

Looking back on a life of unacknowledged privilege and a call to action

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ABSTRACT The year 2020 provided a wake-up call about the role systemic racism plays in shaping our nation and shaping science. While hard work and great mentors helped bring me a long way from a farm in Minnesota, it's become much clearer that the privilege of being white and male and the accumulated advantages that began there played powerful roles. It's time for white scientists like me to listen, think, and take action.

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We all have personal stories that we use to describe our trajectory in life and science. For the past five decades the narrative I told myself was a simple one of good luck, hard work, support from my community, and mentors at pivotal times. However, in many important ways, this was just a small part of the truth, ignoring the role unperceived privilege played. The many underlying injustices that were laid bare in our nation this past year began to open my eyes, prompting me to look back at the roles hidden privilege played in my career and the power that these have given me. This challenged me to use the power of that privilege to speak and act to try to change the system in which engrained advantages benefit some but not all. I am telling my story in hopes it will encourage my white colleagues to examine their own.

MY PARENTS' AMERICAN DREAM

I was born on a farm in central Minnesota, on land my parents rented to farm turkeys. When I was two, a tornado ended it and sent my parents, like many rural Americans, to find work in the city. Neither had an opportunity to go to college, and thus options were limited. With help from my uncle, my dad found work with General Motors, first as a janitor and then stocking parts. My mom got work as a bookkeeper. With my uncle's loan, they bought a small house in an inner Minneapolis suburb. My parents believed in the American Dream—through hard work, their kids could have a better life that didn't involve juggling two jobs while caring for two kids. My mom read to us from infancy and brought us to the library starting when

we were old enough to walk. The house they scrimped and saved to pay for was in a school district that included some of the wealthiest parts of the area. This gave us access to an excellent education in public schools at a time when Minnesota was investing in primary, secondary, and college education. When it came time to go to college, a state program paid for half of my tuition at the small college I attended, and tuition was low enough that my earnings as a nursing home orderly during high school and college covered one-quarter, leaving my folks able to fund the rest. At college, the educational foundation from high school and the work ethic instilled by my parents led to academic success.

Even more important, I found great mentors along the way and learned to acknowledge their impact, rather than thinking I "pulled myself up by my bootstraps." My high school debate coach taught me about library research and argument based on facts, and my history teacher revealed the real history behind the textbook, via primary sources, and a created a seminar where we discussed books that continue to shape my world view. A naturalist at a local nature center turned my love of the outdoors surrounding me in the still-wooded outskirts of the city into excitement about biology and field research. In college, Alice Burton opened my eyes to a new biology, a world of viruses and cells; tiny machines doing remarkable things. She used her network to find me a National Science Foundation (NSF) Research Experience for Undergraduates position at the University of Minnesota, where another remarkable mentor, Irwin Rubenstein, and his postdocs and graduate students, welcomed me into the lab and taught me to be a scientist.

Growing up, we had a roof over our heads, food on the table; heat through the cold Minnesota winter. Looking back, I see that my parents hid their struggles with bills piling up and never having quite enough money. I now see that never going to the movies, eating out meaning the occasional McDonald's, and vacations at my grandparent's rustic cabin in my dad's hometown reflected this. I remember once when it became obvious, a day in fourth grade when the

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entire class went to the circus and I stayed behind in the classroom with a teacher. In high school, because I did well academically, I took classes with kids whose dads were company vice presidents and judges, but my friend's parents were school teachers and car mechanics. Entering college, where thankfully there was no Greek life and no one had a car, social class was less apparent. However, I'd already developed a lifelong grudge against the wealthy, a chip on my shoulder around folks I felt had their way paved for them.

Graduate school brought those feelings back. My graduate class was largely from the "best schools" and many had parents who were professionals. They'd learned the secret codes I hadn't mastered. At the department retreat at Woods Hole the first month we all rode in a faculty member's sailboat, a bit of an upgrade from the 5-horse power motor rowboat my dad's family shared. Later that term, we were invited to Mark Ptashne's house, and he pulled out his violin to show off, something called a Stradivarius. That, combined with an exceptionally toxic department environment, meant that I and the other midwesterner in our class vowed we would go home for Christmas and not come back. Thankfully, we both stuck it out and found lab homes where mentoring rather than hazing was the norm. My new lab was small, and the Swiss postdoc was also first generation and has worked his way through school as a postman. It made me feel at home. With that behind me, the progression to a postdoc and a faculty job happened smoothly, something I again attributed to hard work and good mentoring.

