

Grant-in-Aid Support for My Research on Ascidian Development and Animal Evolution

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I'd like to convey my experience with Grants-in-Aid for Scientific Research. Over a period of more than 30 years, I have been using the marine invertebrate ascidian (sea squirt) in conducting research on molecular mechanisms of embryogenesis in an effort to elucidate the development and evolution of animals. As ascidians are a minor life form, I could not have conducted and advanced basic research on them without the support of Grants-in-Aid. When I was about 30 years old, I carried out my research in a completely independent environment at Kyoto University. It was at a time when ascidian research was only just getting started, so I had no mentors in carrying out my work. I was, however, blessed to have many talented graduate students around me, with whom I advanced my work, yielding a variety of findings and discoveries on the development of animals. Then in 2002, the genome was decoded for the *Ciona intestinalis* through a joint research project between the US and Japan (it was the seventh animal genome to be decoded). This milestone prompted the international expansion of research on the gene regulatory network of ascidian development.

The ascidian (or urochordate) has a close relationship to vertebrates, including ourselves. Over 100 years, it had been debated which—urochordates or cephalochordates (lancelet amphioxus)—are most closely related to vertebrates. After decoding the ascidian genome, that of the lancelet amphioxus was decoded in 2008. As a result, it was concluded that the cephalochordate is the closest ancestor of chordates and that the ascidian and vertebrate comprise a sister group. This research, which I conducted over that period, was almost entirely supported by uninterrupted Grants-in-Aid, including selection for funding under the “Specially Promoted Research” category. Especially, the ten years of Grants-in-Aid support for our genome-related research allowed us to advance our work meticulously from relatively wide perspectives.

When attending international conferences and on other occasions, I was often asked by researchers of other countries how I was able to secure so much grant support in Japan for ascidian research. It would have been difficult to obtain grants for such research in other countries. Of course, there were various reasons for this disparity. However, in Japan I was not the only ascidian researcher to receive Grants-in-Aid; many other

ascidian researchers were also given such support. I believe one factor underpinning this is the selection system for the Grants-in-Aid program. That is, in Japan the proposal screening process for Grants-in-Aid is carried out entirely by researchers themselves. Whether the subject of a proposal be ascidians or planaria, many have been selected when judged by a group of peers to have potential to yield results in the field of developmental biology. This would not be the case if screening were carried out under a research funding system in which grantees are selected based policy agendas.

Over recent years in Japan, there has been an increase of top-down funding for large-scale, mission-oriented research. It is only appropriate that such research has its own tailored screening system. However, to cover research in all fields of the humanities, social sciences and natural sciences, I believe that the present Grant-in-Aid screening system, under which researchers themselves evaluate proposals, to be desirable. I have heard people say that this screening method is not well suited for research in new fields. However, among various options that take into account how to grasp and respond to globalization, I believe that continuing the current screening system to be best for enhancing the excellence of basic research, which has become Japan's tradition.

I'd like to divert a little now to the opportunity I had to work as a senior program officer in JSPS's Research Center for Science Systems from the spring of 2007. The position carried with it heavy responsibility, which I was happy to have shouldered without complication over my 3-year tenure. That three years saw the Center's work evolve dynamically. I recall that in FY 2007 much time was spent discussing how to improve the screening system, including such details as the application format. In FY 2009, our attention turned to the structure and content of the Grants-in-Aid themselves. That discussion evoked a strong awareness of the historical transition of the Grant-in-Aid program to present. As a legacy, some Grants-in-Aid are still being screened by the Ministry of Education and Science (MEXT) and others by JSPS. On the JSPS side, different screening systems are in place for the Specially Promoted Research and Scientific Research categories, while different application procedures are provided for the categories Scientific Research S, A, B, C and Grant-in-Aid for Young Scientists A, B. Some other grant categories have fallen out of use. This is the result of having from time to time sifted out problems that occurred and attempting to improve the Grant-in-Aid system. Looking back, however, with an untainted eye, the system appears to be overly complex. From a basic perspective of awarding grants to advance research, it would be good to simplify the system yet a little more. A review of the grant categories and sub-categories will begin in FY 2013, and work has begun in the run-up to it. I hope this movement will begin a discussion somewhere on the state of the Grants-in-Aid program five to ten years in the future.