

# MEDNEWS

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# MIRI® Evidence as the Ultimate Traceability Tool for an IVF Laboratory

Reproductive societies such as the European Society for Human Reproduction and Embryology (ESHRE), the American Society for Reproductive Medicine (ASRM) and the regulatory bodies like the Human Fertilization and Embryology Authority (HFEA), have evaluated and produce code of practice to be used throughout an IVF cycle to correctly identify the patients and collect the right specimen and to properly handle the procedures. It is well established that the list of IVF procedures that are required to be double witnessed include:

## Patient specimen labeling

- Oocyte pick-up
- Sperm reception and preparation
- Mixing sperm and the egg or sperm injection into eggs
- Transfer of gamete or embryos between dishes
- Embryo transfer
- Insemination using sperm prepared in the laboratory
- Placing gametes or embryos into cryopreservation
- Thawing gametes or embryos from cryopreservation
- Disposal and/or transport of gametes or embryos

Any mistakes in any of the mentioned steps can result in loss or mismatch/mix-up of samples. The more individual involved in one sample, the more probability of error to happen, hence why it has to be a requirement for IVF laboratory to conduct double witnessing during the action of these steps.

EWS was introduced to the field to focus on reducing the possibility of error and as a traceability tool, with additional benefit through different functions in helping the clinic to comply to the SOP, implementing quality management system and many more.

MIRI® Evidence as a part of the Esco Medical family acts as a traceability tool within an IVF laboratory to manage all the procedural steps by helping to eliminate the risk of human errors and preventing system mix-ups. Aside from that, MIRI® Evidence will also help the associated clinic to comply with the current SOP and the existing regulation by providing a quality management system. Implementation of MIRI® Evidence will be placed in every step of an ART cycle, therefore, will provide a chronological record of documentation.

Some of the key features of the MIRI® Evidence include its hybrid labeling system that makes use of human readable labeling, barcode and RFID tags which guarantee the embryologists that they are consciously working on the correct sample of each patient, while also providing a complete range of labels for various specimen cups, conical tubes, culture dishes, and vitrification straws. MIRI® Evidence provides a chain of custody system as it is enabled as a traceability tool within the fertility clinic, connotating that proper documentation is kept throughout the cycle starting from the beginning until the end of the process. MIRI® Evidence is able to smoothly be integrated/retrofitted to the clinic's existing equipment and system which would ensure the quality of the information being exchanged, moreover performance report can be generated to access the insight on the KPIs of the laboratory allowing an easier path to further improve efficiency. As a traceability tool, MIRI® Evidence is able to enhance the performance of a clinic by automatically generate scheduling for a patient upon final consultation and registration, the built-in validation engine within the program of MIRI® Evidence can assure the transfer of all data related to a specific patient.







## Advancements in Creating Synthetic Human Embryos Using Stem Cells

In a groundbreaking scientific achievement, researchers have successfully generated synthetic human embryos using stem cells. This landmark accomplishment has the potential to revolutionize medical research and offers insights into genetic disorders and recurrent miscarriages. However, this achievement raises ethical and legal concerns, as these laboratory-engineered entities exist beyond the scope of current legislation in the United Kingdom and most other countries globally.

These lab-cultivated embryo models closely mimic the earliest stages of human development, providing scientists with a unique opportunity to investigate genetic disorders and understand the biological triggers of recurrent miscarriage. Unlike natural embryos, these lab-grown structures do not possess a beating heart or preliminary brain development, but they do contain cells that typically form essential elements of the embryo, such as the placenta and yolk sac. While the creation of these human embryo-like models represents a significant scientific leap, their practical clinical use currently faces legal restrictions that prohibit their implantation into a patient's womb. Furthermore, their ability to mature beyond the initial developmental stages remains unconfirmed.

The primary motivation behind this research is to illuminate the "black box" period of development. Due to legal constraints, scientists can only culture embryos in labs for up to 14 days, hence the name given to this developmental period. Subsequent tracking of development occurs much later, relying on pregnancy scans and donated embryos for research purposes.

This innovative approach offers an unprecedented opportunity to gain in-depth knowledge about embryonic development and potential complications without relying on early-stage embryos for research.

This scientific breakthrough builds upon previous successes where teams demonstrated the ability of mouse stem cells to self-assemble into early embryo-like structures.

This prompted efforts to apply these findings to human models, with several teams successfully replicating the earliest stages of human development. It's worth noting that while these novel findings have not been published in detail in a peer-reviewed journal, reports indicate that the embryos were cultivated slightly beyond the equivalent of 14 days of development in natural embryos.

These lab-grown structures, each originating from a single embryonic stem cell, achieved a developmental milestone known as gastrulation. During this process, the embryo transitions from a continuous cell sheet into distinct cell lines, establishing the basic body's axes. Although these models lack organs like a heart, gut, or preliminary brain, they do exhibit the presence of primordial cells, which are precursors to egg and sperm cells.