THAT DREAM WAS ONE DENIED TO MANY IN MY OWN COMMUNITY

It's a heart-warming story: hard work pays off. The problem is it's not nearly the whole truth. Last year opened the eyes of many of us to the systemic racism underlying our nation and our scientific community. This prompted me to look back on my story with new eyes. Let's start with growing up in Minnesota. I grew up in an all-white world. In 1970, Minnesota was 98.2% white (Minnesota State Demographic Center, 2015; Gibson and Jung, 2002). My high school class of 300 had no Black or Hispanic students—diversity started and ended at three Asian-American students, two of whom were identical twins. But Minneapolis had a significant Black community, living less than 10 miles from my suburban house. We didn't have "whites only" signs, but restrictive covenants driving residential segregation made that unnecessary, building invisible walls between our communities (Hankin-Redmon, 2020). It was only when researching this piece that I learned about the riots in 1966–1967 in a community I drove through on the way to my grandmother's house, born of frustration with high unemployment and the impact of urban renewal on an established community (Paulsen, 2018; Burnside, 2020). In the 1966 riot, police opened fire on 11 Black teenagers and in 1967, events started with reports that police beat a 14-year-old Black girl. I grew up blind to these events in my own community.

The musician Prince was born 5 months before me (Delegard *et al.*, 2020) and grew up 10 miles away, but our different opportunities were shaped by racism, with school system boundaries mirroring housing segregation. When I say Minnesota supported public education, I should have said it did so for white students, especially in wealthy communities. Local property taxes supported 67% of school budgets (Hawkins and Boyd, 2008), something still true in most places in the nation, so I got a superb education funded by the wealthy parts of my school district. My hidden privilege started early—being white, male, and near a wealthy community allowed me to get a foot on the ladder.

It continued when I entered college. As a first generation student, my college search was not well planned. I applied to the

University of Wisconsin–Madison and the University of California, Berkeley, both late, and was rejected by both. Thankfully, I'd also applied to a small liberal arts college, St. Olaf—I was Lutheran, some people I knew had applied there, and they accepted me. It was another all-white, all-middle-class world, where being Catholic was exotic, where I knew the one Jewish student in my class of 700, where having brown hair made you a minority. But this didn't seem strange—it was just the world in which I lived. It was only 4 years later, having spent a term living in Jerusalem and seeing a world different than the one in which I grew up, that I started to wake up to the insularity of my experience. Having high school friends come out as gay also shaped this change. It sparked my first political activism, protests that included a group of us pooling our money to run an ad in the Minneapolis paper pointing out that less than 0.5% of the students at our college were Black (Shoemaker and Hoeun, 2014; Maranda and Strother, 2020). But this wasn't just my college—it reflected the underlying systemic racism shaping higher education. In 1973, the University of Minnesota was hardly better, where 2% of the student body was Black (Maas, 2019). It's true that Minnesota supported my college education, but that happened because I was white—the advantages I got in high school started compounding in college.

Those advantages, combined with good mentoring, led to my position as a technician in the Rubenstein lab, where I learned to be a scientist. That changed my life and provided the lab experience I needed to be a successful grad school applicant. But equally important, it introduced me to the secret inside world of science, allowing me to learn the lingo, to be able to pass as someone from the in crowd. It also gave me access to superb advice on how and where to apply to graduate school—things about which I had no concept a year earlier. They read my essays, coached me on interviews, and gave me a list of places to apply. To show you my naivete, it was then I learned that a place called Stanford was a "good school," and that places like MIT, CalTech, and University of California, San Francisco existed. All this paid off as potential doors opened at places I couldn't have imagined a year earlier. Only a few places interviewed students then, but the chance to visit Boston, Los Angeles, and San Francisco was a treat. I got good advice about what to look for in graduate school, but the stars in my eyes about a name I had heard about on television overrode their recommendations. In spite of meeting many unhappy students there, I chose Harvard Biochemistry and Molecular Biology.

