

ESSAY

ESSAY SERIES: EQUITY, DIVERSITY AND INCLUSION

Uniting diversity to create a more inclusive academic environment

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One year ago, a few scientists residing in Sweden came together due to many recent worldwide events and personal experiences that have highlighted the need for equity, diversity and inclusion in academia (Urbina-Blanco et al., 2020; Manuel and Karloff, 2020; Reisman et al., 2020). We represent different career stages, and we work in different fields of science. Moreover, we all have different backgrounds and ethnicities. Open conversations have taught us this: a shift in academic culture and climate is needed to appreciate diversity and harness the power of inclusion. To support well-being and inclusiveness in academia, we established a diversity, equity and inclusion (DEI) committee at the Science for Life Laboratory (Stockholm, Sweden). In this essay, five of us share our stories and insights. We believe that creating strong connections of support and love can be life changing (A.V.), and that we need to prove diverse representation to thrive (A.R.-G.). Understanding all dimensions of diversity and fostering humans will create a more equal society (S.L.G.). We finish by explaining the power we have together: by being kind and helping one another we can improve academia for all of us (E.S. and L.D.).

Insight 1 – wonders of life and life sciences

A.V.: I grew up in an educated middle-class family in Finland. I was provided with good education, health care, and support in my academic endeavor. All was good, but I had a secret that I kept from my family, peer students and academia in general. I lived in a closet. Life in that closet made me skip parties and events, and it prevented me from getting to know people and being open to my closest ones. I ended up building quite a Narnia, containing gay friends, teammates, a fiancé, and a child on its way. When I finally came out, I did not know how academia – my colleagues, friends, and collaborators – would take the news. Luckily, inclusiveness was already emerging and the main change that happened was that I became more approachable. Sharing my insecurities made others feel comfortable to share their experiences, fears, worries and insecurities, too. They also shared their joys. My student at the time reacted to my news of getting married and expecting a kid with “How wonderful, congratulations!” and, “By the way, I’m gay, too”. Imagine that. We’d spent a year sharing the wonders of life sciences, but not the wonders of our own lives. You might – rightfully – call my ‘gaydar’ defective. I defend myself by stating that I dislike putting anyone into a box. We all are wonderful versions of ourselves, regardless of how we wish to be defined, or undefined, regardless *and because of* our cultural backgrounds and inherited traits. In the lab, we study how cells gain their identity during differentiation, and how cells can remember experienced conditions (Vihervaara et al., 2021). Like our cells, we establish our identities via experiences, through people we meet and how we are met. I have had many allies along my long road of getting out of the closet. These include a priest who took a strong stand for gay parents when my first-born was baptized, and it includes the >166,000 Finns who forced through the legislation that allows gays to get married. Allies are important! How we encounter and support one another is important! After coming out, I’ve enjoyed tremendously getting to

know new people, different from who I am. You all have shown me perspectives that I did not know existed. Please, join our journey to create an academia where everyone is safe to be, or become, who they are.

Insight 2 – representation matters

A.R.-G. (he/him): Our research articles always start with comprehensive introductions to explain all relevant contributions made by many authors of the field. These sections are fundamental in scientific writing as they frame our work, both in time and within the scientific field, providing a major context for the appreciation and the importance of our contribution. These references support our work and help us to understand our efforts. As we all know, references are crucial to project our work and even ourselves in any spatial or temporal context. For so many years, I was a young LGTBIQ+ kid that lacked the perspective to decide where I wanted to go or what kind of person I wanted to be. I struggled to find my niche and understand my place in society. Nowadays, many youngsters are on a journey similar to mine, some of them trying to find their place in science. However, references and role models might have a really mighty effect on our future development, both personally and scientifically. Big names from history like Alan Turing or Sally K. Ride can serve as life inspiration for many: although they may feel distant, we can relate to these figures and understand that, regardless of our sexuality or gender identity, we can succeed and shine in any scientific field. However, I feel the need to highlight the crucial role that lesser known scientists have on science. Models like Izzy Jayasinghe or Jan J. Eldridge and the members of different EDI organizations play a vital role in social media outreach and undergraduate education. Intentionally or not, being visible helps younger generations to know they are worthy to be wherever they want, to do science and even appreciate their own effort and work. We should provide future generations with figures to be inspired by.