This scientific advancement highlights the growing gap between the pace of scientific progress and the development of associated legal frameworks. Current legislation fails to account for the close resemblance of these models to natural embryos, sparking concern among researchers and society at large.

Another complex question arises concerning whether these synthetic structures could theoretically develop into living organisms. Previous attempts to implant synthetic embryos derived from mouse and monkey cells into female animals' wombs did not result in the birth of live offspring. Whether this is a technical challenge or a deeper biological issue remains unclear.

The future of this innovative field is uncertain, but the need for comprehensive legislation is evident. The question of whether synthetic embryos could potentially become living beings underscores the urgency of addressing ethical concerns and evolving the regulatory landscape alongside scientific advancements.

**Source:** Synthetic human embryos created in groundbreaking advance | Biology | The Guardian



# New Study Reveals Seasonal Influence on Live Birth Rates in IVF

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The Australian research team made a compelling discovery: embryos derived from eggs collected during the summer months, which had been initially frozen and then thawed, exhibited a 30% higher likelihood of resulting in live births compared to those collected during the autumn. Dr. Sebastian Leathersich, the lead researcher, noted, "When eggs were collected in the autumn, the live birth rate stood at 26 births per 100 people. In contrast, if eggs were collected during the summer, there were 31 births per 100 people. Importantly, this improvement was evident regardless of when the embryos were eventually transferred into the women's wombs."

Moreover, the study revealed that there was a 28% increase in the chances of a live birth when eggs were collected on days with the most sunshine compared to those with the least sunshine.

This research offers fresh insights into seasonal variations in fertility, as previous studies have presented conflicting findings regarding the influence of seasons on pregnancies and live birth rates after egg collection and embryo freezing. Dr. Leathersich explained, "Most previous studies focused on fresh embryo transfers, where the embryo is returned within a week of egg collection. We realized that many embryos are now 'frozen' and transferred later, allowing us to explore the impact of environmental factors on egg development and early pregnancy separately."

To arrive at these conclusions, the study analyzed outcomes from all frozen embryo transfers conducted at a single clinic in Perth over an eight-year period. The researchers meticulously considered factors such as the season, temperature, and the actual number of hours of bright sunshine.

The results consistently demonstrated that the likelihood of a live birth was higher when eggs were collected on days with more sunshine, regardless of the season and conditions during the subsequent embryo transfer. Interestingly, the study found that temperature on the day of egg collection did not influence live birth chances. However, live birth rates did decrease by 18% when embryos were transferred on the hottest days, accompanied by a slight rise in miscarriage rates. Dr. Leathersich emphasized, "Our study suggests that the best conditions for live births appear to be associated with summer and increased sunshine hours on the day of egg retrieval." Several factors may contribute to this phenomenon, including melatonin levels, which are typically higher in winter and spring, and lifestyle differences between winter and summer months.

Nevertheless, it's important to note that this study, due to its retrospective nature, can only demonstrate an association between conditions at the time of egg collection and the difference in live birth rates, rather than causation. Dr. Leathersich called for further research to confirm these findings in different settings, with varying conditions and treatment protocols. He also expressed an interest in exploring the impact of seasonal and environmental factors on sperm parameters. Given the growing popularity of "social egg freezing" for fertility preservation, Dr. Leathersich highlighted, "It would be very interesting to see if these observations hold true with frozen eggs that are thawed and fertilized years later."

While this study offers intriguing implications for fertility treatments, it also underscores the complex interplay between environmental factors and biological processes, providing a glimpse into the ever-evolving landscape of reproductive medicine.

Source: *Season of egg retrieval* ([eshre.eu](https://eshre.eu))







## NEW STUDY REVEALS:

# One in Five Women Can Conceive Naturally After IVF

In a groundbreaking study published in *Human Reproduction*, scientists challenge the conventional understanding of natural conception in women who have previously given birth through assisted reproductive technology (ART), such as in vitro fertilization (IVF) or intracytoplasmic sperm injection (ICSI).

Dr. Annette Thwaites led the research, which systematically reviewed and analyzed data from various sources to determine the proportion of women experiencing natural conception after an ART-aided live birth. Surprisingly, the study suggests that natural conception may occur in at least one in five women after having a baby through ART, a significantly higher number than previously believed.

This study challenges the prevailing notion that such natural pregnancies are rare “miracle” occurrences, emphasizing that they are more common than previously thought.

Researchers conducted a systematic review with a meta-analysis, examining studies published between 1980 and September 24, 2021. They searched Ovid Medline, Embase, and PsycINFO databases for English-language studies involving human subjects. The main criterion for inclusion was studies measuring the proportion of women experiencing natural conception following an ART live birth.

The study assessed the quality of included studies using the Critical Appraisal Skills Programme cohort study checklist or the AXIS Appraisal tool for cross-sectional studies. They utilized random-effects meta-analyses to estimate the pooled proportion of natural conception pregnancies after ART live births.

