

Anastacia Awad: Women in STEM outside the lab

 Stephanie Houston 

Anastacia Awad is the Head of Diversity and Inclusion (D&I) globally for the Novartis Institutes for BioMedical Research, which is the research engine of Novartis. She completed her PhD in genetics and molecular biology at the University of North Carolina at Chapel Hill, followed by a postdoc with Alan Hall at Memorial Sloan Kettering Cancer Center. I chatted with Anastacia about her career in science and her journey from the bench to industry.

Where did you grow up?

I grew up in South Louisiana, the daughter of parents with deep roots in the state. On my father's side, I can trace our heritage and family back to the early 1800s due to my paternal surname and family history in one parish (the Louisiana name for counties). My paternal grandparents spoke French-based Louisiana Creole, and the French language was an integral part of my early education. I remember struggling to distinguish the French pronunciation of words from the English version in a time when children would tease each other for not knowing the difference. My mother's side is more closely linked with Cajun heritage. I have fond memories of tapping my feet to the local zydeco music and eating boudin and crawfish. Rice was a major food staple and served with everything! Food was at the heart of the South Louisiana experience, and our family was no different.

When did your interest in science begin?

What was your first experience of science?

Though I lived in a city, much of my early childhood weekends and summers were spent on my granddad's farm near the bayous, a place where the pecan trees were plentiful, the crawfish were crawling, and the watermelons grew very big and oblong. It was a natural playground for a young curious mind. I spent my days chasing rabbits and collecting little frogs for my patient parents to admire. I pondered hundreds of questions about the world around me and got to watch life cycles in real time. My curiosity continued with

chemistry sets, geology rock sets, and ever-growing ant farm collections. In school, I participated in all the science fairs during my primary education and even won a few awards.

One of my earliest science experiments involved a sweet potato from my granddad's farm. My primary school assignment was to take a potato, sprinkle some water on it, and leave it in a warm place to grow sprouts for a couple weeks. Most of my classmates had white potatoes from the grocery store and started their experiments on time. I forgot about the assignment and had to rush my process the night before. I took one of my granddad's sweet potatoes and soaked it in water. I put it in a sealed plastic container and placed it on top of the refrigerator directly opposite an air vent. Then I turned up the heat. Many things grew that night, none of them sprouts! I learned a valuable lesson about procrastination, differences in sugar content between sweet and white potatoes, and microbial growth.

Where and with whom have you studied (undergraduate, graduate, postdoc)?

I attended a specialized magnet high school for engineering professions to fully immerse myself in STEM. My favorite classes were in the sciences, architectural design, and electives like languages (Latin, French, English) and art. The experiences helped me to focus my STEM interest in life sciences. They also provided lessons in belonging. My 10th grade computer science class included the Pascal programming language. To help us learn in a "fun" way, my teacher allowed the class, by majority rule, to select a theme for



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coding: Simon and Garfunkel, a popular American folk rock group from the late 1960s. I had never heard of them before. I had no reference points for their history, songs, concerts, or fun facts. All the lessons and discussions were based on this cultural reference. It made learning the programming language really difficult for me. There was no Google, Wikipedia, or YouTube to help me. I felt like an outsider. While my teacher had good intentions, an opportunity for equity was missed. Had she allowed each of us to choose our own topic, a sense of belonging could have been established, helping all of her students to thrive.

I received a full academic scholarship to attend an historically black school, Florida A&M University. It was a relief to not worry about paying for tuition, housing, or books. I majored in biology with a minor in

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chemistry. I was surrounded by so many bright, intelligent students of African ancestry, Asian ancestry, and Hispanic/Latino heritage. It was my first time being in a majority, and the sense of belonging was incredible. I thrived and even was elected (and senate-confirmed) as the university's electoral commissioner to lead their student elections. Initially, I was on a premed track for my degree with every intention to take MCATs and apply to medical school. In my junior year, I took a molecular biology course and just loved it. I knew I wanted to explore this and research more. My professor ran a small molecular biology laboratory on campus, and he invited me to work in his laboratory a few days per week. I also completed two summer research internships. The first experience involved understanding how to convert crab shell waste into useful energy products. Following my earlier interest in microbes, the second internship focused on using native bacteria *in situ* to remediate superfund sites. I also helped to establish a new club for students interested in scientific research and eventually became its president.

