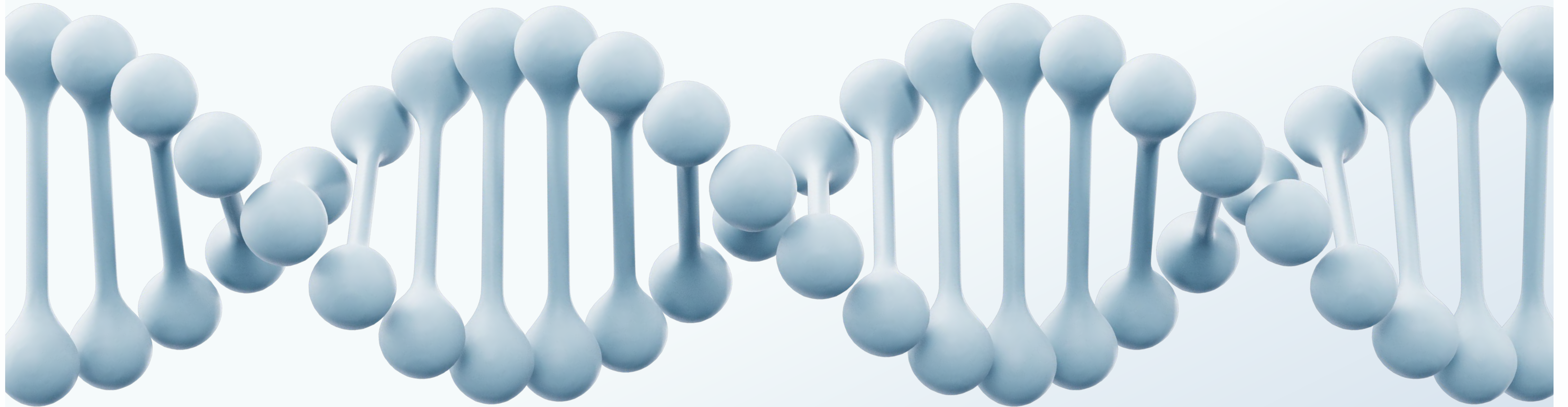


ECTOGENESIS

development of an embryo outside the uterine cavity

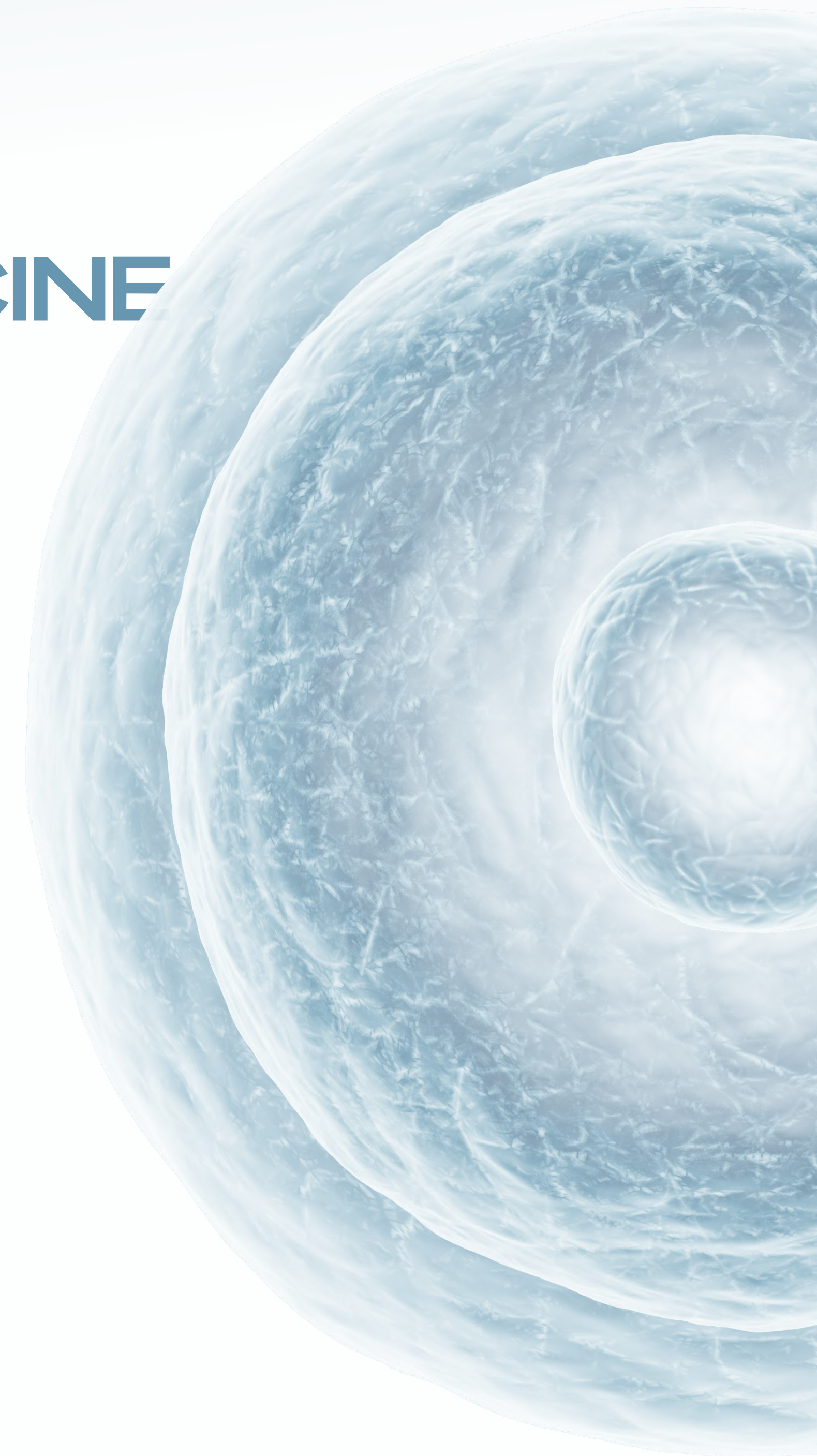


SIGNIFICANCE AND TRENDS OF ECTOGENESIS IN MODERN MEDICINE

Every sixth couple worldwide faces infertility issues, according to the World Health Organization

The success rates of various ectogenesis methods vary, ranging from 30% to 60% successful pregnancies post-application

Trends in the development and utilization of ectogenesis methods are being observed globally, with increasing interest and research in this field, especially in recent decades



CURRENT ISSUE OF INFERTILITY WORLDWIDE

**MORE THAN
186 MILLION**

couples worldwide face the issue of infertility,
according to the World Health Organization

**UP TO
15%**

of couples experience infertility
in developed countries

**AT LEAST
50 MILLION**

couples in developing countries
struggle with infertility issues



E2E EMBRYO TRANSPLANTATION METHOD

Studies indicate that the E2E embryo transplantation method can be effective for couples with specific medical issues such as tubal anomalies or a history of repeated unsuccessful IVF attempts

As a result of research, the technology of “converting” an ectopic pregnancy into a uterine pregnancy through autotransplantation was tested

Description of the Method:

E2E embryo transplantation is a procedure where an embryo, fertilized and grown outside the mother's body, is transferred from the fallopian tube directly into the uterus of a woman

The procedure is typically performed using laparoscopic access to isolate the portion of the fallopian tube with the pregnancy and subsequently transport the embryo into the uterus



UTERINE LAVAGE METHOD FOR EMBRYO REMOVAL

Description of the Method:

The uterine lavage method, also known as "uterine cavity flushing" or "embryo washout," is a procedure used when an embryo fails to implant into the uterine wall after in vitro fertilization (IVF).

The process begins with the introduction of a special solution into the uterine cavity, which helps to remove unsuccessfully implanted embryos. Then, using gentle catheterization, the embryos are washed out from the uterus and transferred into a medium enriched with the patient's own oxygen and platelets.

In cases where viable embryos are among those removed, they may be transferred back into the uterine cavity

UTERINE LAVAGE METHOD FOR EMBRYO REMOVAL: EXAMPLES OF SUCCESSFUL CASES