Out of 1108 initially identified studies, 11 involving 5180 women were selected for review. These studies had follow-up periods ranging from 2 to 15 years. The pooled estimate for the proportion of women experiencing natural conception pregnancies after ART live birth was 20% (95% CI, 17-22%).

The study acknowledges certain limitations, such as methodological variability, differences in populations, causes of subfertility, types of fertility treatments, and follow-up durations among the considered studies. These variations may introduce potential biases related to confounding, selection, and missing data.

The study's findings have far-reaching implications, particularly in dispelling misconceptions about natural conception after ART. This knowledge is essential for healthcare professionals and couples who have undergone or are considering ART procedures.

Recognizing the frequency of natural conception following ART, tailored counseling for couples contemplating further ART procedures becomes crucial.

Dr. Thwaites and her team advocate for national, data-linked studies to provide more accurate estimates and analyze factors associated with natural conception after ART. Such data would empower women and couples to make informed decisions about family planning and additional fertility treatments.

This research, supported by the National Institute for Health Research (NIHR) as part of an academic clinical fellowship awarded to Dr. Thwaites, is poised to revolutionize perceptions and practices in the field of reproductive science.

Source: <https://www.bbc.co.uk/news/health-65960209>





## Esco Medical Showcases Cutting-Edge IVF Solutions at ASPIRE 2023 Congress

Esco Medical proudly participated in and supported the 12th Congress of the Asia Pacific Initiative on Reproduction (ASPIRE 2023) as an exhibitor. Held at the Adelaide Convention Centre in Australia from September 7 to 10, 2023, this year's congress marked a significant return to in-person events after a period of virtual gatherings necessitated by the pandemic. The theme for ASPIRE 2023 was "Welcome

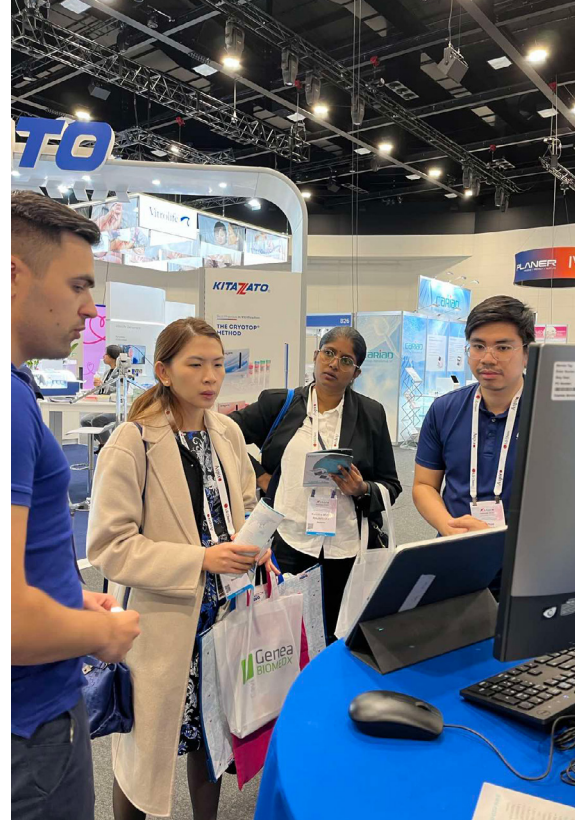
Back to Our Future," reflecting the anticipation and enthusiasm for a return to normalcy in the field of reproductive medicine.

ASPIRE 2023 featured a rich array of engaging scientific content, spanning basic reproductive sciences, embryology, and clinical sessions that provided updates on the cutting-edge developments in reproductive medicine. Esco Medical was delighted to be part of this vibrant event, where we showcased our state-of-the-art equipment to demonstrate how our solutions can assist IVF practitioners, clinics, and laboratories in achieving their goals in reproductive health and technology.

Among the equipment on display were the MIRI® Time-Lapse Incubator, MIRI® Multiroom Incubator, MIRI® II Multiroom Incubator, and Mini MIRI® Incubator. These cutting-edge devices exemplify Esco Medical's commitment to innovation and excellence in the field of assisted reproduction. We were thrilled to engage with the ASPIRE community and share our expertise in IVF solutions.

Esco Medical extends its heartfelt gratitude to ASPIRE for the invaluable opportunity to showcase our innovative IVF solutions and connect with the ASPIRE members. We are truly thankful to everyone who took the time to visit our booth and explore our offerings. The positive feedback and interactions we received from attendees have energized our team, and we eagerly look forward to ASPIRE 2024, where we hope to continue advancing the frontiers of reproductive medicine and technology.

As we continue to navigate the evolving landscape of reproductive health, Esco Medical remains steadfast in our commitment to providing cutting-edge solutions that empower the healthcare community to create brighter futures for families around the world.





# Events & Installations

## ACE 2023



## DVR 2023



## MIRI® TL WORKSHOP IN INDIA 2023



## China Installations

