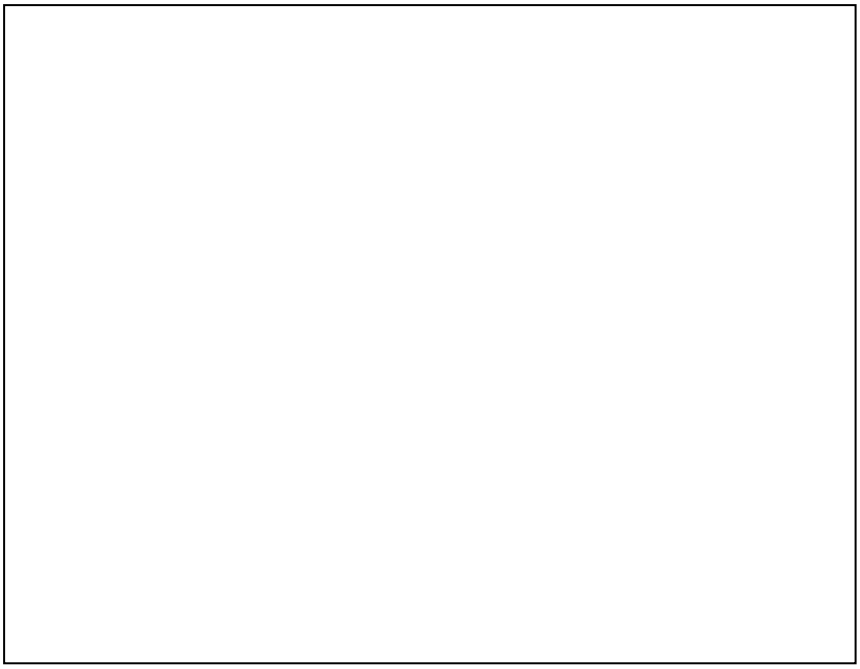


I hadn't found a succinct way to describe this until I got a call from a colleague at another institution who was really interested in strengthening his group's programming skills and perhaps converting some of their home grown code into a package for others to use. For the first time I answered honestly, "You're going to suck, but it will get better."



We live in a world where "sucking" isn't something we can own and be proud of. We either expect that we can be experts in 24 hours or we can never be experts because intelligence or expertise is a gift. Both of these ideas are insulting to people that have busted their asses to get better. I know that whenever I've wanted to pick up a skill, it's taken a lot of mistakes and repetition to get better at that skill. Similarly, when there's a new thing I have learned, but can't find the time to practice, I know I'm losing my skills. As some of you know too well, the 5 handicap I carried in high school would be a bit higher today because I only play golf once every couple of years. Learning new skills and technologies isn't just about reading every book on the subject or running a new analysis for a study. We need to practice those skills under the guide of a mentor or a community to get better. We need the support of a community that will help us go beyond the expertise of the community. We are then able to give back to that community to raise the community with ourselves. We need time and mentors to help us along. We need to seek review of our work to get an external assessment of how we're doing. Because we suck, until we don't.