First documented cases of live births resulting from genetically screened human euploid blastocysts obtained through uterine lavage. Embryos transferred to infertile women were acquired using a new fully automated uterine lavage catheter and fluid recovery device

RESULTS

- Nine embryo transfer procedures with 14 blastocysts in eight women, yielding a blastocyst implantation rate of 36% and a live birth rate of 44%
- Five infants born from the four delivered pregnancies, including one set of twins

ARTIFICIAL WOMB

Description of the Method:

The artificial human womb is a technology developed for the development of embryos outside the mother's body. It is a device designed to mimic the conditions provided by the womb for the embryo during pregnancy.

The artificial womb provides necessary conditions for the growth and development of the embryo, including temperature, nutrition, artificial respiration, and mechanical support



ARTIFICIAL WOMB:

EXAMPLES OF SUCCESSFUL CASES

The global community is currently engaged in advanced discussions regarding the application of artificial womb technology in humans.

In September 2023, Researchers from the Children's Hospital of Philadelphia (CHOP) held a meeting with the U.S. Food and Drug Administration (FDA) to discuss the application of a device called EXTEND, which they deem as the most "ready" for human trials

The groundwork for these discussions is laid by successful trials:

Philadelphia Lamb Studies (2017)

- Dr. Alan Flake and his team developed an artificial womb named Biobag, where they placed lambs for a duration of 4 weeks.
- Test results showed that the lambs had well-developed lungs and brains, and they were perfectly healthy.

Netherlands Research Grant (2019)

- €2.9 million grant to Eindhoven University of Technology for an artificial womb.
- A consortium aims to mimic biological conditions closely, including maternal heartbeat.

Mice Trials in Israel (2021)

- Weizmann Institute of Science grew mouse embryos in artificial womb called Ex Utero.
- The device aided in growing embryos with functioning hearts and brains.

Artificial Womb from China (2022)

- Suzhou scientists developed AI-monitored artificial womb.
- Neural network tracks embryo growth and alerts doctors of deviations.

University of Michigan Research

- Technology for premature infants, filling only lungs with fluid.
- Initial experiments conducted on lambs.