

## Some Thoughts on Grants-in-Aid for Scientific Research

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When I was a research associate, I was delighted to receive a Grant-in Aid for Scientific Research (Kakenhi) for the first time, but even my memories of that experience are now quite dated. Of course, as a young researcher, I had a tough time piecing together enough research funding. I clearly recall that on at least two occasions, I submitted what I thought to be an impressive grant application, only to receive a rejection notice. I had become discouraged, but the following autumn I received notice that the initially rejected application had been approved as an alternate. In both cases, I ended up filling out application forms for grants around the same time I prepared my next grant application. My research has been funded almost entirely by Kakenhi. In recent years in particular, I have been able to make progress in my research with support from Kakenhi for my project in the Specially Promoted Research category, and I am sincerely grateful for that.

The Ministry of Education, Culture, Sports, Science and Technology (MEXT) and the Japan Society for the Promotion of Science (JSPS) have taken a variety of measures to ensure that Grants-in-Aid for Scientific Research can be harnessed to support undertakings in basic research. That said, I would like to use this opportunity to share some of my thoughts on the Kakenhi program as it relates to the context of research in the life sciences.

The Kakenhi program was originally designed with the intent of *subsidizing* research projects expected to demonstrate outstanding results within a sufficiently equipped research setting. Accordingly, grant funding cannot be applied to the purchases of fixtures and equipment that do not contribute to the projects being subsidized. In years past, it was possible to conduct research at least on a minimal level even without Kakenhi because researchers still had access to budget funding for

lecture-related expenses. That in itself had significant value because it helped provide wide opportunities for research. However, recent years have witnessed a reduction in Management Expenses Grants given to National University Corporations. This, together with the shift toward the utilization of a competitive funding system, has meant that many universities and research institutions face an extreme scarcity of funding for their routine, everyday operations. Because virtually no Management Expenses Grants are allocated anymore, it is difficult if not entirely impossible to pursue research without Kakenhi or other competitive funding. In other words, subsidies are no longer used as subsidies but as research funding itself. Further, to cover the outlays for the ordinary operations of graduate schools and research institutions, indirect costs associated with competitive funding have gained significance.

On the surface, the notion that Kakenhi is primarily a means of support for independent research seems reasonable enough. In reality, though, this idea has many drawbacks. For instance, the acquisition of competitive funding can have a major impact on the administrative affairs of a research institution. Consequently, to acquire the funds needed for their own operations, some institutions face growing pressure to recruit researchers that have already obtained research funding or can be expected to obtain such funding in the future. This in turn has fueled a tendency to recruit researchers engaged in popular fields that are more likely to attract financial assistance, and appears to be undermining the research quality and content that universities should otherwise be pursuing. These factors have had a significant influence on younger generations of researchers, encouraging many to opt for research on currently fashionable themes and fostering the impression that research on new and unknown themes is too difficult. In the end, this trend could have the effect of creating a new generation of researchers that are increasingly conservative and unable to generate new ideas or insights.

Another drawback is the strict requirement that equipment purchased for research on a given theme not be utilized by others because that would be deemed a use for unintended purposes. From the perspective of effectively utilizing available research resources, this requirement has a negative impact. Modern research in the life sciences demands an array of analyses. Although the tools and instrumentation used in those tasks are not that significant in their scale, without access to such resources, research progress in this field is frequently delayed and research papers left

unfinished. If principal investigators were to source all the equipment required for their respective research projects on their own, they would need considerably large amounts of research funding and would have to devote a sizable share of their time to the task of obtaining that funding. As indicated earlier, if the amount of funding allocated to shared research facilities decreases it becomes essential that younger generations of researchers have access to an abundant inventory of shared equipment if they are to effectively pursue undertakings in independent research. By contrast, progress in a given research project may render unnecessary certain equipment that was initially required and purchased for the purposes of that project. Equipment purchased with Kakenhi may be utilized for other, non-Kakenhi-based research provided that does not interfere with the execution of the Kakenhi-subsidized research project. I would like to see this improved approach adopted by other research assistance frameworks as well. This point is always brought home strongly to me every time I visit a research institution abroad and see how efficiently they utilize their large inventories of equipment through sharing-based arrangements.

In return for the introduction of indirect costs associated with competitive funds, some universities have even eliminated the facility upgrade budgets they previously allocated to their faculties and departments. In fact, failure to make needed equipment upgrades has become the status quo at many smaller universities. Efforts in cutting-edge research naturally require an array of large and expensive pieces of equipment including high-performance microscopes, mass analyzers, and sequencers. However, keeping all of this equipment running smoothly also demands outlays for routine maintenance. Furthermore, depending on the competence of the operator, these pieces of equipment can demonstrate broad deviations in performance. From an institutional standpoint, it is unreasonable to entrust the responsibilities of operating and maintaining large and expensive instruments of this kind to the individual researchers that have them installed. Having the ability to employ highly qualified maintenance engineers on a full-time basis is also key. To that end, in addition to the present Kakenhi for independent research, I believe it would be nice to have a research grant framework that also helps research institutions promote the development of their research environments.

However, and especially in terms of the absolute amounts allocated for projects in the Scientific Research category, the Kakenhi framework in its current form has been marked by shortfalls in funding and exceptionally low grant approval rates. Doubling

or tripling the current total in such funding would significantly transform the research climate at many universities and other institutions and arguably enable these institutions to devise ways of finally harnessing their budgets for indirect costs.

In recent years, Japan has witnessed a nationwide acceptance of the expectation that research produce results that can be readily utilized for practical applications. This trend is undeniable. But don't researchers sometimes actually tie their own hands based on mistaken or one-sided assumptions? I myself am of the view that researchers do not necessarily always have a firm conviction that their research must be of some value or benefit. I think it important that we share in the awareness that the growth of intellectual assets contributes to the future potential of humankind. However, many young researchers assume they will always be required to promptly produce results or benefits. Hence, as if trying to give a model answer during an employment interview, most young researchers automatically say that they "want to engage in research of value" without really thinking the matter through. We live in a social climate where being beneficial or of value often seems synonymous with having the products of one's work immediately commercialized. Society has a certain awareness or expectation that only the historical record can tell us what will be of true value to humankind in the future. I feel that researchers today are being called on increasingly to accept that perspective.