

# MED NEWS

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## Innovating Reproductive Technologies: Esco Medical’s Back-to-Back TL Workshops in Dubai and Bangkok.

Esco Medical has been dedicated to advancing the field of reproductive medicine for years now by continuously developing various technological solutions, and sharing new insights and experiences with IVF clinics and professionals across the globe.

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## Binge-Drinking Alcohol may Ruin a Man’s Chance of IVF success, study suggests

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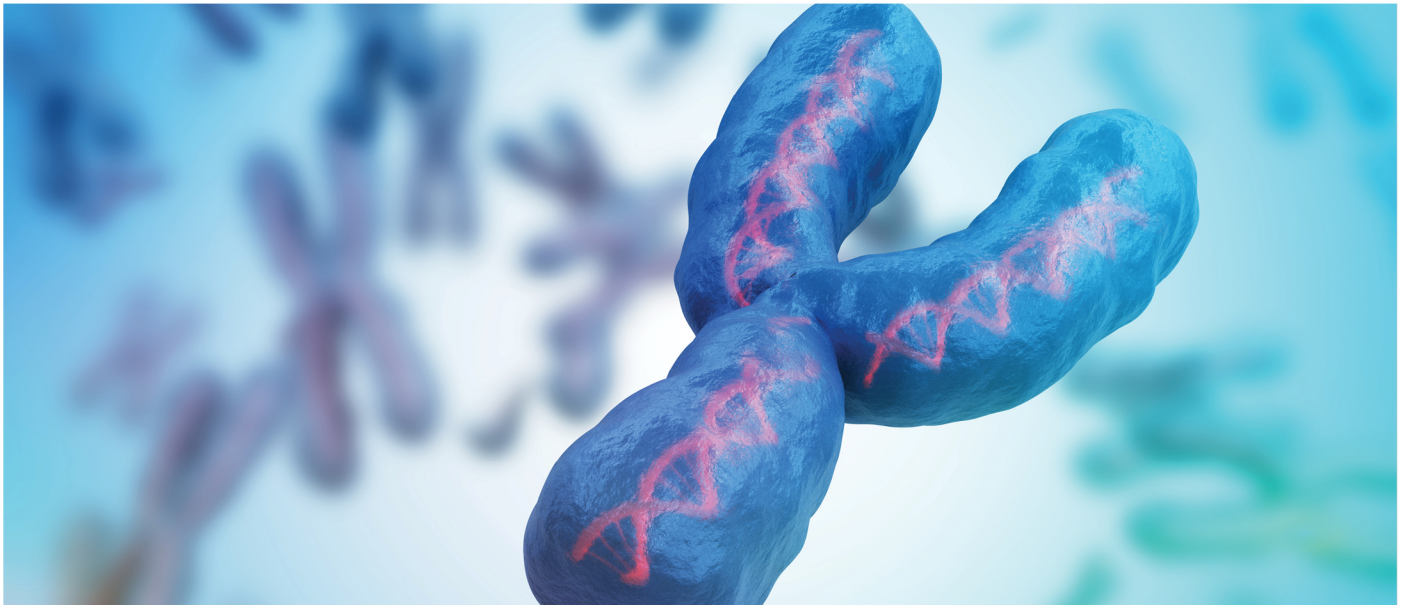
### Key considerations in choosing suitable embryo incubators for your IVF lab

With advances in manufacturing and technology, incubators now exist with varying capacities and capabilities. That’s why the selection of an incubator for the IVF laboratory has become an increasingly complex process.

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# A Novel Sex Gene May Provide Hope For Mankind As The Y Chromosome Devolves Slowly



A male-determining gene on the Y chromosome controls the sex of newborn mammals, including humans. Yet unless we develop a replacement sex gene, the human Y chromosome will eventually degenerate to the point where it would disappear in a few million years, putting an end to our species. The good news is that two rodent species have already experienced Y chromosome loss while being viable.

A recent study in Proceedings of the National Academy of Science demonstrates how the spiny rat has evolved a novel gene that determines whether an animal is male or female.

## **How The Human Sex is Determined by The Y Chromosome**

Like other mammals, humans have two X chromosomes for females and one X and a little Y chromosome for males. Over 900 genes in the X perform various tasks unrelated to sex.

