Resilience as an Early-Career Researcher

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Introduction

Let's face it. Being a scientist is not easy. We cannot ignore the harsh and demanding realities of our career aspirations, or from life in general, which were collectively augmented by the COVID-19 pandemic over the past few years. Finding the balance between work demands and personal goals requires creativity and resilience. During this time AACR Associate Members have received unwavering support for their research and professional development, but they still need additional tools for processing the difficulties that accompany a scientific career.

Our conversations with the individuals that make up the Associate Members of AACR, led us to reflect on the question, what is the cornerstone for success in our scientific fields? Resilience. Resilience is not passively hoping for change or forcibly enacting it. Instead, it involves intentional adaptation and growth through adversity. By treating resilience as a learned discipline, we hope to share with the Associate Members how these skills and approaches may support early-career researchers at different stages of their career, from graduate school to postdoctoral positions and faculty transitions. We would like to highlight the feedback and expertise of Dr. Sharon Milgram, the Director of the Office of Intramural Training and Education at the National Institutes of Health, and her team for developing the Becoming a Resilient Scientist Series. At the end of this article, we provide additional resources that have been very helpful to the Associate Member Council members contributing to this article.

What is resilience?

Dr. Milgram states, "Resilience is defined by the ability to adapt and grow through adversity, particularly by navigating difficult challenges with awareness, intention, and skill. It is a set of attitudes and behaviors that can be learned and developed with education, self-reflection, and practice." Importantly, resilience is not defined by working to exhaustion simply because work is important. It is also not persisting no matter the circumstance or to suffer in a hierarchy. Resilience is an intentional choice to continue pursuing your goal, and this may require finding additional support or calmly deciding what works for you. Collectively, resilience is built as a function of people, process, and preparation.

The AACR Associate Membership encompasses graduate students, medical students, residents, and clinical and postdoctoral fellows. We also support the training of undergraduates and high school students with AACR Student membership. Each one of us is, has, or is planning to matriculate through various stages of higher education and career training, requiring great levels of expertise in our respective fields. With each transition, there may be many obstacles, with incredible risk of rejection, frustration, or personally-defined failure. That being said, since setbacks are inevitable, the question is not whether things will go wrong; the question is when, what, how often, how badly, or with what consequences. How can we mitigate those consequences, and react to them calmly?

The significance of supportive relationships in cultivating resilience

An integral component to building resilience is to identify and develop a community of people that you can turn to during times of stress. Many of us can appreciate, either from experience or the perspective of colleagues and peers, that the difficulties encountered during graduate or medical school training requires additional aid in many forms. There is incredible value in reaching out to those outside your

work and research; it is an active skill to seek support through networks composed of peers and mentors. Although it may be difficult to identify uplifting relationships, the easiest start is with small groups within the institution. No one can relate more to starting a training program than your classmates.

Emotional responses to challenging situations during training may cause one to retreat, which can present as avoiding the problem or not wanting to interact with peers. This might be a sign that we need to rely on our network for support, even more than usual. It is therefore crucial to identify and seek support from your community, including mentors, colleagues, peers, friends, family, or therapists. That support might be as simple as listening or can be insightful advice from mentors who have experienced similar situations.

For professional development, we talk about the role of having good mentors and sponsors to advance our careers, but these individuals can play an even more significant role, if their experience is sought for guidance. Mentors serve various roles during training in addition to advice. Identifying several mentors, including peer mentors, is recommended as a tool for resilience. Together, mentors and sponsors can advocate for you and provide alternative approaches in times of distress.

Additionally, many institutions have designated psychologists and psychiatrists with substantial experience working with graduate and medical students. Of note, there are specific administrative offices available at academic institutions identified to aid trainees. These professionals and offices, such as ombudsman offices, are ideally intended to be both objective and supportive for trainees in need of additional support or outlets. Additionally, academic institutions have dedicated offices for diversity, equity, and inclusion, that provide safe cultural spaces for students to develop a sense of belonging. Feelings of inclusion are extremely important in academic spaces and are especially needed for trainees from underrepresented groups, international trainees or those that identify as immigrants, trainees that are disabled, neurodivergent trainees, international trainees, and first-generation students. Being proactive in identifying professionals, especially those that have personal experience in our respective expertise, can mitigate the negative build-up of distress.