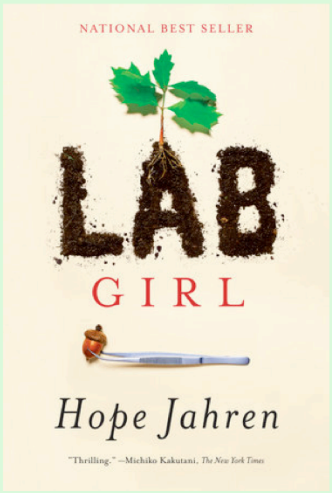
Considering I had nothing but encouragement growing up and have received more than my share of good breaks, I am constantly amazed by those who obviously didn't. They didn't have someone working all night restocking the inventory so that they could go to Space Camp. We all know these people - many are probably sitting here today - you are my own inspiration. People like my mom, who the night before she was to take the SAT was berated by her parents for thinking that she was only going to go to college to do my dad's laundry. I don't know her scores on that test, but I'm pretty sure they were horrible. Regardless, by going to college and eventually earning a PhD, she paved the way for her sisters, nieces, and granddaughters to go to college and of course converted her parents. Or, people like my PhD advisor, Larry Walker, who grew up in Detroit during the race riots, went to Michigan State for his degrees, and recently retired after a long and distinguished career at Cornell University. Or my 30-something friend that I worked with in Wisconsin who recently won the USDAs Early Career Award at the same time she fought off inflammatory breast cancer and continues to live with stage four breast cancer. I have had numerous students and staff work for me who have courageously battled depression, repercussions of sexual assault, and a variety of medical ailments. Others have shown great resolve in caring for their loved ones as they battle these circumstances. All of these individuals have or will go on to greatness - they will not break. But what about the student who couldn't finish my class because of crippling anxiety causing her to eventually leave grad school? What about the 8th grader in Flint who can't imagine a world in which



One of the "fringe benefits" that I came away with as a postdoc in Jo Handelsman's lab was an appreciation that there are myriad biases that we implicitly express. Resumes, identical except for the sex or race of the applicant are evaluated differently. Or the fact that as a man, I get a pass for talking about and showing pictures of my family in talks while female colleagues who do the same are seen as uncommitted. My family is obviously very important to me, but I show those pictures to normalize the balance between my work and my family. One inspires the other. We should not hold this against our female colleagues. Like the golf balls spinning in the salt solution, we don't have to be blatant bigots to make people feel helpless, it's the little pin pricks that add up and discourage groups of people from science. Research suggests that merely being aware of our biases can help considerably. Although that may help for things like reviewing applications and writing letters of recommendation, I feel like there's still more that can be done.

Tenure is actually some kind of a tool that might be particularly useful in your line of work. It is up to you to decide if you will shove this rare and transformative tool into a drawer and let it rust, or if you will pick it up and use it.

- Hope Jahren



https://hopejahrensurecanwrite.com

A year or so ago I read an article by Hope Jahren that was titled: [Ten Things to Do After You Get Tenure](https://hopejahrensurecanwrite.com/2013/12/30/ten-things-to-do-after-you-get-tenure/). There she dropped this thought provoking bombshell...

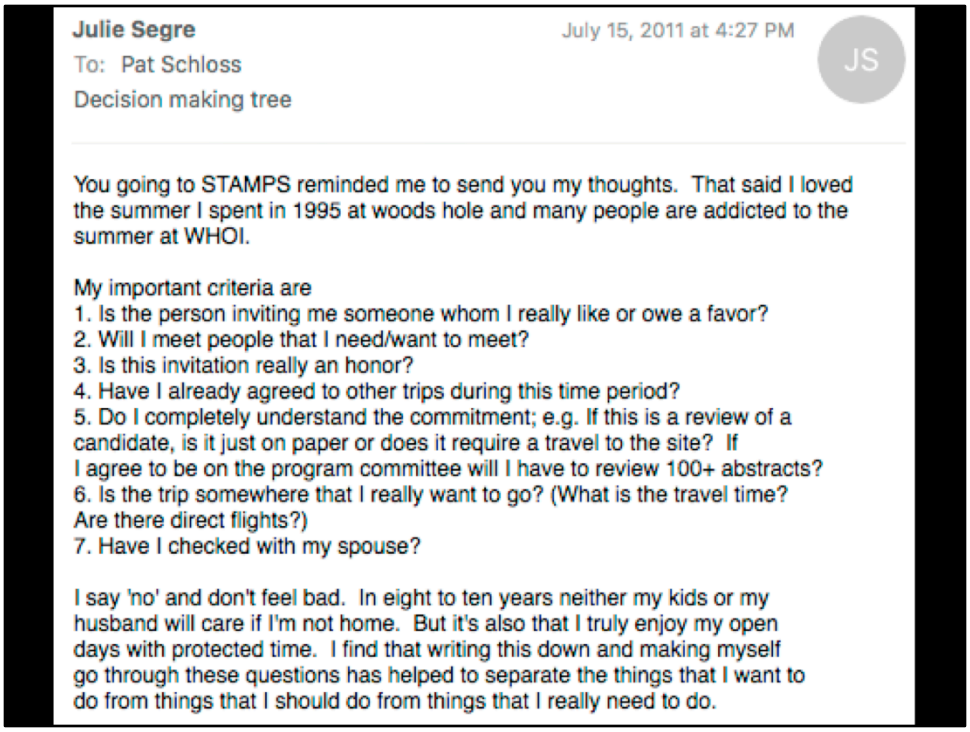
- Tenure is actually some kind of a tool that might be particularly useful in your line of work. It is up to you to decide if you will shove this rare and transformative tool into a drawer and let it rust, or if you will pick it up and use it.

