Probl Cryobiol Cryomed 2023; 33(4):283
https://doi.org/10.15407/cryo33.04.283

Вплив різних температур відтавання та умов консервування на швидкість відновлення кріоконсервованих дендритних клітин коня

Т. Діб[1,2], Ф. Швебель[3], Т. Ріттінгхаус[1], Б. Гласмахер[1,2]
[1]*Інститут багатофазних процесів, Ганноверський університет імені Лейбніца, м. Гарбсен, Німеччина*
[2]*Нижньосаксонський центр біомедичної інженерії, досліджень і розробки імплантатів, м. Ганновер, Німеччина*
[3]*PetBioCell GmbH, м. Остероде-ам-Гарц, Німеччина*

The Effect of Varying Thawing Temperatures and Preserving Conditions on the Recovery Rate of Cryopreserved Equine Dendritic Cells

T. Deeb[1,2], F. Schwebel[3], T. Rittinghaus[1], B. Glasmacher[1,2]
[1]*Institute for Multiphase Processes, Leibniz University Hannover, Garbsen, Germany*
[2]*Lower Saxony Centre for Biomedical Engineering, Implant Research and Development, Hannover, Germany*
[3]*PetBioCell GmbH, Osterode am Harz, Germany*

Cell therapies have gained increasing importance in tumor treatment over the last decades. Treatment with dendritic cells as an alternative to conventional therapies is being actively researched and shows promising potential. Clinical availability of this treatment may be improved through cryopreservation of the cultivated cells. The objective of this study is the validation of higher thawing rates of the cells by employing passive warming techniques. After establishing a control protocol for the cryopreservation of equine dendritic cells by using a cryoprotective agent consisting of 10% (v/v) DMSO and 90% (v/v) autologous serum and a cooling rate of 1 K/min, we were able to demonstrate that thawing samples in a water bath at relatively high temperatures (323.15 K and 338.15 K) enhanced the recovery rates significantly. Additionally, we showed that the utilization of passive cooling devices instead of controlled rate freezers and storing the samples at 193.15 K for up to 12 weeks did not affect the recovery rate significantly. For the future we aim to establish a DMSO-free cryopreservation protocol and to validate it for the above-mentioned conditions.

Probl Cryobiol Cryomed 2023; 33(4):283
https://doi.org/10.15407/cryo33.04.283a

Хетчинг кріоконсервованих бластоцист людини, отриманих у циклах ЕКЗ та ІКСІ

Н. Шаповалова[1], Т. Юрчук[1], В. Піняєв[1,2], М. Петрушко[1,2]
[1] *Інститут проблем кріобіології і кріомедицини НАН України, м. Харків, Україна*
[2]*«ДРТ-Клініка репродуктивної медицини», м. Харків, Україна*

Hatching of Cryopreserved Human Blastocysts Obtained in IVF and ICSI Cycles

N. Shapovalova[1], T. Yurchuk[1], V. Pinyaev[1,2], M. Petrushko[1,2]
[1]*Institute for Problems of Cryobiology and Cryomedicine of the National Academy of Sciences of Ukraine, Kharkiv, Ukraine*
[2] *ART-clinic of human reproduction, Kharkiv, Ukraine*

The embryological stage of assisted reproductive technology programs allows for the fertilization of oocytes using IVF and/or ICSI techniques. The aim of the study was to determine the effect of the method of oocyte fertilization on embryological parameters, in particular on the frequency of blastocyst hatching. A retrospective cohort study of embryological characteristics was conducted depending on the method of oocyte fertilization: group 1 – fertilization was performed by IVF, subsequent cultivation and cryopreservation of embryos with minimal denudation of cumulus cells (n = 206) and group 2 – fertilization was performed by ICSI with complete removal of cumulus cells (n = 400), followed by cultivation and cryopreservation of fully denuded embryos. Reproductive cells were obtained from patients undergoing infertility treatment with their written, informed consent. Oocytes and embryos were cryopreserved using the Cryotop vitrification method.

There was no significant difference in the clinical characteristics of patients whose oocytes were included in groups 1 and 2. However, the frequency of fertilization of oocytes from group 1 was significantly lower compared to group 2 ($p < 0.05$). The morphokinetic characteristics of embryos in the study groups were identical: the number and quality of blastocysts obtained in the groups did not differ significantly ($p \geq 0.05$). The survival rate of embryos after vitrification and the frequency of blastocysts' hatching in group 2 was significantly higher compared to group 1 ($p < 0.05$).

The method of oocyte fertilization plays a role in further embryological events. The role of cumulus cells in the processes of fertilization, developmental kinetics, cryoresistance and hatching is possible.