However, there are only about 55 genes in the Y, and most of the DNA is non-coding, or just repetitive DNA that doesn't appear to accomplish anything.

However, because it carries a crucial gene that initiates male development in the embryo, the Y chromosome is potent. This master gene activates other genes that control the growth of a testis at around 12 weeks after conception. Male hormones (testosterone and its derivatives), which are produced by the embryonic testis, ensure that the infant develops into a boy.

SRY (sex region on the Y), the master sex gene, was discovered in 1990. It operates by initiating a genetic pathway that begins with the SOX9 gene, which, despite not being located on the sex chromosomes, is essential for the determination of male gender in all vertebrates.

## **The Vanishing Y Chromosome**

The majority of mammals share our X and Y chromosomes, which have an X with many genes and a Y with SRY and a few additional genes. Because males and females have different amounts of X genes, this system has issues.

How did such a strange system come to be? The unexpected discovery is that the platypus in Australia has completely different sex chromosomes, which are more similar to those of birds. The XY pair in platypus is merely a regular chromosomal pair with two equal components. This shows that not so long ago, the animal X and Y chromosomes were a common pair.

This implies that during the 166 million years that humans and platypus have been developing independently, 900–55 active genes have been lost from the Y chromosome. That equates to a loss of five genes per million years. The final 55 genes will be extinct in 11 million years if this pace continues.

## **What This Implies For Men's Future**

Future scenarios have been discussed in light of the Y chromosome's impending extinction, at least in evolutionary terms.

A process known as parthenogenesis allows some lizard and snake species, which are exclusively found in females, to create eggs from their own genes. Yet, neither humans nor other mammals can experience this since we have at least 30 essential genes that are "imprinted" and only function when passed on from the father through sperm.

Because men and sperm are required for reproduction, the loss of the Y chromosome may signal the end of the human race.

The latest discovery lends support to a different hypothesis, namely that humans could develop a new sex-specific gene. However, there are dangers associated with the emergence of a new sex gene. What if different regions of the earth experience the emergence of multiple new systems? The split of new species as a result of a "battle" of the sex genes has already occurred in mole voles and spiny rats.

Hence, if someone traveled to Earth in 11 million years, they might not find any people there or find a number of distinct human species, each with its own technique for determining sex.





# Key considerations in choosing suitable embryo incubators for your IVF lab

With advances in manufacturing and technology, incubators now exist with varying capacities and capabilities. That’s why the selection of an incubator for the IVF laboratory has become an increasingly complex process. In this article, let’s discuss the tips and tricks on how to choose the most suitable embryo incubators for your IVF lab.

## Gas Monitoring

It is best for you to make sure that your incubators can do an accurate measurement of CO<sub>2</sub> and O<sub>2</sub> concentrations, so the appropriate growth conditions are maintained.

There are two primary methods used to monitor CO<sub>2</sub> concentration: thermal conductivity (TC) and infrared (IR) sensors. IR sensors are independent of both humidity and temperature. Thus, incubators utilizing TC sensors tend to take a longer time to measure and stabilize CO<sub>2</sub> levels following door openings.

There are also two methods used to monitor O<sub>2</sub> concentration: galvanic and zirconium sensors. Galvanic sensors tend to have slower response times and require more frequent replacement compared to zirconium sensors.

Water-jacketed incubators retain heat for longer during incubator openings or power failure but tend to have a higher power consumption and may burden emergency power supplies. Air-jacketed incubators warm up quickly but do not retain heat for long periods with an interrupted power supply.

Direct-heating method results in very rapid heat recovery following door opening, but maintaining this temperature during power interruption can be problematic.

## Humidity

Although elevated humidity can reduce media evaporation, keep in mind that the presence of a water reservoir is also a potential source of contamination therefore should be monitored.

Many new IVF-specific benchtop incubators do not provide humidification because humidity inside the incubator is not necessarily required to culture embryos. With enough oil overlay and appropriate exchange of media, high-quality embryo development in a non-humidified incubator is achievable.

## Air Quality

The presence of VOCs in the air may impact preimplantation embryo development, so it’s important for your incubators to have inline gas VOC filter installed. Another approach to improve air quality includes recirculating the atmosphere via a UV light source to reduce possible microbial and breakdown VOCs.