Here I am now, several years in with tenure and with this new endowed chair. What am I going to do with this tool? What would you do with this tool? I really hope that when it's all said and done and I retire from the university that I will have had a meaningful impact on human health or that I will have helped to move science forward. I'm not convinced that this has or will happen. But what I have great confidence in is my ability to affect the people around me. To get them to see the world around them differently. To help them find a community where they belong.

For many of us in the room, there is nothing more exciting than microbiology. We see life, math, and even art through the lens of microbiology.

Others like my son, Joe, see it through the lens of his growing cattle, woodworking, and construction business.

Others, dinosaurs. Incidentally, crowd control isn't the hardest part of being a father of 8. Like running a lab with 8 people, it's figuring out how to see these differences in each individual to help them meet their potential. I have come to appreciate that what matters most to me in science isn't necessarily the microbes, but what we learn while studying the microbes. And so, in my own small way and while continuing to do the research that I have received this recognition for, I hope to focus on some very real contributions to help us overcome some of the things that deter our best and brightest young people from pursuing careers in science. As you've heard my story, you're hopefully aware that work-life balance and using my community to help further my training have supported me throughout my career.



Julie Segre July 15, 2011 at 4:27 PM

To: Pat Schloss

Decision making tree

JS

You going to STAMPS reminded me to send you my thoughts. That said I loved the summer I spent in 1995 at woods hole and many people are addicted to the summer at WHOI.

My important criteria are
1. Is the person inviting me someone whom I really like or owe a favor?
2. Will I meet people that I need/want to meet?
3. Is this invitation really an honor?
4. Have I already agreed to other trips during this time period?
5. Do I completely understand the commitment; e.g. If this is a review of a candidate, is it just on paper or does it require a travel to the site? If I agree to be on the program committee will I have to review 100+ abstracts?
6. Is the trip somewhere that I really want to go? (What is the travel time? Are there direct flights?)
7. Have I checked with my spouse?

