

My Experience with Grants-in-Aid for Scientific Research

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After being asked to write this essay, I reflected on my experiences and realized that I didn't receive my first Grant-in-Aid for Scientific Research (Kakenhi) until past the age of 40. For around 10 of the ensuing 20 years, I was almost entirely dependent on that source of grant funding for my research: five years for work in Grant-in-Aid for Scientific Research on Priority Areas, and another five years for work in Grant-in-Aid for Specially Promoted Research. My experience with Kakenhi has been relatively short because up to the age of 40, I had spent much of my research career in the United States. The opportunity to pen this essay reminded me of my experiences with the acquisition of research funding in the US and inspired me to share some of my impressions about Kakenhi and the support they provide to younger researchers in particular.

I spent an extended period pursuing research in the United States for a variety of reasons. In my third year there, I was fortunate to be awarded an extremely generous fellowship that took care of my income and research funding needs over a period of eight years: three as a postdoctoral researcher and five running my own lab. This fellowship (the Lucille P. Markey Scholar Award) was extended through a trust established to utilize the entire fortune (\$500 million) left by Lucille Markey for the advancement of biomedical science within 15 years following her death, as stipulated in her will. Lucille Markey was from a wealthy family that had owned several Kentucky Derby-winning racehorses. Each year, the trust foundation selected 16 candidates from among applicants in a range of biomedical science fields and awarded fellowships to a total of 113 researchers over its 15-year duration. Most of the awardees are currently active in the US and Europe as leading researchers in the medical and biological sciences. This fellowship eventually earned acclaim as a model for bridging funds that can help recipients cover their research expenses as they move from postdoctoral positions into careers as independent researchers (according to a 2006 report by the National Research Council). At the time, my research might have been perceived as

unorthodox by some in the mainstream immunological research community. Hence, when I received notice that I had been awarded a fellowship, I was both elated and at the same time impressed by the tolerance that science funding in the US shows to non-mainstream topics. I continued with my research work in the US for seven years but decided to return to Japan before my fellowship expired. The reason was that the Japan Science and Technology Corporation (now known as the Japan Science and Technology Agency, or JST) had launched Precursory Research for Embryonic Science and Technology (PRESTO) and had accepted an application I submitted in reply to the research program's first open recruitment drive. My understanding is that PRESTO was an idea that Dr. Susumu Tonegawa proposed after he had received the Nobel Prize, and was established to assist young researchers in achieving their independence. In my case, these sources of US and Japanese research funding for aspiring researchers enabled me to go independent, concentrate on my research even with a small team, and stay engaged in that research for the decade through my thirties. Looking back, I consider myself extremely fortunate.

Kakenhi is designed to support not only basic and applied research but also the advancement of creative scientific endeavor. Of course, some may question whether creative scientific endeavor actually costs much money. At least judging from the historical record of medical biology, many times novel discoveries and inventions apparently do not demand large-scale injections of research funding. However, as these accomplishments gain broader recognition and spur rapid advances in research, it seems that they become increasingly competitive and demand funding on a fairly large scale. It may be that many of the latest, major discoveries and applications—such as iPS cells or micro-RNA—did not demand heavy infusions of research funding at the outset. As one old adage has it, the difference that separates the genius from an average person is the quantity of ideas, not their quality. If that's true, then advances in creative science arguably demand that the underlying research benefit from a certain measure of broad-based, long-term funding even if the outcome or "yield" seems poor. Conversely, it is also probably necessary to expand shared research equipment and staffing at shared research facilities to reduce the amount of research funding required by individual investigators for their own research. In view of the unexpected and unpredictable aspects surrounding important scientific discoveries and inventions, I think it desirable that our frameworks for assistance have enough latitude or capacity to provide research funding to research undertakings that show hidden promise even if they lack maturity.

As in the past, young researchers still face many hurdles even now when it comes to gaining independence and starting up their own laboratories. Judging from what I've observed and

heard from my immediate peers, researchers striving to start their own labs rarely receive enough funding to hire needed research staff or purchase new lab equipment. Anyone can expect to face hurdles with a new startup. While personal ability or resourcefulness may factor significantly in surmounting those hurdles, I believe the current Kakenhi framework also has room for improvement. Making Kakenhi more competitive will not have the effect of stimulating research. For example, when accepting grant applications, how much consideration is given to whether the applicant is starting up his or her own laboratory? While amounts of research funding are one matter, can financial assistance be extended on a continuing basis over the roughly five years or so that the typical new research project needs on average to get off the ground? Assuming that research outcomes or progress are evaluated with rigor and fairness, isn't it rational to extend assistance on a continuing basis to research projects on the same theme if evaluations have already accorded them high marks? I would like to see the Kakenhi framework further expanded and opened to more investigators regardless of whether their field is in the humanities, social sciences, or natural sciences.