Kakenhi Essay Series

Two Perspectives on Grants-in-Aid for Scientific Research —Applying and Screening

Sukekatsu Ushioda
President, National Institute for Materials Science

I applied for my first Grant-in Aid for Scientific Research in 1985 when I moved from the University of California to Tohoku University. At that time I knew almost nothing about this program as I had not been in Japan since I graduated from high school. I was, however, used to preparing grant applications for research projects as I had received grants from a number of US government funding agencies, including the National Science Foundation (NSF), National Aeronautics and Space Administration (NASA), Department of Energy (DOE), and Air Force Office of Scientific Research (AFOSR), while I was at the University of California. I began thinking about obtaining a Grant-in-Aid soon after returning to Japan, deciding to apply for a project to study surface physics using Raman scattering under the General Research A category. Back in those days, there was another grant category for instrumentation development, so I also applied under it for a project to develop a new type of ultrahigh resolution TOF (time of flight) electron spectroscopy. I was fortunate enough to be selected for both grants. In the following year, I was asked to join a research project "Surface as New Material" as a collaborating investigator, which was funded under the Grant-in-Aid category Scientific Research on Priority Areas. These grants enabled me to purchase most of the equipment I needed for advancing my research projects over a period of about two years. I remain grateful to the Grant-in-Aid program for allowing me to get my research at Tohoku University off to such a good start, especially as none of the needed research equipment was installed in the laboratory to which I was assigned.

As a professor, I spent 19 very happy years doing research at Tohoku University as practically all of the Grants-in-Aid I applied for were awarded. These grants were one of the things that made me happy to have decided to come back to Japan. After becoming president of the Japan Advanced Institute of Science and Technology, I was no longer eligible to apply for Grants-in-Aid. Instead, I encouraged the members of my faculty to take maximum advantage of these grants and offered them guidance on how to successfully apply. I told them that as their applications are peer reviewed, selection

would be recognition of their stature as a researcher within their respective scientific fields. On the other hand, I said if their applications are not selected, it would bespeak the fact that their peers regard their research as something less than outstanding. Now as president of the National Institute of Material Science, I take every opportunity to stress this point, and to reinforce it, I have established a policy that stops researchers who do not apply for Grants-in-Aid from seeking in-house research funding. An unfortunate consequence of this policy has, however, been a lower selection rate for Grants-in-Aid, as some researchers try to force through applications that are not properly prepared or justified. This dynamic is not an easy one to control.

When I was at the University of California, I wrote grant proposals that could be likened to a several-dozen-page review paper. In them, I would first provide an overview of the subject research field and, next, identify the research that needs to be advanced within it in. Then, I would describe the significance of pursuing a focused theme. At the end of the proposal, I would provide a reference list to demonstrate the veracity of the proposed research within the body of relevant literature. In contrast, it is much easier to file an application in Japan for a Grant-in-Aid as a relatively short application form is all that is submitted. Contrarily, this can make it difficult for the referee to get a good feel for the proposal's detailed contents. Also, since all Grant-in-Aid applications are filed in the fall of each year across the country, the referes must review literally tens of thousands of proposals all at once, which can impede the effectiveness of the screening process. Especially in the initial document screening, one referee must sometimes read and evaluate more than 100 proposals, rendering it difficult to check all the details of every one. Since, however, a number of referees will look at each proposal, I believe that in the end the result of this screening process is normally fair. Nevertheless, there are many cases in which, for example, the practicality of proposed experiments cannot be meticulously evaluated.

With funding agencies such as NSF in the United States, three or so referees review each proposal, which as I mentioned are written like a review paper, and give their evaluations along with comments. These comments are fed back to applicants, who are allowed to defend their proposals. This is similar to the referee process used when submitting papers to academic journals. What makes this applicant-friendly screening process possible in the US is that applications, like academic papers, can be submitted at any time during the year and that a program officer is assigned to handle each one.

When I was a member of the Grant-in-Aid for Scientific Research Committee at the Japan Society for the Promotion of Science, I suggested that Japan adopt a screening method like the one used at NSF. I was told, however, that that would not be possible because of the difference in manpower available to JSPS vis-a-vis NSF. While NSF had ~1200 administrative staff at its disposal, JSPS had only 17. I am not certain what the reason is for such a great difference. The US's GDP, like its population, is nearly twice that of Japan's. If Japan were to make use of its budget appropriations in a manner similar to the United States, there should not have been a 1200-to-17 ratio in the grant administration staff. As, unlike the US, Japan is not engaged in expensive wars, the government should all the more be able to make a larger investment in scientific research. Accordingly, I think JSPS ought to be bold in requesting the government for a widely expanded budget allocation.

Another significant difference in the research funding systems of the two countries is that in the US funding agencies compete just like applicants do. In Japan, however, JSPS and the Japan Science and Technology Agency are the only organizations that award grants for basic research. In the US, there are many such funding agencies. As mentioned, I myself was involved with six of them. These funding organizations vie with each other for the chance to support the highest quality research projects. In other words, a dynamic system exists for supporting excellent research that involves competition on both its supply and demand sides. This is one of the factors that invigorates research in the United States. In contrast, Japan is even witnessing a move to eliminate overlap on the research-funding side under a slogan "select and converge," which I do not believe to be an intelligent idea. While there is currently a plethora of programs for supporting top-down, result-oriented research, Grants-in-Aid for Scientific Research is the only system in Japan that allows researchers to propose their own ideas in a bottom-up fashion. It is my strong hope that JSPS will strive to expand and enhance the Grant-in-Aid program in the future.