

A conversation with Professor Shirley Tilghman, May 19, 2016

Participants

- Professor Shirley Tilghman – Co-Founder, Rescuing Biomedical Research (RBR), and President Emerita/Professor of Molecular Biology, Princeton University
- Holden Karnofsky – Executive Director, Open Philanthropy Project
- Alexander Berger – Program Officer, US Policy, Open Philanthropy Project

Note: These notes were compiled by the Open Philanthropy Project and give an overview of the major points made by Professor Tilghman.

Summary

The Open Philanthropy Project spoke with Professor Tilghman of RBR for an update on an Open Philanthropy Project grant to support the organization's activities. Conversation topics included RBR's main focus areas, its new director, and the current status of discussions on biomedical research reform in the scientific community.

Hiring of director

RBR has hired a director, Christopher Pickett, to manage its day-to-day operations. Dr. Pickett has a PhD in biomedical science and was chosen for the role in part based on his experience as a fellow at the American Society for Biochemistry and Molecular Biology. During that time, he worked with Jeremy Berg, a member of the RBR steering committee and a former director of the National Institute of General Medical Sciences (NIGMS), on research-related issues.

Location

Initially Dr. Pickett planned to move with his family to Princeton, where RBR is based. However, former Congressman and President of the American Association for the Advancement of Science (AAAS), Rush Holt, another member of the steering committee, offered him an office at the AAAS building in Washington, DC. An office was available for Dr. Pickett at Princeton, but RBR felt that housing him at AAAS was preferable because there are few others at Princeton studying his issues. The science and technology policy group at the university's Woodrow Wilson School of Public and International Affairs mainly focuses on nuclear proliferation and climate change, which are not Dr. Pickett's areas of focus, while AAAS has a large policy group. Furthermore, his proximity to other policy and advocacy organizations in Washington will benefit RBR. Dr. Pickett communicates with Professor Tilghman weekly, and AAAS is willing to house him for at least two years.

Activities

Dr. Pickett has spent much of the last few months in conversation with thought leaders in the biomedical field. He began by speaking with each member of RBR's

steering committee to learn what issues they hope to concentrate their time and energy on. Dr. Pickett has also contacted several people in key roles at the National Institutes of Health (NIH), universities, industry, and nonprofit organizations. In doing so, he has begun to familiarize decision makers in Washington with both himself and RBR.

Although Dr. Pickett's role is mainly to facilitate the activities of RBR's working groups, his position is an important one. Apart from keeping the working group members focused and on schedule, he led the initiative to respond to a recent ruling on overtime pay that will result in salary increases for NIH postdoctoral fellows. As a full-time staff member, he can put in the day-to-day work needed to help RBR push its agenda more effectively.

Focus areas

Dr. Pickett has identified four areas of particular interest among members of RBR's steering committee:

- Publishing
- Funding young investigators earlier to help launch their careers
- Creating more staff scientist positions in research labs
- Transparency in graduate program outcomes

Publishing

Harold Varmus, another co-founder of RBR, together with Ronald Vale, Daniel Colón-Ramos and Jessica Polka, U.S.-based members of the steering committee, have expressed interest in focusing on the realm of biomedical publishing generally. Tony Hyman, a steering committee member based in Germany, is also interested in this issue. Through him, RBR can conduct comparative studies of policies in the United Kingdom and Germany versus the US.

This group has been working on increasing use of preprint servers in the biomedical sciences, an idea that has been discussed for a long time but has not yet gained widespread traction. Several preprint servers exist, but they tend to be underused. Using preprint servers for papers that have not yet been accepted for publication may help reduce the typically long delays before results from studies enter the public domain. Drs. Vale and Polka are leading on this issue and are likely the best people to consult about it.

Challenges and next steps

The major challenge in this arena has been convincing publishers to agree to review and print papers that are already in the public domain. Drs. Varmus and Vale hosted a meeting of members of the scientific community, the publishing community, and funders, the Howard Hughes Medical Institute (HHMI), which hosted the meeting, and NIH. Through this meeting, RBR learned that there is more consensus on the idea of preprint servers than it previously thought, and publishers are more open to the idea than expected.

Drs. Varmus and Vale are continuing to pursue this agenda by trying to bring key stakeholders into agreement. The next steps will be to determine which preprint servers are most effective, then spread word throughout the biomedical community that this is a good way to spread knowledge of their work.

Professor Tilghman believes that the main obstacle on this issue continues to be convincing scientific journals to allow distribution via preprint servers. It is unlikely that all such journals will agree to this because of differences in their business plans, but convincing a majority will build momentum. If the top three journals in the field (*Science*, *Nature*, and *Cell*) were to agree to this, it would be unnecessary to try to persuade other journals to do likewise, given the outsize influence of the top three journals. Another group that could be targeted is scientific society journals. Convincing these journals to agree to preprint distribution in the interest of helping the community would be a step forward, though it would not have the same effect as convincing *Science*, *Nature*, and *Cell*.

RBR's role

RBR is helping to change the conversation around use of preprint servers by bringing together disparate stakeholders, who had never talked about this issue as a group, for discussion of specific proposals. This is an example of how RBR can act as an organizer, identifying actionable issues and starting conversations.

[Since this conversation, the organizers have founded a separate group to work on this issue, called ASAPBio (<http://asapbio.org/>) and Jessica Polka has agreed to serve as its inaugural Executive Director.]

Funding young investigators

Steering Committee members Ron Daniels, Bruce Alberts, Judith Kimble and Dr. Hyman are working on a project with the aim of funding young researchers earlier so that they can launch their careers more quickly. This group is exploring a model from the European Research Council (ERC) that has been successful in Europe as well as the Canada Research Chairs model (CRC) credited with restoring the vitality of Canadian science. This working group is attempting to develop versions of these that would work in the US.