Insight 3 – understand and foster diversity

S.L.G.: I was born and grew up in Mexico as part of an undereducated family. My journey in science has taken me to live in three more countries. Being an immigrant is not easy, but my passion for science drives me. Microbial ecology has taught me about how great diversity is – hundreds of thousands of ‘species’ of bacteria serve as engines that drive Earth’s biogeochemical cycles (Schloss et al., 2016; Falkowski et al., 2008). Bacteria are small organisms with small genomes; their small size and small genomes mean that to carry on the big biogeochemical processes they need to cooperate and rely on each other (Mondav et al., 2020). When we try to grow these bacteria in the lab, under rich media (such as LB medium) and in isolation, most of these bacteria will fail to grow and multiply. Our academic culture very often resembles LB medium: it has all the nutrients that one can think bacteria need to grow, but it fails at fostering and nurturing the great diversity of abundant and important microorganisms in the environment. It is by understanding the vast diversity that we can truly learn how to



Fig. 1. Uniting diversity and harnessing the power of inclusion. Different scientists perform research on different scientific fields (represented as bubbles). Our common goal is to uncover the mysteries of nature; this unites us all and makes us stronger.

foster it and make it thrive. During my academic journey, I have had to run twice as fast to get to the same place than others do, simply because of my immigration or economic status. I had to invest time and energy applying for visas and working part-time to make a living instead of starting early in research like others did. Meritocracy can only be a real meritocracy if we all have the same opportunities. I know the current system needs to change in order to increase representation and make the environment inclusive.

Insight 4 – be kind to each other

E.S.: Growing up in a big Kurdish family, in eastern Turkey in the 90s – politically tough times – it was not hard for me to learn what really matters in life: sticking together, being kind to each other, appreciating each other... My whole life has become the extension of these family codes. I have been an immigrant a big portion of my life and every step of the way has taught me so much about similarities and differences, likes and dislikes, and dos and don'ts of various cultures. And, I believe, a true inclusive environment can be achieved only when all this variety is appreciated. Not tolerated, not accepted, but appreciated! Our lab works on the collective behaviour of cell membranes, the barrier between the inside and

the outside of the cell. This membrane has hundreds of different types of lipids, each slightly different in their structure (Sezgin et al., 2017). One of the major questions in cell biology is why do we need so many different lipids in our cells? We now know that the membrane is bigger than the sum of the individual components, because of the collective behaviour of all these different lipids. I see the academic world as a big membrane. A lot of us, slightly different from each other, but our true potential is when we are together.

I have the famous 'The Pale Blue Dot' in my office. Looking at it reminds me everyday that each of us is a universe, but at the same time, a dust particle in the grand universe. Why not accept the humility and be kind to each other?

Insight 5 – we are stronger together

L.D.: An intuition I have had for as long I can remember is that we are stronger together; that we achieve more and go further by listening to and incorporating different voices, ideas and inspirations. However, working in a team requires us to be open with our thoughts, revealing ideas that might or might not be recognized as 'good'. The feeling of vulnerability that comes along with this is scary. In academia, in addition, we are constantly

evaluated by our peers and others. It is a competitive field, and imposter syndrome prevails. I believe a supportive and nurturing environment is necessary. Not only because it is right to treat people well, but also because it is the way we will make more meaningful discoveries and push the boundaries of human knowledge. My research group works on molecular biophysics – on understanding how macromolecules such as proteins perform their work in the biological cell (Carnevale et al., 2021). We have team members from various backgrounds, ranging from biology to applied maths, via computer science, theoretical physics, chemistry and biotechnology. Anyone can feel intimidated by the knowledge of others, as we can always feel that we don't know as much as we 'should'. A supportive environment is critical to turn this into opportunities to learn, for ourselves and for the world. In an inspiring way, proteins working in a cell also do not work alone, they take part in large networks, get help from one another and unsuspected phenomena can emerge from individual molecules coming together.

I have been lucky to be surrounded by many others along my academic journey, and their support has meant a lot, especially in the face of rejection of grants, papers and ideas! I like to try and pass on what I was lucky to receive. I would also like to get better at supporting people with even more diverse backgrounds. I am convinced we are missing out on essential scientific and personal discoveries when people from many walks of lives are excluded from our labs. That is my wish for myself and my lab.

How to create an inclusive academia? How to embrace one another with empathy? Our first steps towards an inclusive society are to understand biases, including those in our own views and behavior, and acknowledging diversity as a strength. Our DEI committee has taken a bottom-up approach to allow the voices of diversity to be heard. We have initiated 'Raising Our Voices' and 'Our Community – Ourselves' series, where mental health and diversity in all its multidimensions are discussed. Our journey has just begun. We need more awareness and self-reflection, and then, translation of the obtained knowledge into collective engagement and growth into a more inclusive academic culture and environment. It will take time, but only if we address together the academic culture with the same curiosity and courage that we tackle our research questions will we bring the needed change.

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