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**A Career Cultivated by Grants-in-Aid**

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My specialization is experimental physical chemistry, a pursuit which requires medium-scale funding. To extract original data from such experiments, researchers must exercise ingenuity in handcrafting the devices they use. Indeed, it is a field in which it is only natural to build and assemble parts for experimental apparatuses. It is from this perspective that I have taken on this assignment of writing an essay on my experiences in basic research and attendant education.

After being hired as an assistant professor at Gakushuin University, I dropped out of my doctoral course in August. Just afterwards, I heard about the Grants-in-Aid program, and applied for my first grant. At that time, young researchers would mainly apply for funding under the Encouragement of Scientists grant category. I believe its upper limit was ¥500,000. Having fortunately been selected, I used the grant to buy a small vacuum chamber. Innovating parts and instruments for use within the chamber, I built a stainless steel apparatus for performing experiments with an array of objectives. After carrying out the experiments specified in my grant application, I continued to modify the chamber and used it to advance several other research themes. As might be expected, I no longer use the device, but have enshrined it on a shelf in my lab as the catalyst of my research career.

At the time I applied for the Grant-in-Aid, Prof. I, whose course I had taken at the university, gave me some good advice. As a document reviewer, he had probably seen my crudely devised grant application. Coming across him at a conference, the general advice he offered me was to make an effort to do my research in such a way as to accomplish it using a grant equivalent to just the same number of months as my salary. Further, if I were awarded the grant, to devote time and effort commensurate with its amount to that research. Having received that advice, I prepared future grant applications with a full measure of thought as to how I could most efficiently advance the subject research activities.

I had worked as an assistant professor for quite a long time; toward the end of that tenure I tried applying for a few large-scale grants. Selected for one in the category General Scientific Research B (currently Scientific Research B), I purchased a two-dimensional x-ray detection device, which had just come on the market. Just after that, I was hired as an assistant professor at Yokohama University and given my own independent research lab. At that time, it was the general rule that items purchased with Grants-in-Aid were the property of the host institution. However, my professor at Gakushuin allowed me to take my research equipment with me, saying that it was my “trousseau.” So I was able to use the x-ray detection device to start and carry forward my research in the new lab.

By the time I moved to Chiba University, the device had broken and was no longer operational. After having repaired it several times, at last it was no longer possible to obtain parts, so I had no choice but to discard it. I must have had a sad look on my face when an assistant professor in the lab said “Professor, why don’t you throw it away?” On my birthday a month later, she and some of the lab’s students came bearing a gift. It was a decorative plaque with the control circuit from the x-ray detecting device set upon it. A visiting researcher who was well versed in electronic circuitry, chuckled when he saw it, declaring the circuit to be a “classic.” So I hung it on my wall.

My most intensive involvement with Grants-in-Aid was over the years from 2005-2009, when I served as the representative of a Scientific Research on Priority Areas project. We considered the advent of “ionic liquid,” the theme of our undertaking, to mark a revolutionary turning point in fluid science. Catching the limelight as an environmentally harmonious medium, our project on ionic liquid was selected as timely theme. In prepare our application, we devoted a considerable amount of time and effort to devising a research plan and putting together a research group. Nevertheless, we received the following comment from one of the reviewers: “In selecting projects for Scientific Research on Priority Areas grants, the government decides whether it will make the large investment of funds requested based on the potential of the research to become Japan’s forte.” Those words remain etched in my mind. Looking back, I think we applied them well: Not only did we assemble a cadre of Japanese researchers from various related fields, but, of course, advanced the basic research—while making extensive progress in its development and application. I believe that our project made Japan one of the pivotal countries in the field of ionic liquid research. From that point on, we received consecutive grants under the Scientific Research on Priority Areas and then Scientific Research on Innovative Areas categories, which we used very effectively to foster young researchers and advance basic science of a nature that is unique within the international research community and gives Japan a special edge in scientific promotion for which it can take pride.

The project started with researchers in priority fields, who learned from and conducted joint activities with researchers in neighboring fields. When these results became manifest and jumps were made in the progress of our research, we were time and again greatly assisted by Grants-in-Aid. It would be no exaggeration to say that my career as a researcher has been cultivated by the Grants-in-Aid program.

The most attractive feature of Grants-in-Aid is that it allows researchers to do their research based on their own free ideas. Though the program extols bottom-up research, I'm concerned to see a gradual shift away from that premise. One such development is a trend toward selecting many projects that are "exit-oriented," short-term, and have easily obtainable results. Moreover, the use of funding is becoming more and more top-down oriented. With pressure put on them to be self-regulating, labs are forced to waste a lot of time and effort preparing a slew of documents to justify and explain their expenses. This is the same for both their research and educational activities. To address some of these inconveniences, an all-encompassing regulatory framework is created, incurring an even greater loss of time and energy.

However, there have of late also been some positive developments. As the result of deliberations by Council for Science and Technology and other competent authorities, a system is being created to streamline the carrying over of funds and a Fund is being established to support selected grant categories. I am glad that such systems are being created to facilitate the use of grant funds. In the lab where grants are used, we must, at the same time, be mindful to cast off the spell of over-self-regulation while liberating ourselves from resulting atrophy so as to optimize efficiency and produce long-sustained results.

The smallest Grant-in-Aid categories pay up to ¥5 million per program, while the largest pay several hundred million yen. Given this very wide gap, the various categories need to be compared and their contents reexamined. Projects selected for large-scale research funding may, I believe, be infused to some degree with policy value. In contrast, the smaller categories (i.e., Scientific Research C and Grant-in-Aid for Young Scientists B) are of great importance in bolstering the foundations of Japanese research and germinating new research fields. Under the current circumstances when university labs cannot be maintained using just their allocated operating budgets, these Grants-in-Aids also go along way in providing postgraduate education. The selection ratio in these categories is presently just a little over 20%. In addition, the category Challenging Exploratory Research should be strongly recognized as providing opportunities for researchers to take on challenging themes, ones that help to sprout new fields of both basic and applied research. In FY 2010, the selection rate for this category was only 10%. I'd like to see the rate raised to around 30% for all three of these categories.

I have heard that a large increase in the government's FY2011 budget for Grants-in-Aid has been approved, and that the additional funds will go into those grant categories that support small-scale research and that germinate new research fields, and that a Grant-in-Aid Fund will be established. I am delighted to learn about these new milestones. However, system reforms should not stop here, as I'd hope it would be only natural for Japan to continue advancing them as a nation whose roots are steeped in science and technology.