## Chamber Size

Depending on the laboratory workflow, smaller incubators may help improve gas recovery and reduce environmental stress, leading to improved outcomes compared to large-box incubators which may require an extended time to refill with CO<sub>2</sub> and nitrogen gases

## Which Incubator is Best for You?

Esco Medical’s IVF incubators work excellently in monitoring and controlling essential parameters to provide the best environment for your embryo development.

Our range of incubators can meet and showcase these vital specifications, from benchtop to timelapse. Even our box-type CO<sub>2</sub> incubator is equipped with these features.

Our benchtop incubators have high flexibility that allows users to choose between pure gas inserts or premixed gas.

We also utilize an IR sensor as it is independent of both humidity and temperature, therefore will have a quicker time to stabilize CO<sub>2</sub> levels following door openings.

Whether you need humid or dry culture, you can also have the flexibility to choose! The VOC filter equipped in our dry incubators will make sure that it will provide the best air-filtered quality for your embryo. You can also choose the size and amount of chambers that would best suit your lab.





# Binge-Drinking Alcohol may Ruin a Man's Chance of IVF success, study suggests

Alcohol can even affect one's fertility status. Male fertility, generally speaking, is dependent on the quantity and quality of the sperm. When the sperm quantity is lower or is of poor quality, it would be harder for a couple to have a successful pregnancy. In men, alcohol may affect fertility by modifying the characteristics of the semen, such as altering the sperm count and morphology.

Studies have been conducted worldwide to determine the consequence of alcohol consumption on sperm quality. Some discovered that moderate consumption of alcohol is associated with better semen volume and concentration, suggesting that more limited alcohol ingestion may improve the quality of sperm.

On the other hand, there is an association between a high intake of alcohol and male reproduction, which negatively affects the quality of semen ejaculated. This poor semen quality is caused by the excessive production of reactive oxygen species (ROS) during the conversion of alcohol to its metabolite, acetaldehyde, which is considered highly toxic to cells.

This alcohol metabolism process generates ROS towards proteins, lipids, and cellular structure. will cause oxidative stress, defined as a condition many unstable molecules known as free radicals, antioxidants to get rid of them. Eventually, this tissue, and DNA damage.

This also applies to sperm cell regulation, causes the alteration of specific gene in spermatogenesis and could lead to DNA poor quality are produced.

Interestingly, studies discovered that contribute to different biologic influences success of IVF. As an example, men who of embryo implantation failure in their who drink white wine often would have sperms with poor morphology by 43%, raise the chance of poor sperm

When it comes to trying to sperm is not the only factor will affect the success of IVF. cause sexual dysfunction, which interpersonal issues. Sexual

- Decreased sexual desire
- Sexual aversion disorder
- sexual contact
- Erection difficulty where the achieving or maintaining an
- Difficulty in achieving
- Premature ejaculation

For couples who are procedure to conceive, it that both parties control before and during the procedure. couples undergoing IVF should avoid least one month before the start of their IVF alcohol consumption would affect spermatogenesis, it male patients stop alcohol consumption 3 months prior to sperm maturation would take 3 months to complete.

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which is highly unstable and reactive An abundant amount of ROS marked by the presence of too with the body lacking sufficient circumstance will lead to cell,

where this metabolism process expressions that are involved fragmentation. Hence, sperms of

different types of alcohol on the reproductive system and the ingest beer daily show a higher rate female partners. Meanwhile, men an increased probability of producing while consumption of red wine would concentration by 23%.

conceive, the male partner's quality of influenced by alcohol consumption that Persistent use of alcohol is also known to would usually lead to marked distress and dysfunction may include:

- marked by avoidance of all genital
- individual would have a hard time erection
- orgasm

planning to undergo an IVF is highly recommended their drinking habits Doctors suggest that consuming alcohol at cycle. Additionally, since is recommended that pregnancy attempt, as







# Overview of Embryo Fertilization Techniques and Their Evolution Overtime

Robert Edwards along with Patrick revolutionized a new way for the treatment of fertility for couples who are trying to have a baby, through In-Vitro Fertilization (IVF). Before then, fertilization of oocyte outside of the mother's body is considered to be fully experimental and would usually result in miscarriage and failed pregnancy. IVF, however, had been widely used for animal breeding, but was still somewhat unachievable to be applied on human.

