An Automated Intracytoplasmic Sperm Injection Device

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Technology description

Intracytoplasmic sperm injection (ICSI) is a method used in in vitro fertilization, where a single sperm is directly injected into an egg to fertilize it. Though efficient, it is a labor intensive and high cost process, and therefore subject to human error and restricted in availability and cost. The invention is an automated microfluidic platform for ICSI. The invention is in the design phase.

In vitro fertilization procedures were introduced in the 1970s, enabling the creation of human embryos outside of the body to help couples dealing with infertility. Since then, assisted reproductive technologies have developed. Dr. Gianpiero Palermo invented intracytoplasmic sperm injection (ICSI) in 1992, a procedure in which a single sperm is injected directly into an egg. ICSI is widely used and preferred, and has generated about 2 million babies to date. However, ISCI consists of multiple labor intensive steps which can introduce human error, and is costly which makes it inaccessible to many. In addition, outcomes in different countries are inconsistent, making it difficult to standardize ICSI.

While proposals have been made to automate various steps of the ICSI procedure, there exists no single automation system that starts from sperm/egg preparation and ends with embryo incubation. Dr. Palermo has designed an integrated automated system that does so, which reduces labor intensity and cost while increasing result consistency. As shown in the figure below, Dr. Palermo’ s device is a disposable cassette, used on a microfluidics platform device, consisting of an oocyte (egg) reservoir, an oocyte cumulus removal channel, an oocyte immobilizing station, a sperm reservoir, both a motile sperm isolation channel and station, and an embryo culturing chamber.

Cornell has held discussions with companies with microfluidics platforms and companies that provide reagents and media in the IVF field; several are interested in participating in a joint venture. Cornell seeks a licensee or entrepreneur to prototype, develop, and commercialize this product.

Application area

In vitro fertilization

Institution

Cornell University

Inventors

Gianpiero Palermo

联系我们

叶先生

电 话：021-65679356

手 机：13414935137

邮 箱：yeyingsheng@zf-ym.com