

**[Grant - in - Aid for Scientific Research on Innovative Areas(Research in a proposed research area)]**  
**Biological Science**



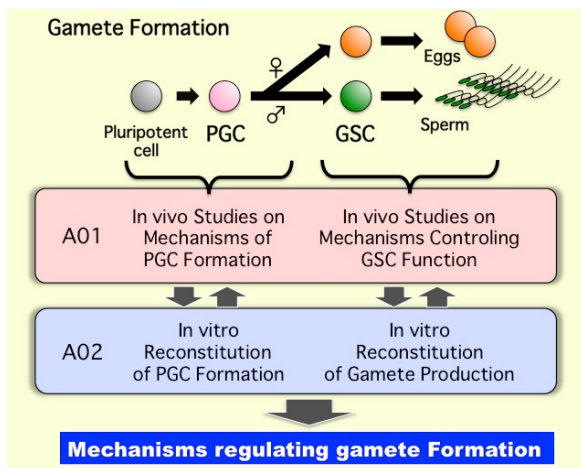
**Title of Project : Mechanisms regulating gamete formation in animals**

Satoru Kobayashi

( National Institutes of Natural Sciences, Okazaki Institute for Integrative Bioscience, Professor )

**【Purpose of the Research Project】**

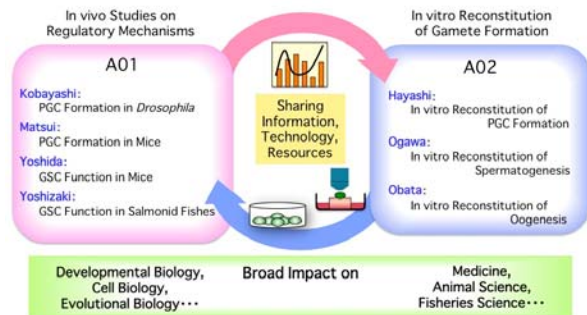
Gametes, represented by the male sperm and the female eggs, are specialized cells that produce progeny and transmit genetic material from one generation to the next during sexual reproduction. The initial step in the developmental processes leading to gamete formation is specification of primordial germ cells (PGC). PGC eventually migrate into the gonads, where they differentiate as gamete stem cells (GSC) to continuously produce gametes. How PGC is specified, and how GSC function is regulated, however, are long-standing questions in biology. In this research project, we would like to address these issues. In particular, we will focus on cell-autonomous mechanisms regulating PGC formation and GSC function conserved among animal species. Furthermore, we will try to reconstitute the developmental processes leading to gamete formation in vitro.



**【Content of the Research Project】**

This research project consists of two working groups (A01 and A02) and seven researchers, whose contributions have been outstanding. A01 aims to find the molecular mechanisms regulating PGC formation and GSC function by in vivo studies. Collaborating with A01, A02 will develop new techniques for reconstituting PGC formation, spermatogenesis, and oogenesis in vitro. These techniques enable us to perform a

long-term live imaging of gamete formation and a genome-wide gene expression study. The interaction between A01 and A02 is shown below.



**【Expected Research Achievements and Scientific Significance】**

This research project will open the door on a new understanding of common mechanisms regulating gamete formation through collaboration among researchers in basic and applied sciences using a variety of animals. Hence, this project will greatly contribute to a variety of research field, such as basic biology, medical science, animal science, and fisheries science.

**【Key Words】**

Common mechanisms regulating gamete formation: mechanisms regulating PGC formation and GSC function conserved among animals. In this project, we will focus on common genes and genetic networks governing gamete formation.

**【Term of Project】** FY2013-2017

**【Budget Allocation】** 1,157,200 Thousand Yen

**【Homepage Address and Other Contact Information】**

<http://www.nibb.ac.jp/adventures-in-germlin-e-wonderland/>  
skob@nibb.ac.jp