There are other realities to face by prioritizing higher education or additional training, such as financial or familial responsibilities. The choice to pursue professional training can cause financial setbacks for trainees, and despite some progress in making graduate and postdoctoral wages competitive, it can be challenging not to compare them to other career trajectories. While scholarships and student loans might be available, this can be especially hard for trainees with families or dependents during their training. Lower earnings are observed for trainees that seek additional postgraduate training, which fundamentally challenges the idea of family planning and resilience. Additional support should be considered for trainees that have families or dependents relying on minimal salaries with few fringe benefits. These challenges are the reason for some institutional resources, such as childcare, subsidized housing, and meal plans, were established to support trainees, and these can be considered to improve stability and security in pursuing higher education.

Overcoming feelings of inadequacy: Identifying the source of imposter fears

In our conversations with Associate Members, one of the most consistent obstacles for early-career researchers is simply ourselves. The goal of succeeding in higher education is often tied to fear, doubt, and even shame, due to overwhelming potential for failure and inadequacy. “Imposter syndrome” has become an increasingly popular label to describe the inability to accept success or the feeling that it is deserved and goes hand-in-hand with developing feelings of inadequateness for a role or position. Importantly, Dr. Milgram suggests using the term “imposter fears” since “syndrome” implies there is an illness. Taking away the idea that the feelings of inadequacy may not be chronic can help shift the mindset that a fear can be rationalized and potentially resolved. Acknowledging the fear is often the first step, followed by identifying where it comes from.

In moments where these feelings may be dominant, asking yourself questions can be very helpful. The dark humor behind phrases like “publish or perish” can be overwhelming, resulting in a domino effect of “What if…” questions and playing out scenarios of failure. Instead of falling into this spiral, the thoughts may be intercepted by acknowledging the negative feeling and identifying its source. Negative emotions, in addition to feeling scared, might include sadness, frustration, worry, jealousy, criticism, or rejection. One might be scared of failure, sad about a break-up, frustrated that experiments are not working, worried that graduate school isn’t right for them, jealous of a classmate for publications, criticized by their committee, or rejected from a grant review. Once the source is identified, then it becomes possible to take action to counteract its impact on your mindset and function. As stated, resilience is not the neglect of these emotions, but the individual choice to persist despite them.

Of the examples above, the sources of our imposter fears or thoughts might be tied to rational stressors (e.g. break-ups, experiments, others’ successes, grant reviews) or more intangible sources (e.g. future failure, career or research incompatibility, the intention behind criticism). Dr. Milgram said it's very important to understand the difference between a “big P” problem and a "little p” problem and learn to decipher which is the best course of action to respond appropriately. The rational setbacks and “little p” problems might be easier to get through by planning and implementing a short course of action, sometimes with venting, time, and space being the best remedy.

What we want to try to avoid are the “big P” problems or letting little problems become big ones. Big problems may require more consideration, including the self-compassion for what you are experiencing, the obstacle of self-advocacy, and sometimes additional resources, such as friends, family, or even therapy.

Personal compassion, advocacy, and awareness

We talk about things like self-compassion, self-advocacy, and self-awareness, and they simply come back to the question: How are we treating ourselves? To be a good friend and citizen, we can follow the idea of “treat others as you would like to be treated.” But to build resilience, we can also consider that we should treat ourselves as we would like our friends to be treated. If the people you care about were speaking negatively about themselves, being treated unfairly, or going through something challenging, you might tell them not to say that about themselves, to speak up with encouragement, or give advice. Resilience involves applying this level of care and compassion to ourselves in the face of difficulty. Working to exhaustion, embracing burnout culture, over-exercising, always saying “no” to social engagements, or spending hours doom-scrolling on your device are prime examples of situations that are the antithesis of self-care and resilience.