Not until the late year of 1978, when Louise Brown was successfully born through C section following the IVF experiment by Robert Edward when Lesley Brown seeks for his help after being diagnosed with primary infertility for 9 years. Following the birth of Louise Brown, the practice of IVF has continued to thrive across the globe. Today, through Assisted reproductive technology (ART), 2 million babies have been successfully born worldwide.

In Vitro Fertilization is usually recommended to women or couples who have been trying to conceive through unprotected sex for 2 years or who have taken 6 failed cycles of intrauterine insemination (IUI). It is suggested that women in their 20s and 30s will have the most success with IVF but there have been cases of success live birth through IVF from a woman at the age of 60s.

During an IVF procedure, the retrieval of eggs from the woman's ovaries is done and then the oocytes will be fertilized with the male's sperm outside of the woman's body, inside a laboratory dish.

The sperm and the oocyte will be left inside the dish to undergo natural fertilization on their own.

According to NHS, the success rate of IVF which yielded to live birth include:

- 32% for women >35
- 25% for women between 35-37
- 19% for women between 38-39

With the increased use of IVF as a treatment for female infertility, there was still a pending progress for fertility treatment on the male's factor. Conventional IVF will not be sufficient for the success of ART if the semen parameters were "disturbed". When the reference value for the sperm concentration, motility of the sperm, and morphology were below the requirement range, rate of fertilization will be significantly lower.

ICSI shorts for intracytoplasmic sperm injection is more widely used when the male patient's is the one having issue with their quality as well as quantity of the sperm. The technique was first described in 1992 and since then has been gaining popularity across the world.

In the beginning ICSI was introduced as a replacement for the unexplained fertilization failure but has now been widely used for the best treatment option for couples with male infertility issues.

Through ICSI, a single sperm is injected directly into the oocyte by the embryologist. ICSI requires the use of micromanipulators which has magnification up to 400 times, considering that the subject being handled is relatively very small.

The oocyte is held steadily using an equipment known as the holding micropipette and a tiny needle known as injection micropipette is used to inject the sperm into the centre of the egg.

The main difference between the traditional IVF and ICSI lies in the concept of human intervention. In traditional IVF, thousands of sperm ejaculated by the male patients is left inside a laboratory dish together with the eggs overnight to allow the fertilization to occur on their own. In the other hand, ICSI is done through the injection of a selected sperm into the egg, done by an embryologist.

In today's world, more and more women are delaying their age of childbearing with the intention to pursue their education and careers, not only that the age of marrying has now occurred way later in life. However, as known, the chance of getting pregnant naturally is decreasing with age hence why there is an increased demand for fertility treatment which in returns encourage more research to be done to optimize the IVF guidelines to improve the rate of success as well as pregnancy rates.

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Esco Medical has been dedicated to advancing the field of reproductive medicine for years now by continuously developing various technological solutions, and sharing new insights and experiences with IVF clinics and professionals across the globe.

The commitment of Esco Medical to fostering collaboration and sharing knowledge has played a significant role in driving innovation in the industry. By providing clinics and professionals with the latest advancements in reproductive technologies, Esco Medical has enabled them to offer their patients the best possible care and achieve higher success rates.

Through these efforts, Esco Medical has established itself as a leader in the field of reproductive technology, helping countless individuals and couples fulfill their dreams of starting a family.

### BACK-TO-BACK TIME-LAPSE WORKSHOPS

One of the efforts of Esco Medical in helping IVF Clinics/Laboratories is by conducting Time-Lapse Workshops, enabling participants to gain new insights and experience in using the time-lapse technology in incubators.

This March, Esco Medical ends the first quarter of 2023 with a bang by conducting a back-to-back time-lapse workshops in two key cities in Asia – Bangkok and Dubai.

### DUBAI – United Arab Emirates

The first Esco Medical time-lapse workshop for the year took place on March 2-3, 2023, at the Movenpick Hotel Bur Dubai, United Arab Emirates. This highly anticipated event was attended by hundreds of embryologists and fertility professionals from Western Africa and North Asia, who came together for two days of intensive learning activities.

Renowned experts in the field of reproductive medicine, Dr. Thomas Ebner, former ESHRE Board Member and IVF Lab Director of Kepler University, and Dr. Sanjay Bhojwani, Director and Global Head of Esco Medical Sales and Marketing, were the featured speakers at the workshop.