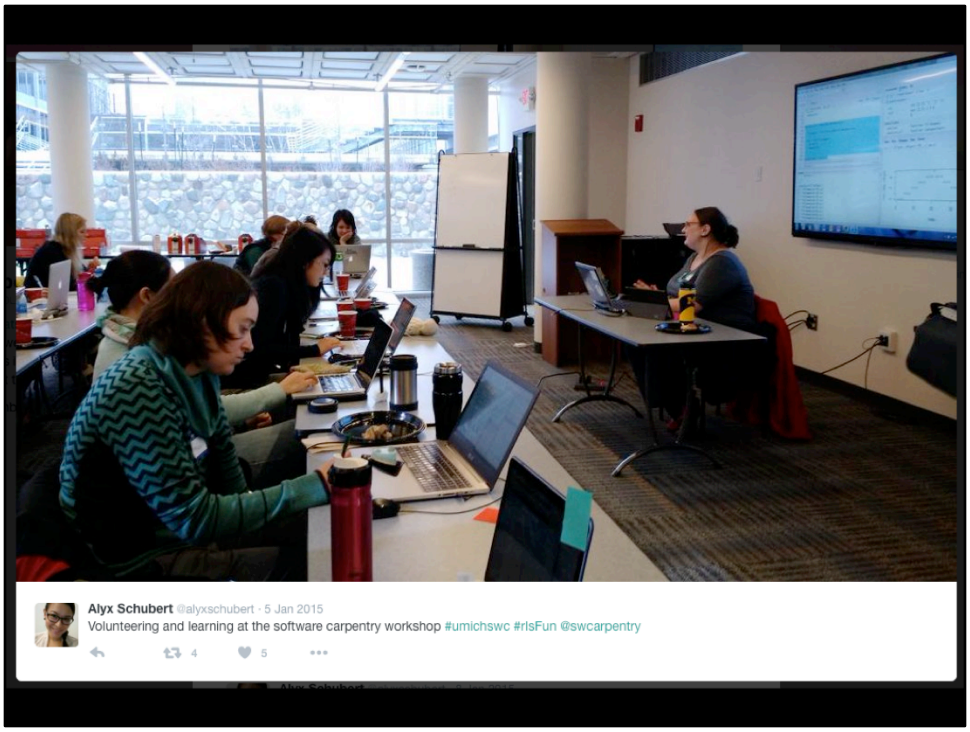
I say 'no' and don't feel bad. In eight to ten years neither my kids or my husband will care if I'm not home. But it's also that I truly enjoy my open days with protected time. I find that writing this down and making myself go through these questions has helped to separate the things that I want to do from things that I should do from things that I really need to do.

As a postdoc I accrued enough frequent flier miles to be automatically bumped into first class. It wasn't until the last couple of years that I have conscientiously turned down travel opportunities because they took me away from my family. Whenever I'm vascillating on whether to accept an invitation, I consult this email from the awesome Julie Segre, who I understand has sent similar emails to other junior faculty. It makes it very easy for me to say "NO" and not regret it. Of course, I can now afford, professionally, to turn down those opportunities. But what about the young parents, most likely women, who miss out on opportunities to present their science and network because of child care issues or the simple fact that they prefer their kids to their colleagues?!

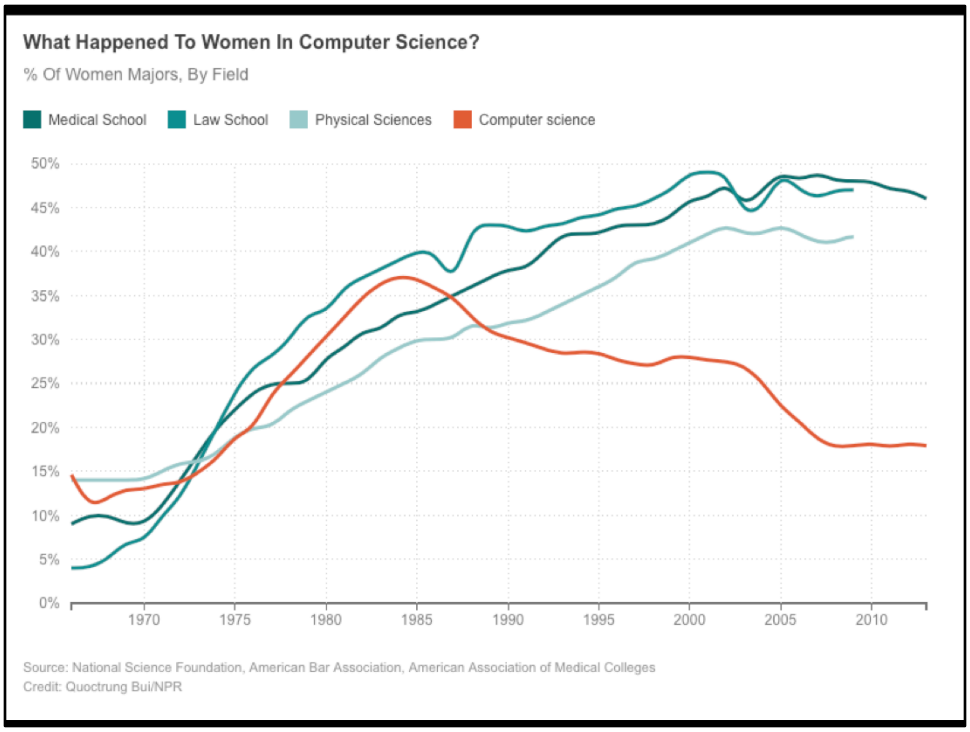
I was blown away when Jo Handelsman paid for a student in her lab, Heather Allen, to bring her sister to a genomics meeting so that her sister could watch Heather's baby daughter while Heather attended the meeting. With this generosity as an example, I would like to offer any trainee in this situation a $500 travel grant to defray the costs of child care for one meeting a year. Whether that's bringing along the kid and someone to care for them or support for the caregivers back home. Surely if they can do it in Madison, we can do this in Ann Arbor.

