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Training for Today's Marketplace

Elizabeth Marincola and Frank Solomon

The number of biomedical research trainees in the United States has expanded dramatically over the past 20 years, but tenured positions—long a traditional destination for Ph.D. biologists—are declining (National Research Council Survey of Doctorate Recipients 1996). The American Society for Cell Biology surveyed its membership to differentiate real and perceived opportunities in the profession from the perspectives of cohorts at different stages of their careers. Although bias is created by selecting for active scientists, ASCB membership was chosen because it is quantifiable, current, and accessible.*

By many measures, the profession has become harder. The average time to obtain a Ph.D. rose from 4.4 years in the 1970s to 5.6 years in the 1990s. Before 1970, 14% of those who took more than one postdoc did so because they were unable to find a desirable independent position; in the 1980s, that reason applied to 39%. Before 1970, 70% of first-time job seekers obtained a full-time position in less than 6 months; only 36% in the 1980s reported the same success. Among established scientists, more than two-thirds claim that it has become harder to obtain funding over time. Before 1970, 71% of applicants for National Institutes of Health, National Science Federation, or American Cancer Society funding reported success on their first attempt; in the 1980s, that rate dropped to 43%. The only transition that has not become significantly harder is obtaining a postdoctoral position. Qualitative assessments reflect these trends. The cohort before 1970 indicates overwhelmingly (81%) that their jobs are highly satisfying (6 to 7 on a 7-point scale), whereas half (49%) of the 1980s cohort agree. Nine in ten of all respondents who oversee trainees indicate that obtaining a desirable full-time position in biology is more difficult than when they first sought one.

One solution may be to uncouple scientific productivity from an investigator's ability to attract and employ trainees.

This situation may arise because each principal investigator trains many times the single scientist required to replace him- or herself. This intrinsic instability could threaten the profession. Our system of concomitantly training scientists and producing science is a striking success. The implementation of research largely by trainees has produced extraordinary science and a generation of well-trained scientists. NIH peer review is the world model for research funding, and researchers in U.S. laboratories won more than two-thirds of all Nobel Prizes in Physiology or Medicine over the past 20 years. However, the separation is profound between these accomplishments and the anxieties of many scientists, especially students, postdocs, and those who train them. Many researchers perceive that science is thriving at increasing and unacceptable cost to those being trained. In strictly economic terms, it is in the interest of senior investigators to maintain the number of trainees, who work long hours in large numbers for little pay over many years in return for the chance to develop a satisfying career.

One solution may be to uncouple scientific productivity from an investigator's ability to attract and employ trainees. Of survey respondents, 61% endorse the creation of permanent research positions for scientists who would neither compete for grants nor train others. They would be supported through investigators who hold traditional academic appointments. For example, the Scripps Research Institute recently created a 3-year position for researchers whose contributions are essential to a research program. The majority of survey respondents who write grants cite the time they take as a major source of job dissatisfaction, which suggests that such a solution may be welcomed by many. Perhaps this different class of researcher has already emerged, embodied in the increasing duration of postdoctoral training. This career track could be recognized explicitly, legitimized, and nourished to become an element of the research enterprise. Part of the compensation for trainees is the prospect of a stable, independent position where they can do the work for which they are trained. When those prospects diminish, the work they perform merits compensation that more closely approximates its real value, as well as stability commensurate with age and experience.

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*The survey was conducted by Belden, Russonello & Stewart, Washington, DC; the complete data set is posted at www.ascb.org/ascb.