My professor recommended his alma mater, Michigan State University (MSU), for pursuing my graduate degree. I entered their PhD program in microbiology and molecular genetics through a grant for under-represented minorities. It was a perfect combination of my two research interests at the time. I spent that first year in courses and several laboratory rotations including investigating mechanisms driving guide RNA function, researching virulence of *Campylobacter jejuni* in pig models, and understanding effects of hypergravity on osteoblast functions. I made many friends and was often up late doing laboratory work, attending study groups, or just socializing. As a result, I was quite sleepy in my biochemistry class. One day, the professor started his small GTPase section of the curriculum. I was fully awake and enthralled. He had me at "on/off" switch. We discussed signaling pathways, regulatory mechanisms, constitutively activating mutations. I wanted more! More existed, but not at MSU. I decided to switch universities, and PhD programs, after one year so that I could pursue this fascinating class of proteins. University of North Carolina at Chapel Hill had a PhD curriculum in genetics and molecular biology with several principal investigators focused on small GTPases. I

joined Adrienne Cox's laboratory and dove into the cancer biology world of RAS, RHO, GEFS, and GAPs. Her enthusiasm for small GTPases paralleled my own. Together, I learned rigor in scientific inquiry, strong presentation skills, and how to publish well. I was awarded a competitive predoctoral fellowship and a dissertation award based on how small GTPases localize and function at distinct cellular locations. Dr. Cox also had one of the more diverse laboratories on campus. When I joined, I was one of three black scientists in her laboratory!

In my third year as a PhD student, I met famed scientist Alan Hall at a small Ras superfamily conference in Vermont. He was the keynote speaker and well known for his work on Rho family GTPases and their impact on cell morphology. My plan was to share my research with him at the evening poster session. Due to an unexpectedly long hike during the afternoon break, I arrived at the poster session late, missing Dr. Hall. Undeterred, I decided to wait for him by the dinner hall with some bonus data slides. When he arrived, I hustled over to his table and joined him with several other principal investigators by saying, "Hi, I'm Anastacia, mind if I join you?" We had a great meal, I shared my work with Alan, and I even got his autograph! Dr. Cox rushed over at the end of the meal to capture the moment by photograph. It is one of my favorite pictures and memories. Dr. Hall certainly remembered me when I reached out a couple years later to express my interest in joining his laboratory for my postdoctoral fellowship. He informed me that his laboratory was moving from University College London to Memorial Sloan Kettering Cancer Center. This news was very exciting for me since I wanted to continue research in cancer biology, and small GTPases play critical roles in transformation. As a postdoc, I could choose any area of study at the intersection of Rho family proteins, oncology, and cell biology. I chose to explore the Rho family-regulated pathways involved in glioma migration and invasion. At the time, glioma was the leading cause of death in primary brain tumors. I wanted to work in area of greatest need. My research was further supported by an American Cancer Society postdoctoral fellowship.

When did you decide to leave the bench?

In some ways, I always knew I would leave the bench, even as a graduate student. I remember attending sessions as a second-year

student to better understand these other careers in science beyond the professoriate. My curiosity was from the perspective of "how can I bring true value and impact scientifically as my unique self?" rather than "what is my escape route from bench science?" I am an enthusiastic, purpose-filled person, and I radiate a ton of energy toward areas I find incredibly interesting. I have always taken a pause-and-reflect approach to ensure that I am directing my energy in the most impactful way. I also ask whether I am in the way of something or someone that could bring greater value. I like sitting in those spaces of intersection, whether they be cross-disciplines or overlapping identities, where interesting new thinking or ideas can arise. From a career perspective, being able to transition from bench science to other areas would invite more of those intersectional spaces into my world.

As a postdoctoral fellow, I began to earnestly consider life off the bench. I was in New York City at the time and surrounded by people, scientists and nonscientists (think finance, entertainment, marketing, restaurants, etc.), who just thought differently about their careers and life. I attended a career panel hosted by the New York Academy of Sciences on nonbench opportunities. A woman spoke about scientific programming. I reached out to her after the panel, and we met for a coffee. This coffee led to an interview with the vice president of New York Academy of Sciences at the time, Stacie Grossman Bloom, and human resources. While I was not a good fit for the director-level position in consideration, I was invited back for a part-time 5-mo internship with them. I spoke with Dr. Hall about pursuing the internship, and he agreed as long as it didn't interfere with my research. I interned once a week to balance my time with my experiments. I liked applying my scientific acumen to a new space, and the internship reinforced my choice to leave the bench. Although I made my choice, it wasn't an easy one. I was filled with so much self-doubt that I reached out to my graduate advisor, Dr. Cox. I wanted her counseling, even forgiveness, to make this choice because I was worried about disappointing her and others who had given so much to train me as a bench scientist. Ever kind, Dr. Cox insisted that I needed to live my life for myself and be happy. She also reassured me that I had her full support, and

she continues to give this today. In my fifth year as postdoc, I applied for and accepted a job at Novartis Institutes for BioMedical Research (NIBR) to manage early scientific training programs for undergraduate interns, postbaccalaureate students, and postdoctoral fellows.

What is your current role?

I am Head of Diversity & Inclusion (D&I) globally for NIBR. NIBR is the research engine of Novartis, a global pharmaceutical company headquartered in Basel, Switzerland. I am based in Cambridge, MA, the research headquarters, and oversee D&I efforts for ~6,000 employees in the United States, Switzerland, China, and Japan. I also lead through a collaborative global D&I leadership team, including the global head of D&I for Novartis, country-level D&I heads, and divisional heads of D&I for the broader Novartis enterprise of nearly 110,000 employees in 140 countries.

