

THE G-SERIES

Optimising embryo development in a protective in vitro environment

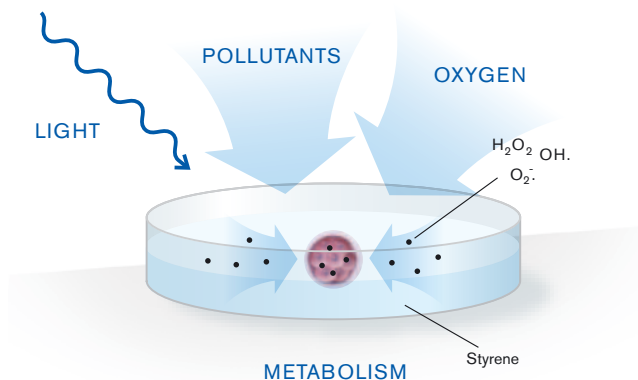
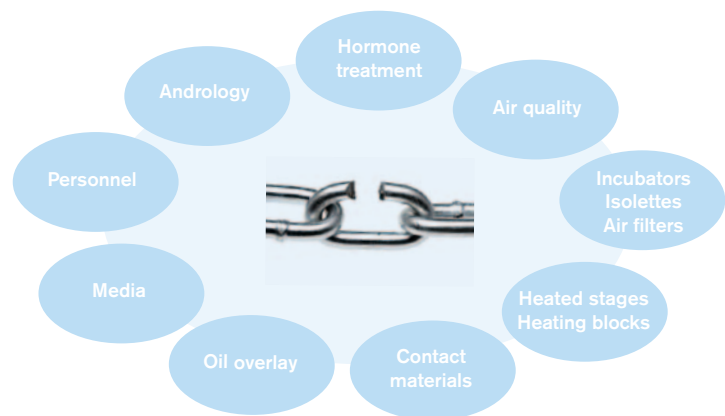


THE CHALLENGE

To obtain high pregnancy rates in the laboratory environment is one of greatest challenges one can undertake. But there are ways to step up to this task.

Factors affecting pregnancy rates

No chain is stronger than its weakest link. One suboptimal culture dish, a few minutes exposure to a pH level outside of the physiological range or incorrect levels of nutrients is enough to destroy an embryos chance to implant and result in a child.



Obstacles in vitro

Oocytes and embryos in the vitro environment are often exposed to:

- Fluctuations in pH and temperature.
- Reactive oxygen species (ROS) caused by suboptimal plasticware, light and oxygen.
- Cryopreservation.
- Risk of infection.

Meeting the challenges

- Check all laboratory parameters.
- Use mouse embryo tested products when available, media as well as disposables.
- Rinse disposables free from debris and possible embryo toxic substances.
- Use media that fulfill the requirements of the embryo and counteract the in vitro hazards.



IN VIVO

Everything the embryo needs is provided in vivo. Years of research has revealed the conditions in the female body that are essential for embryo development.

Learning from the mother

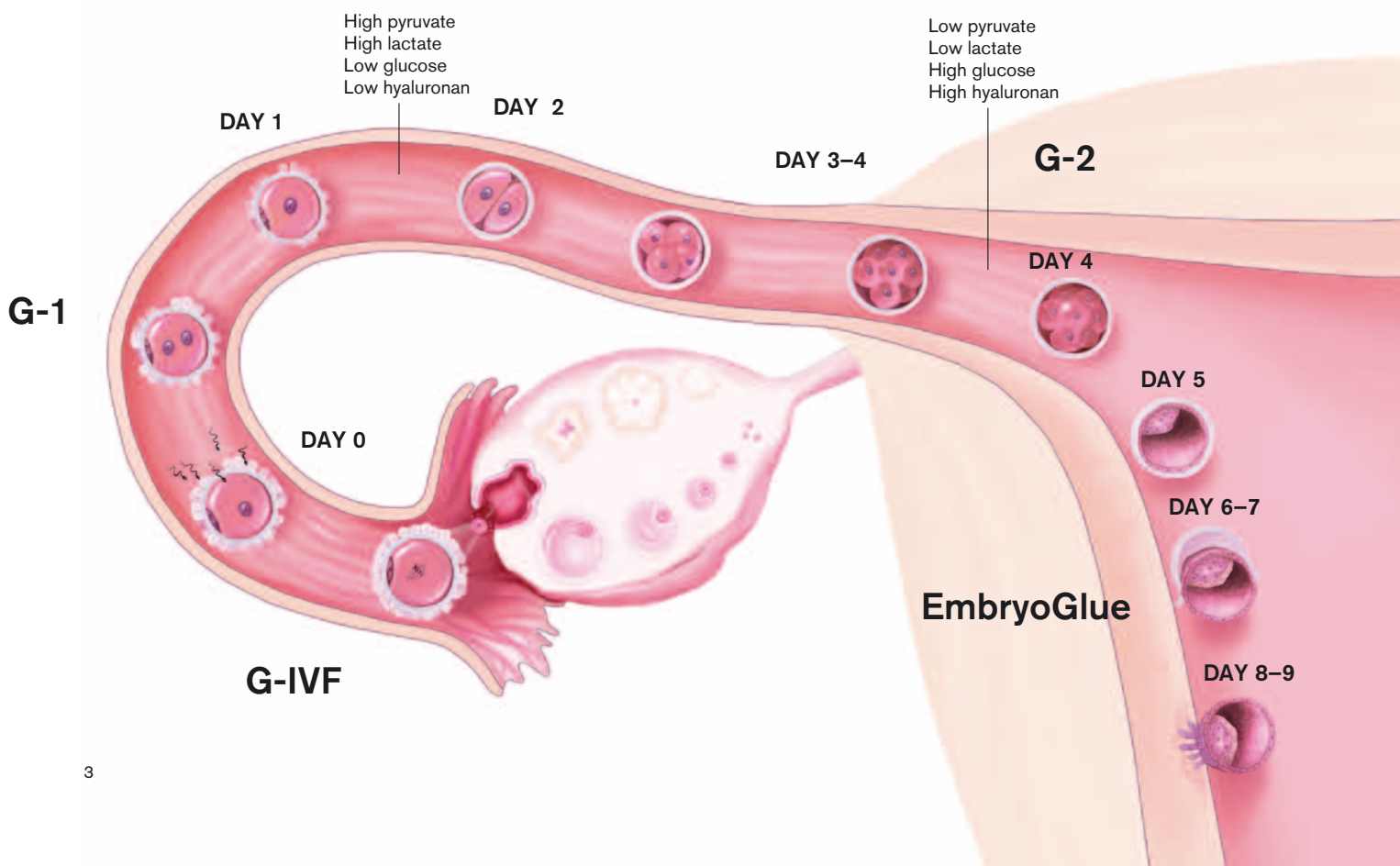
The physiological conditions in the female reproductive tract change from the ampulla of the oviduct to the uterus gradually.

