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Individual versus Group Research

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I have been researching algae since my university days. Some 40 years have elapsed since then. From about 3 billion years ago, blue-green algae (cyanophyta) are said to have set into motion the history of life on Earth. Carrying out photosynthesis, they absorbed the carbon dioxide that filled the atmosphere and produced oxygen. Today as well, blue-green algae function to create the Earth's atmosphere and its ozone layer, while creating an oxidative environment that gives birth to various aerobes—expanding the size of the ecosystem by a trillion times. Furthermore, the oxygen produced by algae dissolved in water oxidizes divalent iron ions and yields ironstone. Also being a major source of petroleum in the Middle East, algae have played an instrumental role in not only the history of the planet but also of the human race.

My research on algae began with observing, identifying and classifying algae species in the natural environment. I, then, expanded it into species differentiation. At that, I received my doctorate and went to work at the National Institute of Environmental Studies (then, National Institute of Environmental Pollution Research). It was the red tide, a serious societal problem at that time, which most likely prompted me to choose this research topic from among others. Elucidating the cause of the red tide would require conducting isolated cultures of the causative algae, establishing a pure culture procedure, and determining the algae's physiological characteristics. Giving impetus to this initiative was the university experience I had in conducting pure cultures of various algae species.

A project was launched and I was one of its members, whose job it was to carry out a component of the research. Our project leader, a man of immense erudition, was able to advance the group's basic research by allowing us, the team members, to pursue our research based on our own free ideas, while discharging the project's obligations to society. As the project yielded results after a few years of implementation, we applied for its first Grant-in-Aid. I shall never forget the joy I felt when we received an acceptance notice for that grant—and I had finally been recognized as a full-fledged researcher.

After that, I would be a member of various projects that received Grants-in-Aid, including on the evolution of lepidodinium chlorophorum, toxicity in blue-green algae, and species of charophyceae facing extinction—in all of which I carried out basic research while pursuing my own free ideas. After becoming eligible to lead a project myself, I could concentrate my efforts on one endeavor. Upon transferring to the University of Tsukuba in 2006, I challenged anew applying for Grants-in-Aid.

While at Tsukuba, I've served as the international leader of a project under JST's Special Coordination Fund for Promoting Science and Technology and also as the leader of a project on algal fuel under the Climate Change Policy Project of the Environment Ministry. Over the latter project, which started as basic research, gathered menacing clouds when the ministry's Project administrator was changed in mid-stream. Now, pressure was placed on the team to produce practical results. All of its members, however, perceived that project on algal fuel to still be at a stage of basic research and wanted to push forward in implementing it as such. Thus, we took up the challenge and applied for a Grant-in-Aid under the category Scientific Research (A), and were selected. Ensuingly, this research advanced to a project under JST's strategic basic research CREST Program; in 2011, it went on to be implemented as a validation research project within the Special Global Strategic Zone at the University of Tsukuba.

While employed at the university, I was given the opportunity to work in a collateral position at JSPS's Research Center for Science Systems as a senior program officer of its Interdisciplinary and Frontier Sciences Group. In that post, I learned a lot about the various Grant-in-Aid categories and their application screening systems. Fundamentally, Grants-in-Aid support research carried out based on the free ideas of individual researchers; however, some projects supported under Scientific Research (A) and (S) have a strong image of being group implemented. When it comes to Scientific Research (B), there are more than a few projects that can only be thought of as group research as they may have 18 or more collaborating researchers participating in them. What's important in this light is the need to perceive Grants-in-Aid as not only covering individual researchers; irrespective of the amount of funding, there are research topics that can only be advanced by putting together a research group. This inclination is particularly pronounced when it comes to interdisciplinary research. Our project on algal fuel is precisely that sort of group research. That said, group research must be carried out while respecting the free ideas of each researcher making up the team. The leader has the responsibility of advancing the project both systematically and scientifically to ensure that the work doesn't slip into disarray.

There had been a grant category for group research within the Grants-in-Aid system, but was later eliminated. While working at the Research Center for Science Systems, I wanted to discover the reason why and process by which that group category had been abandoned. Lamentably, I was unable to do so. Nevertheless, there are without a doubt topics that cannot be significantly advanced unless the research is implemented by a group. I must ask, therefore, if it won't be important to consider reinstating a dedicated grant category for supporting group research in the future.