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Overcoming (the Inevitable) Failures in Science

- February 25, 2021

“I am afraid that the opinion remains that the paper is not a strong candidate for publication…” Rejection. Failure. Almost everyone will experience a mixture of these during one’s lifetime. But for a scientist, this has become the norm of our existence: failed scientific experiments, rejected grants, and scathing remarks from manuscript reviewers. The one thing that is certain in academia, is that you will have many failures; what is not as certain is one’s response to such adversity. I hope this piece can give practical advice on how to overcome ‘failure’ and even potentially change our perspective on what failure is, with an emphasis on what steps young scientists, such as graduate students who are just beginning their journey, can take.

Turning your ‘negative’ response into a therapeutic one

Our typical response to rejection in science (and most other endeavors) is an initial combination of anger and/or disappointment, that can progress to self-pity, blaming the ‘system’, and depression. Though this can cascade and take you to a bad place emotionally, aspects of this response are quite therapeutic. Verbalizing your anger to colleagues or significant other(s) may help unload the emotional baggage that comes with rejection. Feeling sad for yourself can be used as an opportunity to decrease errant self-criticism. How long should you let yourself feel this way? The answer depends on the individual, but as a good rule of thumb is to not let the melancholy last beyond a week after receiving the bad news. I think the key here is to allow the emotional response to take its course and acknowledge that this perceived failure has happened so you can progress to coming up with a practical solution to your problem.

Framing a ‘failure’ into a ‘problem-based solution’ paradigm

After giving yourself some time to heal emotionally (or maybe as part of your healing process), you should change how you view your ‘failure’ from something that might make you angry and/or sad into a problem that has a practical solution. For this part of the process, I recommend meeting with your PhD mentor (yes mentors, this is part of your job title!) or any mentor/colleague who can give you encouraging yet constructive advice. During these meetings, try framing your ‘failure’ as a ‘problem,’ and then come up with a ‘solution’ for said problem. Here I want to provide an example of what a ‘failure’ may look like, and how framing it as a problem-based solution can help.

Your manuscript that was under review just got rejected. What do you do next? Framing this rejection as a problem may simply look like: ‘My paper was rejected, where can I submit my paper to get it accepted?’ Just simply making it understood that this is the ultimate objective can help you with some of the more nuanced discussions regarding the fate of your manuscript. Is the priority getting it published as soon as possible? Do you care about publishing in a similarly tiered journal to the one you just got rejected from? Do you want to/are you able to perform additional experiments related to your work that reviewers say may strengthen it? Creating these goal-oriented questions that you can answer with your mentor will allow you to focus energy on these new ‘progressive problems’ as opposed to dwelling on an issue you cannot change. This approach can work just as well with a colleague who knows your field and can provide honest and critical advice on your latest paper or grant. Going through this process will allow you to get back on track to resubmit a manuscript/grant or try an experiment that has not been working.

Changing a ‘failure’ mindset into a ‘growth’ mindset

Though the previous step of creating problem-based solutions will allow you to accomplish your goals, I also think it is important that we change our perspective on failure. Throughout the academic hierarchy, PIs, Postdocs, and Graduate students echo what is said around them that failure is the norm, which has

created a negative mindset that is far too prevalent in science. Instead, maybe we can start to view ‘failure’ as an ‘unwanted opportunity for growth’. This change of mindset can help us view our careers in science in a way that is more in line with how we (or at least I) naively viewed it while we were younger: a career of constant learning and growth. Performing more experiments to elucidate the mechanism of action you are proposing will help shed light on what is happening in the world and improve your science. Strengthening the logic and language of a grant proposal will allow a wider audience to appreciate your work. Small changes in attitude like these will make the path doable. Learning to change perspective early in your career will help you stay sane during the hard times and truly thrive over the long haul. Because although the path may be hard (as so many have and will continue to tell you), it is quite rewarding!

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Career Development ISEH Life as Scientist New Investigators

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I commend ISEH Bloggers for opening up this topic. I do believe it is in fact a reflection of many troublesome aspects of our general Western society where the pace of change is making it difficult for the human psyche to have time to integrate incoming information and feel able to respond to so many decisions so quickly. And this is just further compounded by the enormous increase in the numbers and diverse locations of the people that now constitute any single person's entire "community" -often not with the personal connections that were historically inherent in one's life even in the recent past.

So what can we do about it? My recommendations are as follows: Learn to develop and apply principles of logic and reproducibility, recognize that NOTHING is forever, identify colleagues that share those principles ideally with many backgrounds, embrace criticism and flexibility (as just another way to learn), and build knowledge and confidence in YOURSELF. Grants, publications, and what you actually decide to spend time on in your own scientific pursuits all need now to be marketed to different audiences. You can't have one without any of the others, but we are no longer in a one solution fits all world.

Yes - it is always disappointing to be "rejected". But most scientists of repute will tell you that their most important discoveries or contributions were not published in top journals or well received at grants panels. And this goes back even several decades ago. It is just now more apparent because of a current obsession with potential for translation in a general society that is driven by market forces. This does not mean it is all bad. Perhaps it means that we need more creative ways to bring the importance and rewards of

understanding scientific principles more foremost in every sector of our society - just as music has done.

Connie Eaves -Editor-in-Chief, Experimental Hematology (the growing landmark home of significant scientific advances in all aspects of hematology/hematopoiesis and the tissues where blood cells are born, live, die and have an influence).

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