Please talk to me if you would like a travel grant – we and, ahem, our professional organizations, spend a lot of energy talking about work-life balance and very little energy doing anything substantive about it. I also hope that our benefactors, Rackham, and PIBS can get on board with this so that in a few years my small efforts are unnecessary because they're picking up the tab.

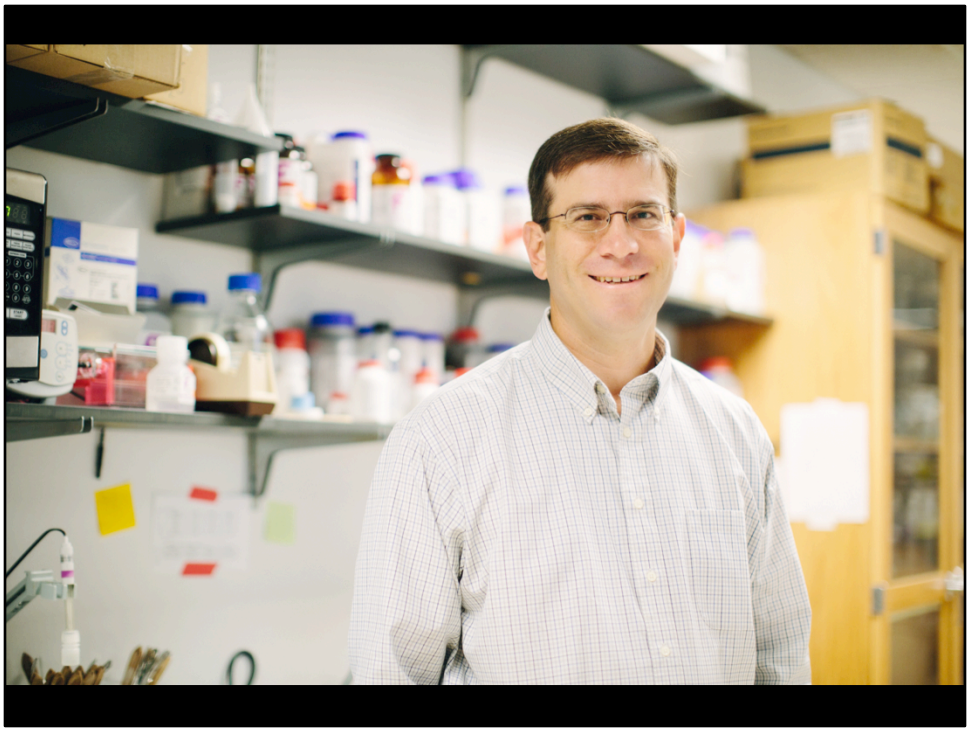
In Jo's lab I started down the path of my career doing quantitative analysis of microbial ecology data. Sure, I had the intellectual inputs of Jo and my lab mates, but no one else in the lab knew how to program. As I already mentioned, I could read books and do practice exercises, but I lacked a community and wound up making many mistakes and learning bad habits. With this in mind, we are creating a community around coding on campus where people can help each other in their own disciplines and by their peers. Two partner organizations - Software Carpentry and Data Carpentry - have spent the past decade developing such a community. They train people to teach workshops on the best practices for doing reproducible data analysis. Through the funds provided by the endowment, the University of Michigan has become a partner organization to Software and Data Carpentry. This formal effort started at Michigan through a collaboration with Meghan Duffy, a professor in Ecology & Evolutionary Biology.



