

# Mutation Detection System: Transgenic Teleost Fish

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## Technology description

### Background

The ability to assess the mutagenicity of compounds is important in a wide-variety of areas ranging from drug discovery to industrial chemicals to environmental assessment. Animal model systems play an important role in mutagenicity assessment. While zebrafish and mice have enjoyed more attention, the transgenic Japanese medaka is a valuable alternative for environmental hazard assessment, toxicology and biomedical research.

### Technology Summary

A researcher at the University of Georgia developed transgenic fish designed to extend and improve methods used to assess the potential genetic health risks posed by numerous agents (e.g. new chemical entities, mutagens in the environment, etc.). The fish were developed for in vivo quantitation of spontaneous and induced mutations using a recoverable mutation target gene and assay system.

## Advantages

- Smaller than mice and other transgenic fish
- Cheaper to maintain
- Capable of generating larger numbers
- Ability to conduct analysis at embryonic stages
- Shorter time required to generate the schools implies replication studies are easier and quicker.

The transgenic fish combine the benefits of a whole animal mutation assay, including the ability to detect gene mutations directly at the DNA level and in a variety of tissues, with the advantages of fish as animal models. In addition, the system has the distinct advantage compared to other transgenic mutation detection systems of being able to detect a wide spectrum of mutations, particularly large sequence rearrangements induced by clastogenic agents such as radiation.

## Institution

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