As a foundation, it may be best to start by finding your “why.” We write personal statements to get into a training program and outline a training plan for grants, but oftentimes this only scratches the surface of our motivations to pursue the uphill battle of a career in research. When it comes to troubleshooting experiments, sometimes redoing the work or modifying the variables might be sufficient to surpass the frustration. But when faced with the “big P” existential challenges of motivation in our defined success, it will likely take a bigger picture and “big P” plan to move forward. Dr. Milgram suggests looking at the situation, and asking yourself “What are realistic ways I can make change in my environment locally, regionally, and globally?” This consideration can reinforce your potential, not only to personally succeed, but positively impact the lives of others and those around you.

This approach can be incredibly empowering, enabling the confidence to vocalize purpose and leading to an important aspect of resilience: self-advocacy and assertion. There is an entire module on this topic in the Becoming a Resilient Scientist Series, involving topics related to asking for and receiving feedback, managing difficult conversations, setting boundaries, and communicating expectations.

As an early-career researcher, finding our voices can be particularly challenged by lack of knowledge or skills and the interdependence of our success on others. In the early stages, we are so focused on

learning, that inexperience can be debilitating. Self-compassion can change how we speak to ourselves under these circumstances, rephrasing “I am not good at this” to “I am not good at this yet.” With program and field expectations tied to our projects, this mentality can help build the understanding that no one is good at everything, but resilience involves the practice of navigating the struggle in growing and building those skills. Becoming more senior in our roles ultimately leads to us becoming more supervisory to others, and as a result, we become responsible for leading mentees in developing their own resilience in their training. As a trainee, the hierarchy can feel threatening, especially when there are letters of support, visas, or jobs on the line. As we build confidence by overcoming obstacles, our resilience becomes the backbone of advocating for ourselves under these circumstances.

The acknowledgement of our fears and growth of self-awareness do not mean that it gets easier; we grow to manage it, which requires the identification of successful coping mechanisms. This self-care needs to be healthy for both our physical and mental well-being. It doesn’t take reading too many headlines to know that stress, especially chronic stress, is bad for us. And it might not take too many years in professional training to realize that the canonical environments of this training make it all too easy to enable these feelings. There is a reason for early emphasis on eating healthy, getting good sleep, setting boundaries, or seeking therapy. They are all foundational habits that can create a routine that helps you take care of yourself and build a mindset that makes resilience second nature.

Summary and additional resources

In the face of adversity and challenges, resilience emerges as a driving force that enables individuals to navigate difficulties, recover from setbacks, and ultimately thrive. As a scientist delving into the realm of resilience, it is essential to recognize its significance in personal development and well-being. While this mindset may come naturally to some, it is a skill that can be cultivated and honed by everyone. In summary, here is a brief recap of some tips to help practice and maintain resilience:

- The Becoming a Resilient Scientist (BRS) series (https://www.training.nih.gov/wellbeing/brs/), developed by Dr. Sharon Milgram and colleagues at the NIH, provides lectures and discussions on building tools in resilience to navigate higher education.
- “The Mindfulness Scientist” by Dr. Christian Frezza emphasizes the importance of meditation in the professional development of early-career scientists (https://network.febs.org/posts/the-mindful-scientist).
- The Growth Mindset and the work of Dr. Carol Dweck addresses the mindset surrounding learning and knowledge in the face of failure (https://www.mindsetworks.com/science).
- In 2023, the Surgeon General Dr. Vivek Murthy addressed the epidemic of loneliness and a strategy for addressing mental and social wellbeing, coming out of the pandemic (https://www.hhs.gov/sites/default/files/surgeon-general-social-connection-advisory.pdf).
- Leadership on the Line: Staying Alive through the Dangers of Leading by Ronald Heifetz and Marty Linsky provides a framework for building skills as a mentor, which can enable the resilience mindset in navigating professional training and transitioning to leadership positions.
- Beasley HK, Acktins KV, Marshall AG, Garza-Lopez E, Wanjalla C, Scudese E, Kirabo A, Liu K, Hinton A Jr. A quick guide to networking for scientists. Trends Pharmacol Sci. 2024 Jan;45(1):1-4. doi: 10.1016/j.tips.2023.10.004. Epub 2023 Nov 13. PMID: 37968220.
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