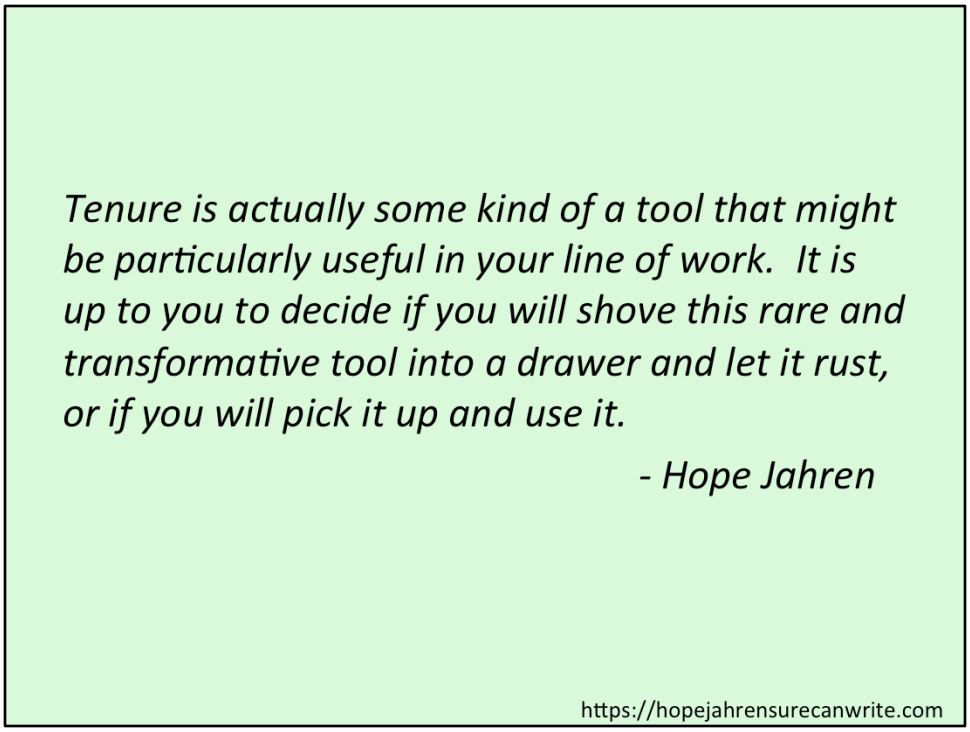
In January 2015 we organized a workshop directed only to women and instructed only by women. The 60 seats filled in five hours indicating to us that there is a clear demand on campus for this type of training, but also for the creation of personalized communities to help train scientists. Since then we have hosted other workshops taught by 15 trained instructors who are faculty, staff, but mostly students. Instead of having computer programming workshops taught entirely by faculty and staff, we are trying to emphasize student and postdocs as the instructors. Furthermore, we strive to have half the instructors and helpers at our workshops be women. Already 9 of our instructors are women and in the typical workshop we offer, more than half of the participants are women.



