

Efficient Sterilization of Fish by Disruption of Germ Cell Development

A new method efficiently induces 100% sterility in farmed fish by briefly treating embryos, preventing genetic contamination and giving farmers full control over stock fertility.

Sterilization of farm-raised fish is important to expedite growth and prevent genetic contamination of native fish populations; however, current methods of sterilization have a number of disadvantages. One method of sterilization, manipulation of chromosome number (triploidization), does not always result in complete sterilization and requires species-specific treatments. Another sterilization method is hormone-gene silencing, which irreversibly alters the population of fish, making it difficult to maintain brood stock. As demand for farm-raised fish rises, more efficient and effective sterilization techniques are needed to alleviate these concerns.

Researchers at Purdue University have developed a novel strategy that efficiently induces sterility in 100 percent of treated fish without affecting any other physiological characteristics of the fish. This method disrupts the migration of primordial germ cells (PGCs), which produce sperm or eggs, to the gonads. When desired, sterility can be easily induced by briefly treating large batches of embryos that will then develop into non-fertile adult fish, giving farmers complete control over the fertility of the farmed fish. Potential escapees are, therefore, incapable of breeding with or among native fish populations. Furthermore, the general molecular mechanism by which PGCs migrate to the gonads is conserved among vertebrate species, so this treatment should be effective for virtually any aquaculture fish.

Advantages:

- Induced sterility in 100 percent of treated fish
- Inducible and controlled
- Same method can be used on all species

Potential Applications:

Technology ID
65736

Category

Biotechnology & Life
Sciences/Synthetic Biology &
Genetic Engineering
Agriculture, Nutrition, &
AgTech/Livestock & Animal
Health Solutions

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-Fish farming industry

-Aquaculture industry

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Intellectual Property:

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