

1. Experiment Title

Detection of male germ cell mutagenesis in space environment using Medaka as vertebrate model.

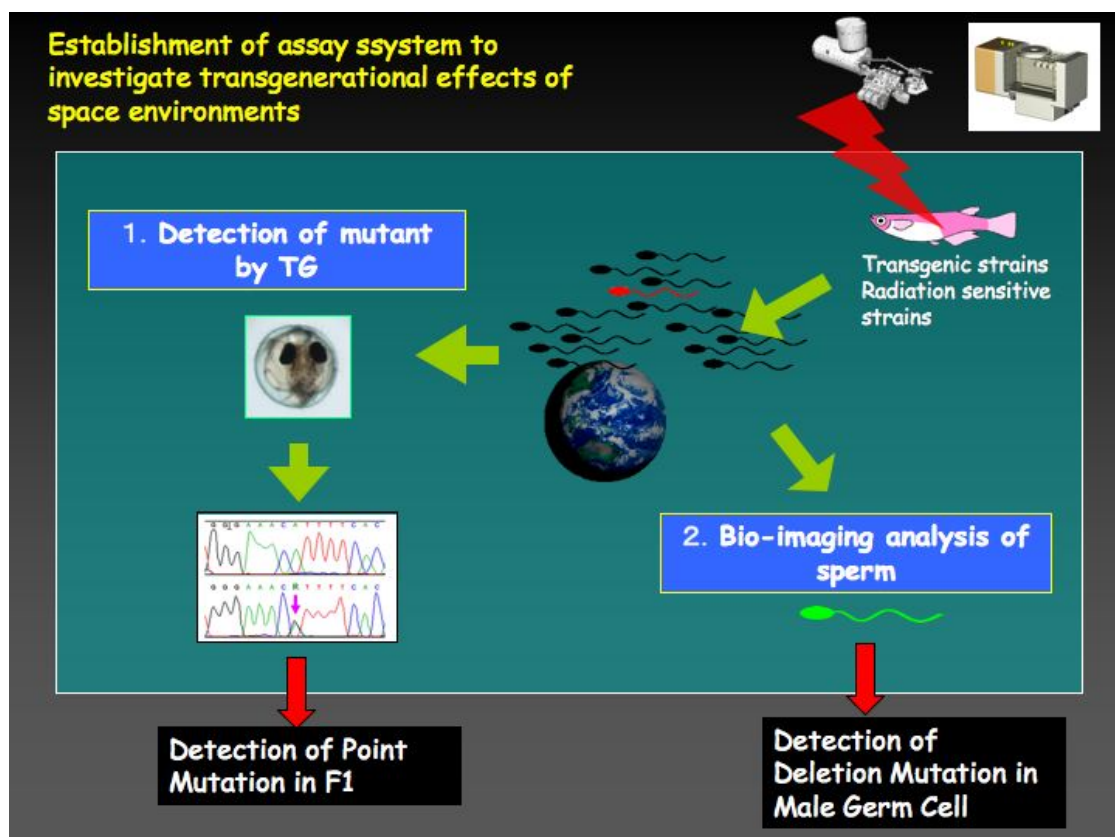
2. Principal Investigator

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3. Outline of Experiment

During space flights, crew members are constantly exposed to different types of radiation with very low dose rate. Such radiation damages the cellular DNA, and may induce mutations in germ cells. Large-scale research of the germinal mutation in the space environment has been restricted to microbes, *Caenorhabditis elegans* and *Drosophila*. Medaka (*Oryzias latipes*), is a useful experimental animal and precise system to measure germ cell mutation induction by specific locus test was established and found that the spontaneous and γ -ray induced mutation rates of the fish are very similar to those of mice. We are developing novel systems which can detect germ cell mutagenesis derived from male fish after long term stay in space. The point variation and frame shift variation will be detected by a high-throughput method using F1 embryos. The transgenic medaka strains with transgenic visible fluorescent genes as tester can be used to detect morphological abnormalities in male germ cells and their deletion-type mutations. These systems could be applied in radiation sensitive mutant strains to increase the detection sensitivity as well. These systems will enable a better assessment of the genetic risk for humans in space and, in the long-term, will contribute to optimise radiation shielding for future space exploration missions.



4. Experiment Facility

Aquatic Habitat (AQH)

Passive Dosimeter for Lifescience Experiments in Space (PADLES)