This is a far cry from the situation in computer science today where less than 20% of undergraduates are women. Although I love teaching the material and interacting with the learners, I would far prefer to never need to teach because I have empowered our trainees to take over. Thankfully, ADVANCE, WISE, and the library system have donated funds to help cover our costs further supporting the hypothesis that this effort is important. My very real hope is that this cadre of instructors and people learning to code will become a community that gathers regularly to review each other's code, offer encouragement, and teach each other new methods. If you would like to be part of this, please let me know.



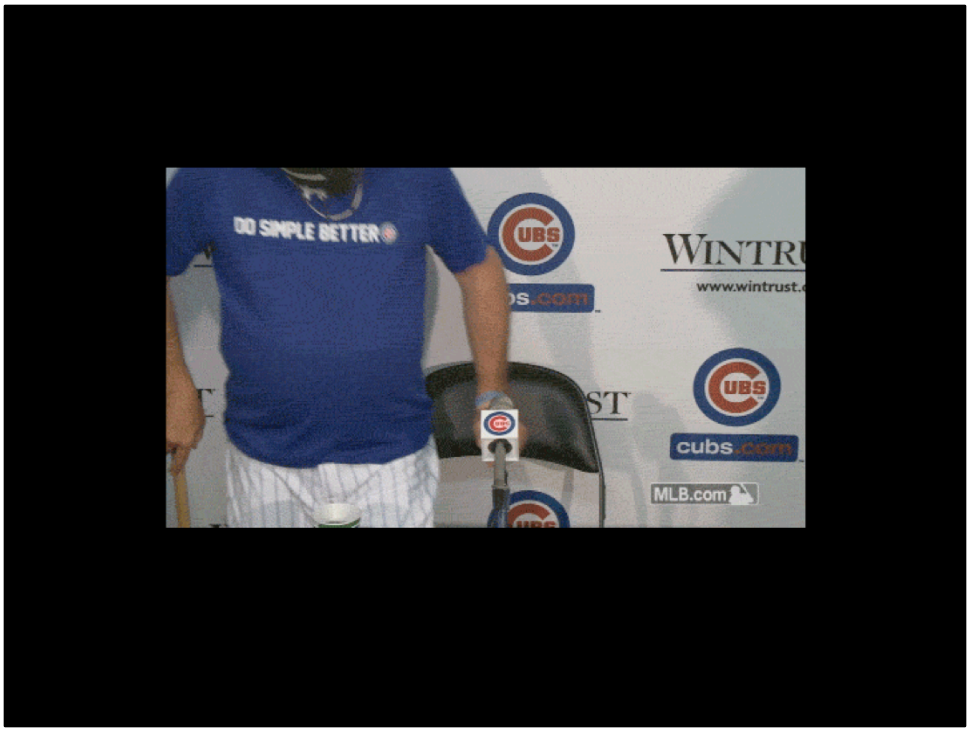
I apologize if this all comes off as a bit of a navel gazing expedition. But I hope that I have helped to put me - the guy with the 20 kids, farm, and obscene h-index - into context. I want you to know that I'm a screw up. I have sucked at pretty much everything I've tried. I do not live up to the ideals that I expect of others. I am grateful to those who have been patient with me or given me the time I need to not suck. I am also grateful to the Novy family and the benefactors who have helped to create this endowment. I want you to know that I take this opportunity very seriously and I look forward to using this tool I've been given to not just pad the coffers of my lab's budget, but to bring about the change I want to see.



In closing please think about that statement from Hope Jahren,

> Tenure is actually some kind of a tool that might be particularly useful in your line of work. It is up to you to decide if you will shove this rare and transformative tool into a drawer and let it rust, or if you will pick it up and use it.

By the fact that we are here in this institution or able to come to an event like this, you - yes you grad students too - and you Mary, Patrick, Joe, John, Ruth, Jacob, Peter, and even Martha - have already been given a tool. Are you going to put it in your drawer or are you going to use it?


DO SIMPLE BETTER
cubs.com
MLB.com