In 1981 I entered graduate school in a class of 17—16 white, 1 Japanese, and 76% male. Of course the faculty were, with one exception in each regard, white and male. That fact didn't even impinge on my consciousness—for me that simply was the world of science. It was a world of class and privilege, largely East Coast and educated at the right schools, but being white and male combined with the year I'd spent learning the secret insider language allowed me to pass. I learned rapidly to pretend to be someone I wasn't, without the indelible marks of skin color, accent, or name to betray me. After moving to the Medical School to escape the toxic environment in Cambridge, nothing changed in that regard. The Biological Chemistry faculty were all white and male, and all the students I knew in what became the Tridepartment program were also white. Change came in one way—in the mid-1980s, a few carefully selected students from China entered our program. Once again, my institution wasn't unusual. In 1986, 66% of life science PhDs were awarded to male students (vs. 45% in 2016; NSF Data Tables, 2018). From 1980 to 1990, only 2% of Life Science PhDs went to Black students (Solorzano, 1995), and by 1996, this had only increased to 2.85% (NSF Data Tables 2, 2018). I still remember the first time I met

a Black scientist, when a young postdoc, Ron Booker, visited our lab to learn about screening genomic libraries. During grad school I went to my first scientific meeting—the Fly Meeting. It was exciting to meet scientists from around the world, but with the exception of folks from Asia, it was also an almost exclusively white community. But I didn't even notice this, because, of course, I fit in—another reflection of the hidden privilege from which I benefited.

EACH ADVANTAGE MADE THE NEXT ONE EASIER TO ACQUIRE

From then on, the privilege I had being white and male synergized with my “pedigree,” as the “Matthew effect of accumulated advantage” kicked in. This helped me immediately fit into a lab at Princeton—one where the gender balance was better but the only non-white member was the woman who changed fly stocks. Princeton, both town and undergraduate university, were home to the gentry, where Malcolm Forbes' hot air balloon appeared at the reunion. In our department, I don't think there was a single Black scientist. This was somewhat ironic because every day I walked to work through Princeton's miniscule formerly “Black neighborhood,” birthplace of Paul Robeson, the pioneering Black singer, actor, and activist. While the gender situation was locally better, Department Chair Arnie Levine was openly misogynist. I vividly remember him ridiculing Shirley Tilghman and Trudi Schüpbach when they asked folks to sign a letter supporting Anita Hill during the Clarence Thomas hearings. But I fit in, especially with my 6.5 years of graduate school to school me in academia's hidden curriculum. I had great mentors, the dual lab heads Eric Wieschaus and Trudi Schüpbach, the surrounding young faculty, and peer mentors among the postdocs and students. Eric gave me the chance to attend several international meetings in his stead, once again opening new doors.

My accumulated advantages helped me navigate the job market and land a faculty job at the University of North Carolina (UNC)—Chapel Hill. It's been ideal for me, with great colleagues and a fun, supportive vibe. But looking back, I entered a place where my white male privilege ensured I'd fit in; 36 of 42 faculty were male, including 29 of 32 tenured faculty (UNC Biology Annual Report, 1992). All except my Black colleague Lillie Searles were white. But once again this seemed normal, as throughout my career faculty were entirely white, mostly male since college when my mentor, Alice Burton, was the only female professor in Biology. We weren't alone—in 1993, only 4% of full-time life science faculty were from underrepresented groups (National Science Board, 2016). Sadly, change is very slow. Seven years ago, our department of ~50 faculty had a single non-white faculty member—we've since added four Latinx, Asian, or Black faculty. Being white and male was something I shared with my first five Department Chairs, making it easier for me to approach them and for them to offer me help as my career progressed. Was this calculated on either side? Probably not, but it was always in the background. Did it play into my being chosen for nomination for several “prestige junior awards,” unlike more senior female colleagues? Getting one of those awards was the next advantage I accumulated, connecting me with the “elite” folks who would go on to help “lead” our field, as HHMI Investigators, the President of Stanford, or the Head of Science at the Chan-Zuckerberg Foundation.

