



Takafumi Fujimoto

Associate Professor

Division: Division of Marine Life Science

Chair: Aquaculture Genetics and Genomics

E-mail: fujimoto@fish.hokudai.ac.jp

Education History

B.Sc.: Hokkaido University, Faculty of Fisheries (2000)

M.Sc.: Hokkaido University, Graduate School of Fisheries Sciences (2002)

Ph.D.: Hokkaido University, Graduate School of Fisheries Sciences (2005)

SUBJECT: Developmental Biology of Teleost Fishes, Breeding and Genetics in Aquaculture

SPECIALITY: Reproductive and Developmental Biology, Genetics and Cytogenetics

CURRENT RESEARCH TOPICS:

We can find some species with atypical reproductive mode, including clonal reproduction, gynogenesis, hybridogenesis etc., in nature. The molecular mechanism of atypical reproduction, however, is still unclear. The atypical reproduction will be useful tools for genetic improvement and seeding production for aquaculture. Thus, we try to clarify the mechanisms using loach *Misgurnus anguillicaudatus*, including a clonal population with a gynogenetic reproductive lineage in nature where bisexual reproduction mode is normally observed, and we would like to apply the mechanism for producing genetic identical gametes for seedling production in aquaculture. Furthermore, we induce artificial hybridizations using Cyprinid and Salmonid fish to examine the reproductive characteristics of the resultant hybrids. On the other hand, we also develop techniques of cryopreservation for gene banking and reconstitution of genotypes from cryopreserved germplasm.

Second, we also develop techniques of gamete production using chromosome set manipulation and developmental engineering. Gametes are derived from germinal stem cells. The germinal stem cells are differentiated from primordial germ cells which are arisen during embryogenesis. Furthermore, the primordial germ cells are originated from a fertilized egg. Thus, we try to manipulate genetic information and chromosome sets of primordial germ cells, and try to produce genetically manipulated gametes derived from the primordial germ cells via germline chimera called "Surrogate propagation."

SELECTED PUBLICATIONS :

Fujimoto, T., T. Nishimura, R. Goto-Kazeto, Y. Kawakami, E. Yamaha and K. Arai (2010)
Sexual dimorphism of gonadal structure and gene expression in germ cell-deficient loach, a teleost fish.
Proceedings of National Academy of Science USA, **107**: 17211-17216, DOI: 10.1073/pnas.1007032107

Fujimoto, T., G. S. Yasui, M. Hayakawa, S. Sakao, E. Yamaha and K. Arai (2010)
Reproductive capacity of neo-tetraploid loaches produced using diploid spermatozoa of a natural tetraploid male. *Aquaculture*, **308**: S133-139, DOI: 10.1016/j.aquaculture.2010.04.029