Device and a method for manipulating animal embryos in a process of cryopreservation

Summary

We have developed a support to be used in the veterinary field, specifically in embryo cryopreservation of farm embryos and their direct transfer to the female recipient. This new tool allows to approach the vitrification technique to the field of veterinary production through a simple process that includes direct warming and embryo transfer. The device includes an embryo attachment support where the embryo is loaded, a hard plastic handle and a cover straw that will work as a 0,25 mL french straw for the dilution of the cryoprotectant agents and for the later transfer of the embryo to the recipient in situ, in the field.

This technique allows better results and is faster and cheaper than slow freezing, and no additional equipment or experience are necessary to perform the whole process.

We are seeking for a company partner to further develop the technology through a co-development and license agreement.
We are seeking a company partner to further develop the technology through a co-development and license agreement.

Innovative aspects and applications

> This device allows for the first time vitrified embryos to be warmed and transferred directly into a recipient in situ, in the farm.
> This support allows direct warming of vitrified embryos into a french straw that will allow the dilution of cryoprotectant agents and the later transfer of the embryo directly into the uterus of the recipient.
> Embryo warming and transfer are easily achieved in a simple and low-cost way without need of previous experience on embryology or the use of optical equipment.

State of development

We have measured the effectiveness of the new developed devise in terms of embryo recovery and in vitro survival after in-straw cryoprotectant dilution of vitrified in vitro-produced bovine embryos Recovery rate, defined as the percentage of blastocysts retrieved from the straw after warming, was 77.4% while 61.5% of the warmed blastocysts developed to the expanded or hatched blastocyst stage after 24h of in vitro culture.

IP Rights

EP10380072 filed on May 21st, 2010
PCT/EP2011/002529 filed on May 20th, 2011
Patent pending in USA, Canada, Europe, Japan, Brazil, Australia and Argentina.

Ongoing research

From now on, the ongoing research will include:

>Validation of the effectiveness of the device directly at the farm. We will transfer in vitro produced bovine embryos vitrified/warmed at the farm using the new developed devise for the whole process. After 40-42 days, pregnancy rate will be evaluated
Such experiments are expected to be carried out during 2Q 2013

Device and a method for manipulating animal embryos in a process of cryopreservation

The Invention

We propose the use of a new device for embryo vitrification that allows warming and embryo transfer could be performed directly at the farm. This new device includes an embryo attachment support where the embryo is loaded, a hard plastic handle and a cover straw which protects the device from mechanical damage during storage and works as a straw for the dilution of the cryoprotectant agents and for the later transfer of the embryo, without need of previous experience on embryology or the use of a stereomicroscope

Cryopreservation of embryos is a crucial step for widespread and conservation of animal genetic resources. Vitrification has become a viable and promising alternative to traditional approaches because it does not require expensive programmable embryo freezers and long equilibration periods.

To date there such device does not exist in the market. Our technology allows direct warming of vitrified embryos and direct transfer to a recipient at the farm.

This technology provides for the first time the opportunity of transfer vitrified embryos in a farm.

Fig. 1. The devise comprises a portion for loading the embryo, a channel arranged for conducting a warming solution, a handle portion and a connector for connecting the device to the warming solution source.

Fig. 2. Cover straw attached to the device allows dilution of cryoprotectants and direct embryo transfer.

Scientific References

A step to develop a novel vitrification devise for embryos: new warming protocol for vitrified bovine blastocysts. Proceedings of the 27th Scientific Meeting of the European Embryo Transfer Association, 188. 2012.

One-step cryoprotectant dilution following vitrification of in vitro-produced bovine embryos. Reproduction, Fertility and Development 25(1):182. 2012.

New devise for vitrification and in-straw warming for direct transfer of bovine in vitro produced embryos. The 3rd International Congress on Controversies in Cryopreservation of Reproductive cells, Tissue and Organs (CRYO). Berlin, Germany, 2013

UAB Universitat Autònoma de Barcelona

Contact Details

Lucas Martín Pinardi

T. +34 935 868 923 F. +34 935 812 841 patents@uab.cat

UAB Technology Transfer Office.

Campus Universitari UAB. Eureka Building s/n. 08193 Bellaterra. Barcelona. Spain