Grants-in-Aid and Basic Research

Reiko Kuroda
Professor, Tokyo University of Science, Research Institute for Science and Technology;
Professor Emeritus, The University of Tokyo

Since Dr. Shinya Yamanaka received the Nobel Prize in Physiology and Medicine in 2012, increasingly fervent expectation is being placed on the application of iPS cell research. Plainly, what Japan needs now is to merge its scientific outputs with industrial competitiveness. Concurrently, Japan will need to nurture the next seeds of great breakthroughs like iPS cells.

Everywhere, innovation is being called for. Unfortunately, however, new, world-altering technologies and products have not in recent years been materialized in Japan in significant numbers. Bitter voices are heard saying, “Well, we also have been developing similar elements ourselves.” However, it is of no use to just develop elements without the capacity to integrate and organize them. This capacity may be close to the original definition of “innovation,” which requires a combination of elements. Recently, I heard Mr. Hiroyuki William Saito, a second-generation Japanese American, say, “The Japanese are poor at team work.” Japanese tend to think of team work as being their special attribute, one that brought the Japanese teams victory in recent soccer matches. Thus, many may be baffled at this statement of Mr. Saito’s. In fact, “group work” is different from “team work.” A group is an assembly of people of a similar type, whereas a team is composed of people of different types. It is the integration and sublimation of such heterogeneity that spawns totally new values.

To nurture the next seeds of breakthroughs similar to iPS cells, creative research driven by the curiosity of researchers themselves is essential. Being creative and being innovative belong to different categories. The microwave oven might not have been invented by target-oriented research for ‘developing safe cooking methods for aging society’. Researchers working on microwaves came up with an idea of using the rotation/friction energy of water molecules for cooking. Green fluorescent protein (GFP) is now used in every molecular biology laboratory around the world. Wanting to understand why jellyfish glow, Dr. Osamu Shimomura made tremendous efforts that lead the discovery of the fluorescent protein. Subsequently, Chalfie and Tsien et al. cloned the protein, elucidated the mechanism of its fluorescence, and mutated the protein. Then at last, GFP has become a tool of molecular biology used by everyone.

Of course, “Type 2 basic research”, applied research, and development research are important. It is true that research does not always proceed according to what’s called the “linear model”, i.e., from basic, to applied, to developmental research.

In any case, the starting point is basic research. That does not mean basic research is superior to applied research. Basic researchers need to continually think about what their research can contribute to society. They need to perceive where they stand on an axis of time and space, and pursue their research accordingly.

What contribute most valuably to advancing basic research are Grants-in-Aid. Research based on researchers own ideas and plans may not necessarily confer benefits on society over the short term. However, such research will increase mankind’s wisdom, and may spawn leapfrog industrial developments in the future.

For six years from 2001, I served as a member of the Council for Science and Technology Policy, where I was involved in drafting Japan’s 2nd and 3rd Science and Technology Basic Plans. One area in which I devoted lots of energy was increasing the amount of the Grants-in-Aid; another was the introduction of a budget transfer system to carry forward unspent research funds to next fiscal year. I am very pleased to find out that the grant amounts have been steadily increased and that the application procedure was revised. In FY 2001, a system reform allowed JSPS to fund overhead cost as well, while in FY 2011, a Fund was established within the program to allow the multi-year use of grants.

My own involvement with Grants-in-Aid has not been limited to the policy-formulation side; of course, as a researcher I have also benefited from them, for which I’ve always been grateful. My first contact with Grants-in-Aid was in a later carrier stage than most researchers. It was interrupted once, but now I have begun reaping the benefits of these grants again. After receiving my PhD, I right away worked as a postdoc and then secured a permanent position in the UK, where I resided for 11 years. After returning to Japan, I found that it would be impossible to advance my research without Grants-in-Aid. So, struggling to fill out the unfamiliar forms, I applied for a grant. Thankfully, I was able to receive a number of grants under General Scientific Research (C), (B) and (A), Scientific Research (B) and other categories. With them, I was able to build the foundations of my research in such areas as DNA base sequence recognition, chirality recognition, and solid-state chiral chemistry. Then, I was selected as a leader of grant projects under

the Japan Science and Technology Agency's programs called ERATO and SORST. I am thankful for the opportunity those grants gave me to pursue my research wholeheartedly. Naturally, during the grant periods, I refrained from applying for Grants-in-Aid. After those JST-supported projects ended, I found myself struggling with a lack of funds to pay affiliated researchers and technicians, which continued until I reached retirement age at the University of Tokyo. I am now continuing my research at Research Institute for Science and Technology, Tokyo University of Science, building up my lab again thankfully with the help of Grant-in-Aid, though of modest amounts.

With the long spell of economic stagnation being experienced in Japan, weight is placed on target-oriented and problem-solving research that produces short-term outcomes. However, a long-term view should also be taken: Investment in basic science remains critical as it will be essential to undergirding Japanese society in the future. Accordingly, I pray for steady development of the Grant-in-Aid program.