Weill Cornell Medicine

Automated Intracytoplasmic Sperm Injection Device

Lead Inventors:

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Background & Unmet Need

- *In vitro* fertilization procedures were introduced in the 1970s, enabling the creation of human embryos outside of the body to assist couples dealing with infertility
- Intracytoplasmic sperm injection (ICSI), invented by Dr. Gianpiero Palermo in 1992, is a procedure in which a single sperm is injected directly into an egg
- ICSI is widely used and is one of the preferred methods of IVF, resulting in ~2 M babies to date
- However, ISCI requires multiple labor-intensive steps, increasing costs and allowing for human error
- **Unmet Need:** Automated procedure for ICSI to reduce costs and increase

Technology Overview

- **The Technology:** Automated microfluidic platform for ICSI
- Combines all aspects of ICSI into a single, easy to use microfluidics platform
- The device consists of an oocyte (egg) reservoir, an oocyte cumulus removal channel, an oocyte immobilizing station, a sperm reservoir, a motile sperm isolation channel and station, and an embryo culturing chamber
- Compared to manual ICSI procedures, this technology promises to reduce labor intensity and costs and improve ICSI consistency

Inventors:
Gianpiero D. Palermo

Patents:
US Patent 9,499,778
EP Patent 2,838,987
CN Patent 104254596B

Publications:
N/A

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Technology Applications

- Automated device for intracytoplasmic sperm injection of human embryos for IVF
- Animal husbandry programs
- Platform for fertility research

Technology Advantages

- Disposable microfluidics cassette is inexpensive and easy to use
- Automation increases throughput and reliability
- Reduces associated labor intensity and costs

Supporting Data / Figures

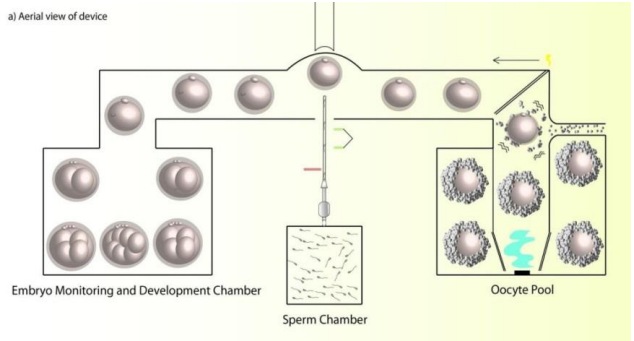

Figure 1: Overview of the automatic sperm injection device. Oocytes enter a microfluidic channel, are automatically injected with sperm, and then proceed to an embryo monitoring and development chamber.

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