

## An mRNA Sequence and Method for Improving Infertility

We are looking to out-license the technology for its commercialization.

***Administering a specific mRNA sequence to mice with congenital infertility effectively restored their reproductive capability.***

### ◆Background

In the research of gene therapy for infertility, DNA and RNA viruses have been used to treat mouse models of infertility. However, these viral-based approaches have raised concerns about the risk of carcinogenesis due to the long-term persistence of viral vectors in the host. Also, mRNA-based approaches have been considered unsuitable for long-term gametogenesis because of the transient nature of protein expression.

### ◆Description

Mice with congenital infertility are infertile due to a genetic deficiency in specific molecules. In this invention, the injection of a specific mRNA into the testes of male mice with cessation of spermatogenesis induced the progression of spermatogenesis, and elongated spermatids, which are mature haploid germ cells, were detected (Fig.1). Using these spermatids, the research team performed intracytoplasmic sperm injection (ICSI) and successfully generated offspring. In addition, they also succeeded to produce offspring by administering the specific mRNA to infertile female mice.

- mRNA is not integrated into the genome, enabling a safe approach to infertility treatment.
- mRNA expression is transient and does not cause any detrimental effects on the body.
- Natural pregnancy can be achieved without in-vitro fertilization treatment even after chemotherapy or radiation therapy.

### ◆Development Status

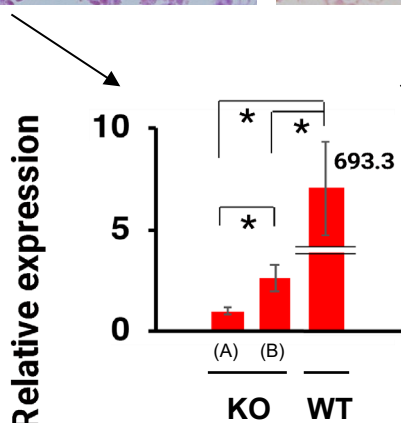
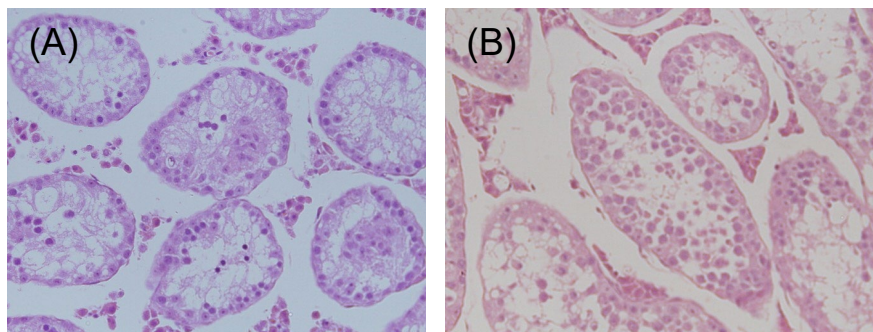
- Effective fertility restoration in both male and female mice observed by administration of a specific mRNA sequence

### ◆Applications

- Development of a new reproductive medicine
- Veterinary pharmaceuticals

### ◆Offer

- Patent License
- Option for Patent License



**Fig.1 Fertility restoration results with male mice**

In male mice with a specific genetic deficiency (A), spermatogenesis is arrested at the spermatocyte stage, leading to infertility. By injecting a specific mRNA into the testes of these mice, however, it was observed that the spermatogenesis was promoted, leading to the elongation of spermatids (B).

### ◆Contact

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