

By Piotr Wasylczyk

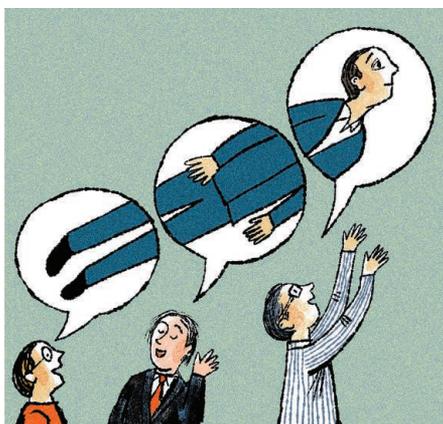
Three lessons rarely taught

After earning two advanced degrees, completing three postdocs, working in three countries, and finally reaching the stage when I am setting up my own lab, I realize that three lessons taught by three great mentors have influenced how I think about doing science. These lessons, each of which came at just the right time in my career, have helped me probe new intellectual territories and enjoy my work. Looking back, I appreciate the way that my mentors supported my development as a researcher and imparted valuable advice that still guides how I approach my work and career. Now, as I am moving into the role of adviser myself, I hope to be able to pass these lessons on to my current and future students.

Play around. The first lesson came from my Ph.D. supervisor in my home country of Poland. Although never explicitly voiced, he taught me that the lasers, meters, electronics, and other equipment were toys that we should play with: Open the box, tweak the knobs, and see what happens. While building laser setups, I gained hands-on experience in designing optics, mechanics, and electronics; and in soldering, welding, and machining various materials. **I now appreciate his trust in my beginner's skills and the chance to learn from my mistakes.**

Be sure to have fun. The next lesson came from my adviser for my first postdoc, in the United Kingdom. Having completed my Ph.D. and published some papers, I was starting to feel like a full member of the scientific community, and **I was becoming confident about what I knew and was able to achieve.** But I hadn't really thought deeply about why I was following the path I was on until **my adviser said to me, "It is only worth doing science if you are still having fun doing it."**

This notion prompted me to consider whether I was actually enjoying my research—and what I could do about it if I wasn't. With this new mindset, I gradually refocused my work over the following months and years. Instead of concentrating on planning and pursuing my next career steps and applying for grants, I spent more time exploring new research areas and intellectually wandering in search of attractive ideas. I dabbled in experimental photonics and microfabrication and ended up in smart materials and robotics. Changing research topics is always risky, but as I transitioned between disciplines, I discovered that novelty generates a wave of excitement and that gaining new perspectives unleashes great intellectual potential.



“Three great mentors have influenced how I think about doing science.”

Talking to other scientists, both young and mature, I see how difficult it can be to enjoy research. I feel privileged that my mentors encouraged me to play, have fun, and pursue joy, and that their support afforded me the opportunity to take risks. As for the robot, after 2 years of work, our team built a machine half the size of the world's smallest known insect, a male parasitic wasp. The success was gratifying, but I think I would have been happy with my decision to push my limits regardless of the results.

Now, as I put the final touches on the design of my new lab space, I plan to have a poster at the entrance to help remind my group—and myself—that **taking risks is the essence of research. It says, “Which research project would you start today if you were certain you would succeed?”** ■

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Find what suits you. The third lesson came on my first day in a new postdoc, this time in Italy. **My boss, who directed a few research teams, told me, “Look around at all the groups. See what they do, and find what suits you best. I believe in self-organization; everyone should do what they like, as only then will they do it with joy and passion.”** I was surprised to be offered this level of independence, but I followed his advice and ended up embarking on an ambitious project—designing and building bacteria-sized robots powered and controlled by light—that was quite far from my initial plans. I wondered what it would mean for my career if we failed, but I felt that this was the area I could explore, as my adviser advocated, “with joy and passion.”



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