No researcher is too junior to fix science

If young scientists plan to advance their careers before setting the system right, nothing will change, warns John Tregoning.

Thousands of researchers took to the streets last month to march for science. It is time to channel this energy into shaping scientific culture.

We all love to complain how the system for doing science thwarts ideal practice. Researchers reap more rewards for publishing flashy papers than for doing solid work, and the two do not always align. Everyone ends up chasing trends and asking the same questions. Broad, multidisciplinary research might achieve more in terms of advancing science, but it is harder to publish and finance. We end up sticking to the narrow path towards prestigious papers and big grants at the expense of worthier endeavours.

Why don't we change things? After all, science is uniquely self-regulating. The people who hire scientists are scientists, the people who allocate funding are scientists, and the people who decide what gets published are scientists. The tool we hold in highest regard is peer review: we are judge, jury and executioner.

One reason for stasis is that we scientists value consistency. The scientific process requires that variables be controlled as tightly as possible, even those that are unlikely to have any impact on an experiment. I know people who won't change the order in which they use pipette tips; they are unlikely to change scientific practice more broadly.

Another reason is that we are too busy just getting on in this system to pause to fix its flaws. Urgent grant submissions and experimental time points — tasks that reward the individual and have strict deadlines — will always win against some important but nebulous effort for the common good. It can feel as if those who spend their time on anything but their own projects and papers will find themselves scooped of the recognition required to win funding and resources.

Worst of all is the sad reality that those who most feel the need for change have the least power to effect it. The best time to fix the system, we tell ourselves, is after we have gained influence. If a PhD student shouts in frustration, are things going to change, or will she or he just be marginalized as a rabble-rouser?

This pernicious inertia persists at every rung of the career ladder — the higher scientists rise, the smaller seem the problems of those at the level below. Gaining a tenured post puts researchers in a position to make change, yet insulates them from much of what needs changing. The principal investigator tells the postdoc that finding a permanent position is easy compared to the angst of getting a grant. The postdoc tells the PhD student that defending a thesis is easy compared to the angst of finding a permanent position.

Evolutionary theory suggests a potential way out: reciprocal altruism. Science doesn't have to be a zero-sum game. The key is to use whatever

influence you do have to help your peers, and to trust that your peers will do the same.

I have reaped the benefits of this approach. One simple example was relinquishing a key authorship position on a paper to maintain a productive collaboration. At the time, I felt that I was losing out by not fighting hard enough in the struggle for credit. But the small sacrifice paid off. I continued to work with my co-authors, and they invited me to join them in writing what turned out to be a successful grant application. The immediate reward of prime authorship would have been less beneficial in the long run.

More broadly, as an early-career principal investigator, I have sought out a group of like-minded colleagues. We consciously try to be less self-centred and to support each other. In practice, this comes down to

small things that even those with pipetting rituals can handle: we read each other's drafts, accept our fair share of committee posts so that no one has an undue burden, and forward on relevant grant announcements. We each try to work a bit more towards a collective good: I happen to be enthusiastic about identifying broken stuff that everyone else ignores (burnt-out lights, squeaky doors, blocked sinks) and seeing that they get repaired. Other colleagues run seminar series, take the lead in teaching, interface between animal-care facilities and researchers, or manage the labs that require special biosafety precautions.

Reciprocal altruism can work more widely: mentoring postdocs or connecting students with careers outside academia, for example.

Don't wait on your senior colleagues, and definitely don't wait until you become one. Build a network of like-minded people. Identify something that doesn't work and fix it. It can be as small as a leaky tap or as big as peer review. Idealism can be catching.

Science will always be competitive, but too narrow a focus on your own advancement may come back to bite you. Academic promotions and appointments to senior positions require recommendations from colleagues. I'm sure I'm not the only one who has heard of ambitious acquaintances not being considered for promotion because they have stabbed too many people in the back.

Let's strive instead to stand together. One science historian called last month's science march unprecedented in its scale and breadth. That energy and optimism need not dissipate — it should be funnelled into making the system function better. The pay-off might not be immediate, but let's play the long game so that all can win. ■

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