One sign of progress elsewhere is the fact that Jon Lorsch, the director of NIGMS, has proposed funding young researchers with Maximizing Investigators' Research Award (MIRA) grants, which consolidate funding for investigators with multiple grants. MIRA grants can help reduce the amount of time investigators must spend on grant applications. Dr. Lorsch's proposed approach would provide enough funding to last the recipients' first five years without requiring any additional grants. This development may be a sign that the work of Drs. Hyman and Alberts is already having an impact, at least within NIGMS, a major institute of the NIH. Encouraging other institutes to adopt the same model will be challenging, but establishing proof of principle should help.

Pay raises for postdoctoral fellows

Recently the US Department of Labor ruled that employers must pay overtime to any employee earning less than \$47,476 per year. This ruling may affect between 50 and 75% of postdoctoral fellows in the US. Afterward, NIH Director Francis Collins announced that the NIH would raise all postdoctoral salaries to \$47,476 or more per year. RBR applauds the decision by Dr. Collins and sees it as a victory, as it has recommended in the past that postdocs receive higher pay. Raising postdoc salaries means that fewer of them will be hired, which RBR believes is positive, and a raise to ~\$47,000 (from current standards of about \$40–43,000) is unlikely to exceed the budgets of most labs. RBR published a statement on its website in support of the move by the NIH.

Staff scientists

Several members of the RBR steering committee, including Professor Tilghman; Dr. Berg; Nancy Andrews, dean of the School of Medicine at Duke University; and Ron Daniels, the president of Johns Hopkins, are involved in another working group focused on increasing the number of staff scientist positions in research labs.

Core facilities

The group has chosen to emphasize the value of core facilities, which tends to be less controversial among scientists than the idea of replacing graduate students with staff scientists. However, there are many different types of core facilities, offering various prospects for scientists who want to run one. The working group intends to identify some good models for using core facilities to reduce the need for labor in individual labs. It is also considering bringing together several people who are known for running highly effective core facilities and having them collaborate on a business plan that shows how these facilities can reduce costs and increase efficiency and productivity. RBR believes that core facilities can do all these things, but no one has yet made a formal case for them.

On this issue, the constituencies that RBR most needs to convince are principal investigators in labs and university administrators. Help from administrators is needed to create career paths for scientists interested in managing core facilities. For these facilities to succeed, scientists must know that they can make a career out of managing them. However, universities have historically been reluctant to create these positions and commit to sustaining them; typically the facilities' existence has been contingent on others' willingness to pay for the services they offer. Leaders at the Broad Institute of MIT and Harvard and HHMI's Janelia Research Campus have emphasized the importance of identifying a respected career path for those running core facilities, one that is seen as a necessary part of the scientific enterprise. Scientists running core facilities must also be compensated properly, or it will be difficult to attract quality candidates to those positions. This is part of the reason RBR believes it is important to create a business plan for this project.

Some institutions that have invested in core facilities have already demonstrated the benefits of such an approach. Professor Tilghman is a board member at the Broad Institute and is thus able to observe what can be accomplished through greater

reliance on cores. The Broad Institute can do a great deal that cannot be done at a place like Princeton, for example.

RBR sees its role as bringing attention to a way of approaching science that can yield greater benefits to the scientific community and requires fewer individuals working in labs. In this way, the increasing complexity and specialization of technology can work to RBR's advantage, because it is becoming increasingly unlikely that any individual in a lab will know how to use all of its equipment. By encouraging the creation of core facilities, RBR hopes to open up positions for staff scientists at universities and thus reduce the number of trainees who must be recruited to individual labs.

Transparency in graduate programs

A fourth area of interest has been creating more transparency in graduate program outcomes. Dr. Pickett has been more involved in this group than Professor Tilghman. The basic idea is that information about the career outcomes for students from different graduate programs should be more widely available, especially so that prospective students could consider it when deciding whether to attend a particular program. The working group is considering a variety of approaches to promoting better collection and dissemination of this information.

Status of discussion of reforms within the community

Professor Tilghman believes that awareness of these issues has been growing, and more groups are discussing it. In support of this trend, RBR is trying to encourage universities to hold events similar to one recently hosted by Judith Kimble at the University of Wisconsin–Madison. RBR believes this kind of workshop can be a very effective way of expanding the conversation. A similar event will be taking place soon in Colorado, and Dr. Pickett and one or two steering committee members will participate, in an attempt to serve as a catalyst for further discussion.

RBR's role

RBR believes that the more progress that occurs independently of RBR's work, the better the result will be. Others in the community must explore these issues on their own terms, without RBR assuming any kind of ownership. RBR was pleased to see that a *Huffington Post* article by Dr. Collins, regarding the NIH's pay raise for postdocs, referenced the paper co-written by Professor Tilghman that led to the founding of RBR.

Other groups working in this space

Dr. Pickett is in close contact with the Future of Research Group, which represents postdocs. RBR supports this group, and its president, Jessica Polka, is on RBR's steering committee. The American Society for Biochemistry and Molecular Biology, which represents a large number of investigators in biomedical research, is also very aware of and active on these issues.

Organizational growth and development

RBR's current focus is on fundraising so that it can hold more meetings to further the conversation, including steering committee meetings and meetings of core-facility directors. Much of RBR's work so far has been done by teleconference, but occasionally it will be necessary to hold face-to-face meetings to help build camaraderie and ensure that everyone is in agreement.

[Since our conversation, the Kavli Foundation has agreed to fund a meeting of the RBR steering committee this month and a larger gathering planned for the spring.]

*All Open Philanthropy Project conversations are available at
<http://www.openphilanthropy.org/research/conversations>*