Attending the Cell Contact and Adhesion Gordon Conference during the last year of my postdoc opened new doors, providing an entrée into the cell biology world. Once again mentors were important—field leaders like Masatoshi Takeichi, James Nelson, and Rolf Kemler welcomed a “fly guy” into the fold, and I became one of the in-crowd, invited to speak at essentially every meeting. It offered the

chance to meet and build collaborations with folks in my generation like Barry Gumbiner and Kathy Green. This was a more international group but at the senior level, still overwhelmingly white and male. Pedigree and connections led to seminar invitations around the country and to an invitation as a very junior faculty member to serve on an American Cancer Society Study section. That proved invaluable in making my own grants better, a premier example of how one advantage powers the next. It secured me an invitation to serve on an National Institutes of Health (NIH) Study Section, and connections there led to a position on the National Institute of General Medical Sciences (NIGMS) Council. My Gordon Conference connections led me to the American Society for Cell Biology. This wasn't a calculated strategy—I'm not that clever. It was simply the “Matthew effect of accumulated advantage” in action. We've built a self-reinforcing system where all the levers move without conscious intervention, strengthening the status quo.

This became glaringly apparent as I served last year on Council for the Center for Scientific Research (CSR), the folks who organize NIH grant review. One issue on which we focused are the striking racial disparities in NIH funding (Byrnes, 2020), an issue first raised a decade ago by data revealing that Black principal investigators (PIs) were only 55% as likely to receive an award as white PIs of similar academic achievement (Ginther *et al.*, 2011). Recent follow-up revealed little has changed (Hayden, 2015; Ginther *et al.*, 2016; Erosheva *et al.*, 2020; Hoppe *et al.*, 2019; Gluckman, 2020; Taffe and Gilpin, 2021). One big issue is explicitly built into the system (Lauer *et al.*, 2020)—even if peer review outcomes are similar, the topics on which many Black applicants choose to work are assigned to institutes with historically lower funding rates. This is systemic racism at its finest. This conversation at Council helped prompt my introspection. Unconscious and conscious biases operate in two directions: biases against certain groups based on race, perception of their institution, and pedigree are important and insidious and work side by side with similar, likely equally powerful biases in favor of folks who look like us, in race, institution, and pedigree. This is the arena where the Matthew effect is most powerful, a thought supported by the data (e.g., Wahls, 2019). Each early advantage makes the next step a little easier.

WE CAN CHANGE THINGS, IF WE HAVE THE WILL

Here at UNC I watched a colleague, Sharon Milgram, create a pilot interdisciplinary training program that was the seed of our current campuswide Biological & Biomedical Sciences Program (BBSP) program. In doing so, Sharon put increasing student diversity at the center of her work, hiring a dedicated staff member and putting her own prodigious efforts to work. In 15 years UNC made remarkable progress, with 20% of our students from underrepresented groups and completion rates similar among majority and minority students. This is supported by a strong professional development program, including the NIH-funded Initiative for Maximizing Student Development (IMSD). We support the next generation through a very successful Postbaccalaureate Research Education Program. At the undergraduate level, UNC's McNair program and Chancellor's Science Scholars work in a similar way. But progress at the faculty level has been disappointing, as is true nationwide. My experiences with colleagues who created the Chancellor's Science Scholars and my interactions with our IMSD students helped me begin to understand why. The micro- and macroaggressions they face, in the community and in our labs, mean every achievement is that much more difficult.

I drafted this piece in late December, before the violent attempt by white supremacists to overthrow our government, a remarkable

reminder of the power of white privilege. As we enter a new year, here is my challenge to myself and my white colleagues. Look around you, really look, and think about what you see. Look back at your own careers and think about roles hidden privilege played. Listen to the voices of our Black faculty and trainee colleagues, nationwide and at our own institutions, when they remind us that overt and aversive racism, microaggressions, and the long history of systemic racism shaped the current scientific environment in our fields, departments, and universities. The scientific press has provided many chances to do so this past year—make the time to read them (e.g., Dzirasa, 2020a; McGill *et al.*, 2020).