In the ampulla, the concentrations of pyruvate and lactate are high while the concentrations of glucose and hyaluronan are low. In the uterus the conditions are reverse, pyruvate and lactate concentrations are low and glucose concentration is high. The concentration of hyaluronan reaches a peak in the uterus one week after ovulation, when it is time for the embryo to implant. These components have a significant impact on embryo physiology and viability.

Learning from the embryo

The conditions in the female reproductive tract are a reflection of embryo requirements. These requirements differ with the development stage of the embryo. The embryo before the 8 cell stage is still under the control of the maternal genome and the metabolic activity and the energy level needed is low.

In contrast, after compaction at the 8 cell stage, the embryo genome is switched on and the embryo needs higher levels of energy and nutrients, such as glucose and a wide array of amino acids.



THE G-SERIES

In nature embryos are supplied with correct nutrients and are protected from external stress factors by the mother. In vitro, they depend on you for protection and support.



Embryo support closer to nature

The G-Series is developed as a series of media products that each contains the appropriate nutrients for the development stage it is intended for.



In vitro protection

The G-Series with its built-in vitROSshield helps you protect embryos during culture and handling in the laboratory. VitROSshield protects from pH induced stress, free oxygen radicals, infections and cryodamage.



Same basic composition

All media in the G-Series are based on the same ionic composition, with the same osmolality and pH. This common set of ions prevents the intracellular stress the embryo is exposed to when being moved around in different solutions.



Hyaluronan for viability

Hyaluronan is an important component of the G-Series that supports the preimplantation embryo development, facilitates embryo implantation and improves cryosurvivability. It is the major glycosaminoglycan present in the follicular, oviduct and uterine fluids.

vitROShield components



+



+



+



pH corresponding with embryo intra-cellular conditions

To protect from perturbations in embryo development, the pH in the G-Series has been lowered to be close to the embryo physiological level.

Lipoate against free oxygen radicals

The unique addition of lipoate to the G-Series culture system will help to protect against ROS or "free oxygen radicals". Embryo development will thereby be less vulnerable in vitro.

Gentamicin against infection

Infection during embryo culture is a potential risk in laboratories around the world. To protect from possible infections, the broad spectrum antibiotic gentamicin is included in the G-Series.

Hyaluronan for improved cryotolerance

Hyaluronan and recombinant human albumin can significantly improve embryo cryosurvivability.

COMPLETE

The G-Series has been developed to meet the embryo's needs and to protect its development in vitro. The media covers all steps from aspiration to transfer, with the same basic composition.

G-RINSE is used for removal of debris in needles, dishes and tubes, which can perturb embryo development.

G-MOPS and G-GAMETE are pH stable handling media to support oocytes and embryos outside of the incubator.



G-IVF contains all components necessary to support oocyte and sperm function during fertilisation.

G-1 provides the carbohydrates, amino acids and hyaluronan to support the embryo during the first critical stage of development.

G-2 provides the embryo with a wide range of amino acids and hyaluronan for blastocyst development.

EmbryoGlue promotes implantation. Its high concentration of hyaluronan mimics the conditions in the uterus at the time of implantation.

Use the complete system for optimal results

By using the entire G-Series from aspiration to transfer you can be confident you are providing the best for the embryo in every step. Every product in the G-Series is developed to resemble the different conditions of the female reproductive tract and fulfill embryo requirements.

* G-GAMETE not approved by the TGA.

IT WORKS

The unique composition of the G-Series has helped many clinics all over the world to receive high implantation and pregnancy rates.

Multicentre evaluation Aug 2008– March 2009

Background

A multicentre evaluation was performed during the autumn and winter of 2008–2009. During this period, all clinics worked according to their own laboratory protocols and data was submitted to Vitrolife upon request. There were 7 clinics from 5 countries that provided data, and 1567 embryos from 988 patients were included. Most embryo transfers were performed at the cleavage

stage (670/988) but a considerable number of blastocysts transfers were also included (318/988). Mean number of cleavage stage embryos for transfer was 1.4 and for blastocysts 1.9. The higher number of blastocysts transferred is due to the policy of the participating clinics.

Results

See Fig 1.

Conclusion

The G-Series performs well in different clinical settings worldwide and high pregnancy and implantation rates can be obtained for transfers at both the cleavage stage and the blastocyst stage.

Fig 1.

	No of patients	No of embryos	Embryos/transfer	Clin. preg. rate(%)	Impl. rate (%)
Day 2/3 transfers	670	952	1.4	45	34
Blastocyst transfers	318	615	1.9	55	40

Vitrolife. Data on file. 2009.

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