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Making the scientific system more open and transparent

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SCIENCE AND SOCIETY

Making the scientific system more open and transparent

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Science needs to be a transparent process. The methods used and the results obtained should be easily accessible to and by all, not only to discuss conclusions, but also to compare and contrast results from different experiments. But it shouldn't just be the experiments that are transparent. How science is done, and how the scientific endeavor as a whole is being pursued, should be laid bare, open to scrutiny and criticism.

Throughout my postdoctoral research, my concerns about how science is being done have grown. In 2014, I became involved with a group of early career researchers in the Boston area concerned about the shape and efficiency of the scientific enterprise. We organized a meeting, the Future of Research Symposium, primarily to respond with a voice from part of the early career researcher community to calls from senior scientists for reform in science (Alberts, Kirschner, Tilghman, & Varmus, 2014).

Part of the goal of this symposium was to have an open and transparent conversation about the pressures facing junior scientists, which was why we chose to post all of our materials openly. In writing about the issues being faced prior to the symposium, we were careful to post everything where it could be accessible, such as introductory comments in the lead up to the symposium (G. S. McDowell, Krukenberg, & Polka, 2014; G. McDowell et al., 2014). It was also why we chose to record all of our sessions (see www.futureofresearch.org for materials), to promote open use of social media (see the Minority Postdoc Storify) and to publish our methodology (Mazzilli, Gunsalus, McDowell, Krukenberg, & Polka, 2014) and White Paper (with datasets) openly and transparently (G. S. McDowell, Gunsalus, et al., 2014).

In the discussions that arose during the symposium, and in the data that we accumulated, it was clear that a major problem junior scientists face in pursuing science is finding data to help them make decisions. How many jobs are available? What jobs are PhDs and postdoctoral experience good for, and if further training or experience is needed during that time, what should it be?

In a system where the number of postdoctoral researchers in the U.S. is unknown and estimated by a factor of two (Biomedical Research Workforce Working Group, 2012), trying to find data on where postdocs go is frustrating. This led us to make a call for greater transparency both as one of the major conclusions in our White Paper (G. S. McDowell, Gunsalus, et al., 2014) and also in a further call published openly, asking for institutions to take greater responsibility in both tracking career outcomes of graduate students and postdoctoral researchers, and to make that data openly available (Polka, Krukenberg, & McDowell, 2015).

This drive for data collection and transparency has inspired another Future of Research meeting in

Boston, to be held October 22-24th 2015. We are trying to find ways to collect more data about the diversity, shape and structure of the academic workforce and to find ways of disseminating that information. We are trying to include voices from not only amongst academic scientists, but labor economists, leaders in industry, and policy-makers.

In trying to make a transparent system, we need to have a frank and open conversation about the structure of our scientific workforce, how many graduate students and postdoctoral researchers we need or want and what we can do to improve the efficiency of science and to do this we need to include a variety of voices and perspectives about where we should be going. As part of discussing how we will get there, there will also be a whole session to the role early career researchers have in the publication system, including discussions of open publishing and transparency.

The information we gather and discussions we have during the meeting are not just to keep talking about the problems. The symposium will then inform activities for a Science Activism or Hack Day with ASBMB at the end of the meeting, where participants nationwide can try to find ways to solve these problems, and come up with workable products to gather and disseminate data. All of the materials are again to be made open and available for anyone to use and this year we will also by live-streaming the meeting.

We have called for a greater voice and contribution from early career researchers(G. McDowell & Polka, 2015) and I have been trying to lead by example, by making materials that I have submitted open and transparent (G. S. McDowell, 2015; G. McDowell, 2015a, 2015b). Exploring the shape of the scientific endeavor, and the data that I have increasingly seen has given me a renewed outlook on my own career and future, and how I want to be involved with the scientific endeavor (G. McDowell, 2015).

I already feel the benefits of becoming more open in searching for a more open and transparent research system. Not only have the efforts of the Future of Research group been replicated in New York, San Francisco and soon Chicago; myself and others increasingly find ourselves being contacted by senior academics, policy makers and scientific societies to make our voices heard and contribute to the discussion. As we go on, I have high hopes both for continuing to be open myself, and continuing to push for a more transparent system.

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