Novartis embraces D&I as a driver of innovation and performance. Integrating D&I into our core work is critical to delivering innovative medicines for a diverse, global patient population. My role is advancing a comprehensive D&I strategy globally for Novartis and NIBR that enables scientific, collaborative, and social impact through an equity, inclusivity, and society focus. This means ensuring that we have diverse perspectives in the room, those perspectives are included, the environment is receptive to those voices being shared, and we are acting on those perspectives to enhance our innovation and how we perform. This is not solo, superhero work. I rely on an expansive community of support to move the work forward. I work across Novartis and NIBR senior leadership, global D&I leadership, human resources organizations, inclusion councils, learning organizations, employee resource groups, and communications.

What kind of approach do you bring to your work?

My role is one of influence and impact, rather than teaching people the fundamentals of D&I. I focus on illuminating the choices we face every day as an organization and how we can use D&I to influence those choices. For example, how would a D&I mindset help us to ensure we have diverse voices and perspectives at those key decision-making moments that drive our systems and policies? What would it look

like to think inclusively about the diseases we target and how we target them for a diverse patient population? What innovations are we missing out on if we are not diverse in our collaborative partners? How might we benefit from expanding access to and for more diversity in collaborative partners?

D&I is not an automatic process that you can set and forget. Continuous, intentional application of D&I behaviors, systems, and policies over time is needed to promote sustained, scalable impact. A thoughtful approach means taking an inventory of the spaces in which we make decisions, asking questions to understand the status quo or data for the environment, and choosing investments that redefine status quo as equity and inclusivity. For example, when thinking about talent pipelines, a D&I approach for equitable access with the most diverse talent could involve ensuring that every position has a balanced candidate slate and interview panel to disrupt status quo bias in hiring.

I believe that D&I lives in our conversations and our choices. Acknowledging inequities and opportunities, through the practice of listening, helps to focus inclusion efforts more effectively. I also believe we have to allow for imperfection so that those of us seeking to understand can ask questions and share needs. Grace with each other is welcomed as we engage in this important, albeit challenging, work of inclusion together. D&I is deeply personal for me. I continuously tap into my own vulnerability as I lead this work. To bring humanity and humility to this space means bringing our employees and organization closer to our patients and the impact on society to which we aspire.

What is a typical day like?

My day typically starts early in the morning with a quick check of overnight emails coming in from colleagues in Europe or Asia. After a decaf coffee or two and some breakfast, my day is a series of chats and virtual meetings with teammates, individuals, leadership teams, etc. In those meetings, either I am leading discussions, asking coaching questions, listening, identifying opportunities, or sharing recommendations. I reserve time to design and iterate informative slide decks to give structure and frame to upcoming conversations in between meetings. Once a week, there is usually a workshop or seminar that I will prioritize on best practices

in D&I, equity, coaching, leadership development, or scientific decision-making.

I will admit that the highlights of my day are the “Hi Mommy” visits from my 2-yr-old son. He stops by my home office at least twice a day. Sometimes he wants a hug or two or three. Other times, he brings me some freshly made vegetable and fruit juice surprise from his kitchen experiments with my husband. The most recent experiment involved beets, celery, carrots, ginger, and apples. He just brightens my day.

Have you found any specific practices which have helped you during your career?

Meditation as a practice has been hugely beneficial for me. I keep an app on my phone that provides guided sessions for varying lengths of time, including 3-5 min sessions that I can squeeze in between meetings. It helps me to clear my mind and bring focus to the next topic at hand. I am lucky to have colleagues and leaders that encourage taking these breaks for self-care and centering.

When I was earlier in my career, I had a mentor who gave some honest feedback to me after I led a particularly challenging discussion with a group of senior leaders. She told me that my stubbornness was getting in the way of an effective conversation. Then she told me not to let go of my stubborn nature. Instead, I needed to channel that stubbornness appropriately to have the impact I desired.

Seeking the underlying context behind a question or statement is a constant practice for me. My current manager, Lisa Naylor, once told me that people will frame questions based on solutions they already know or understand. It is my role to realize what they are actually signaling in terms of their need from me. For example, my 2-yr old will tell me that he wants animal crackers and orange bread. That is his code for “Mommy, I’m hungry. Where are the dinosaur chicken nuggets and cauliflower?” At work, imagine someone in my organization asking me to tell them what to do be more inclusive. I could answer them directly with many ideas on what I think, but my solutions may not be relevant or effective for their need or their groups. A better option is for me to take their ask as a signal that they do not have clarity on how to have impact. This understanding yields a different conversation between us and an opportunity to frame guidance that helps them solve for the most impactful outcomes for themselves.