The Dubai TL Workshop was hosted by the Esco Dubai office.

### BANGKOK – Thailand

Following the successful Dubai TL-Workshop, Esco Medical continues its commitment to advancing the field of reproductive medicine by hosting another time-lapse workshop in Bangkok through the Esco Thailand local office.

The two-day event, which took place on March 23-24, 2023, at the Bangkok Marriot Marquis Queen Park, was attended by embryologists and fertility professionals from Southeast Asia, including

Thailand, the Philippines, Vietnam, Sri Lanka, India, Malaysia, Indonesia, and Singapore.

The workshop featured presentations from renowned experts in the field, Dr. Thomas Ebner and Dr. Sanjay Bhojwani, who shared their extensive knowledge and experience with the event attendees.

Overall, the workshops were a resounding success and a testament to Esco Medical's ongoing commitment to fostering collaboration and sharing knowledge to drive innovation in reproductive medicine.

To stay updated with our Time-lapse workshop schedules, please visit our website [www.esco-medical.com](https://www.esco-medical.com) subscribe to our newsletter (<https://www.esco-medical.com/newsletter-subscription>) or follow (@escomedical) on our social media pages.







## #EscoSpotted: Esco Medical Equipment Around the World

**Clinic/Lab: HAG Hospital & Fertility Center - Ghana**  
 Equipment: CelCulture® CO2 Incubator, MIRI® Multiroom Incubator, and Multi-Zone ART Workstation  
 Date: December 2022

**Clinic/Lab: Reproductive Biotechnology and Physiology Lab (Philippine Carabao Center) - Philippines**  
 Equipment: CelCulture® CO2 Incubator  
 Date: February 2023

**Clinic/Lab: Georgian-German Reproductive Center (GGRC) - Georgia**  
 Equipment: MIRI® Time-Lapse Incubator  
 Date: January 2023

**Clinic/Lab: Primaya IVF Makassar - Indonesia**  
 Equipment: MIRI® Time-Lapse Incubator, CelCulture® CO2 Incubator, MIRI® Multiroom Incubator, Multi-Zone ART Workstation, MIRI® AVT, Esco Laminar Flow, and CO2 Gas Analyzer  
 Date: March 2023

**Clinic/Lab: Care Fertility Clinic - Australia**  
 Equipment: MIRI® Time-Lapse Incubator  
 Date: January 2023



# MIRI® EVIDENCE

**AUTOMATED WITNESSING SYSTEM**

## The ultimate traceability tool for fertility clinics

MIRI® Evidence is redefining the way traceability in laboratory procedures is managed and stored in fertility clinics, eliminating errors, preventing system mix-ups, saving time, and helping clinics to comply with regulations. This tool provides a single, secure platform that ensures all patients are scheduled on time and documented properly - saving time and improving outcomes across the board.

*Visit [esco-medical.com](https://esco-medical.com) for the full product details*

### Key Features of Using MIRI® Evidence

#### Tracking

The scanners used with MIRI® Evidence are 2D imagers with no laser from a market-leading supplier and specially made for healthcare. The scanner can be used to scan wristbands, capture images, and photograph ID cards and passports.

#### Compliance

MIRI® Evidence Tracking has been made to comply with the EDQM guidelines and EU regulations. The workflow and tracking system assists the fertility clinic in documenting all procedures in the laboratory and office, thus excluding double-witnessing and saving time.

#### Workflow

The MIRI® Evidence workflow offers tools to enhance scheduling and documentation procedures, improving both clinical and administrative workflows in a fertility clinic. Once a patient's workflow has been started, the system automatically allocates the tasks. The combination of events determines the type of treatment.



#### Mix-up prevention

Oocytes, embryos, and semen samples are tracked and validated in and out of the containers eliminating the need for human double-witnessing. The validation guarantees that the correct sample is being processed and prevents patient samples from being mixed up.

#### Integration

Integration with other systems is as essential as it saves time and ensures the quality of exchanged information. The integration points range from patient demographic data, financial input/output, and image transfer to the exchange of laboratory results. The MIRI® Evidence similarly permits live video feed during ovum pickup, ICSI, or embryo transfer to a tablet or a display in the operation theatre.