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A Japanese Perspective on Postdocs

Ken-ichi Arai and Naoko Arai

Postdoctoral researchers play an important role in the rapid dissemination of information and new techniques, fueling the advancement of science and the development of interdisciplinary fields. In the United States, working as a postdoc in different laboratories for 2 to 3 years is the main path scientists follow to become independent investigators. In addition to the advantages for the individual scientist, the postdoc system has been one key to the success of U.S. science over the past 50 years. And the benefits have gone far beyond academic labs. Researchers with postdoc experience continue to play influential roles in shaping the increasingly important biotechnology industry, for example.

Japan and other countries are now trying to capture some of the United States' research vitality for both the public and private sectors by introducing postdoc researchers. Japan's universities are based on small hierarchical departments, called "koza," in which a full professor directs the advanced education and research training of both undergraduate and graduate students. Other faculty members within the koza are tenured but not independent. And young scientists, upon earning their Ph.D., typically step directly from graduate student to junior faculty in the same koza.

"Japan has recently introduced postdoc researchers."

This system lacks flexibility and opportunities for mobility, as well as providing little independence for younger scientists. It was precisely to address these problems that Japan has recently introduced postdoc researchers. However, this step does not go far enough. There are no independent positions for young investigators that are equivalent to U.S. assistant professorships. A proposal to create an alternative to the existing hierarchical career path for scientists is now under consideration. It would allow young scientists to choose nontenured or tenure-track positions and apply for research funds to be distributed after a peer-reviewed evaluation. Supporting institutions would receive subsidies to cover their indirect costs. This evolutionary, rather than revolutionary, approach would allow individuals to choose between two parallel career paths.

Meanwhile, the situation facing postdocs in the United States must also be addressed. A mismatch between the rising number of postdocs and the limited number of academic research jobs has created considerable frustration and disappointment for young scientists. A 54% decline in the number of young scientists (under age 36) applying to the U.S. National Institutes of Health for individual-investigator research grants between 1985 and 1993, for example, shows the increasing amount of time young researchers now spend in postdoc positions before they achieve the status of independent investigators. This trend indicates that the postdoc system has fallen short of fulfilling its goal of training young scientists for independence at an early age.

Another challenge to the existing postdoc system comes from the increasing importance of goal-oriented research. This is particularly evident in areas of biotechnology involving genomics, proteomics, functional genomics, and high-throughput screening. In contrast to investigator-driven research, which is directed from the bottom up, goal-oriented research is directed from the top down and requires large teams. Policy-makers need to find ways to tailor the postdoc system, which played an important role in investigator-driven research, to suit an era of goal-oriented research.

At the same time, the growth of interdisciplinary and transdisciplinary fields should present additional opportunities for postdocs. In biomedicine, some of the most exciting work bridges basic discoveries and clinical applications. There are also the burgeoning fields of bioethics and law. Increasing links between government, university, and private-sector laboratories engaged in cutting-edge research should also provide new areas for postdocs to explore. In every case, the goal of these increased contacts should be the pursuit of research in an atmosphere of freedom and personal growth.

The authors are husband and wife. K. Arai is the director of the Institute of Medical Science, University of Tokyo, where he is also professor of molecular and developmental biology; he is also the president of the Asia-Pacific International Molecular Biology Network. N. Arai is senior staff scientist in the Department of Immunobiology, DNAX Research Institute of Molecular and Cellular Biology, Palo Alto, CA.