Then take action! Some things are simple: work harder to find a diverse group of speakers and presenters for meetings and seminar series in which you are involved, and ensure that organizers of the scientific meetings we attend do the same. Nominate Black colleagues for awards from scientific societies of which you are a part. But other issues are more challenging. One issue critical for our community is ensuring that Black faculty compete on a level playing field. As white scientists, we can use our voices to demand an end to racial disparities in NIH funding. Our colleagues presented thoughtful suggestions for how to “Fund Black Scientists” (Dzirasa, 2020b; Taffe and Gilpin, 2021; Stevens *et al.*, 2021). I am working in my role on the NIH CSR Advisory Council to advocate for concrete changes to address racial disparities in NIH grant funding. Educate yourself and become an advocate—join me in writing to NIH Director Francis Collins demanding concrete changes to eliminate disparities. Work within your scientific societies to advocate adding their voices to this call, as did the American Society for Cell Biology (<https://www.ascb.org/science-policy/ending-racial-disparities-in-nih-funding/>)

Many of us combine roles as scientists and educators and our universities are also places where systemic racism plays a powerful role (Barber *et al.*, 2020). From the gate-keeping power of standardized tests to the systemic and overt racism on our campuses to the extra burdens we place on our few Black faculty to “do diversity work” while not supporting them in their many roles, powerful forces act to make STEM education less than equitable. I am proud to be at a public university that uses programs like the Carolina Covenant to reduce barriers and have taken on a new role as co-PI of an NSF-funded Research Experience for Undergraduates program, UNC’s SURE program, to help students from underrepresented groups on other campuses get summer research experience at UNC. Become an advocate for change at your University, working to make our classrooms and campuses more inclusive using evidence-based practices (e.g., Theobald *et al.*, 2020). More broadly, demand that our campuses, as Beronda Montgomery so eloquently put it, make equity *essential* in all ways within our communities (Montgomery, 2021), from taking more holistic approaches to admission to developing more comprehensive support programs for students from all backgrounds.

Perhaps our major challenge is our collectively abysmal record at hiring and supporting Black faculty. For example, only 75 of 1693 faculty at UNC’s School of Medicine are Black (4.4%; https://www.med.unc.edu/inclusion/files/2020/03/UNC-SOM-Faculty-Diversity-Report_FINAL-2018.pdf). Systemic racism is a powerful force, and our actions speak louder than our words. We must provide Black trainees and faculty access to the same mentoring and networks that helped me succeed if we want to take significant steps forward. I must continue to listen to and help mentor Black students and students from other underrepresented groups in UNC’s IMSD Program and advocate for them in my own department and our BBSP Program. I and we all must find ways to listen to newly hired Black

MEET THE AUTHOR



I am a Professor of Biology at UNC–Chapel Hill where I have been since starting my first faculty position here in 1992. I am both a teacher, teaching undergraduates Cell and Developmental Biology, Cancer Biology, and Global Public Health, and a researcher whose lab studies how the animal body plan is self-assembled, exploring the roles of cell adhesion and the cytoskeleton in morphogenesis and the role of Wnt signaling in choosing cell fate. We use the fruit fly *Drosophila* and cultured mammalian cells as models. One of the best parts of my career is the ability to work with talented folks at many career stages, and I am proud of all of the undergraduates, postbac students, graduate students, and postdocs who have passed through the lab—they have taught me so much. I live with my spouse and dog out in the country west of Chapel Hill, amidst 35 acres of trees, where we raise songbirds and wildflowers. We have two daughters who both attended public schools in rural Orange County and graduated from UNC. One left for the Peace Corps in the Republic of Georgia, returned for her MSW, and now is a social worker for the Alamance County Health Department. The other is now a student teacher in a second grade class in Durham County. My scientific journey is laid out in detail in this piece.

faculty colleagues and help them navigate the academic and grant system. We must ensure our departments evaluate them equitably. Finally, we must challenge our departments and universities to think outside the box using efforts like cluster hires and other approaches to actively build a more diverse faculty. I hope my friends remind me of these promises and hold my feet to the fire.

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