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Скорочувальна здатність матки у старих щурів після введення кондиціонованого середовища з кріоконсервованої культури гліальних клітин

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Uterine Contractility in Aged Rats After Administration of Conditioned Media From Cryopreserved Glial Cell Culture

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Neuroplasticity of the uterus and the implementation of contractile function depend on neurotrophic factors (NF). Physiological regulation of uterine contractility decreases with age. One of the modern approaches to correct the function of the female reproductive system is the use of conditioned media (CM) from cell cultures. Conditioned media from glial cell culture containing neurotrophic factors (NTFs) can be used for this purpose. The experimental study is based on the idea that under the influence of exogenous neurotrophic and other growth factors of CM the contractile apparatus of the myometrium is reorganized and its sensitivity to specific stimuli is increased. It is well known that cryopreservation leads to a decrease in cell viability, modification of their proliferative and functional activity. Modern cell culture technologies include cryopreservation. Therefore, there is a need to evaluate the biological properties of the CM obtained from the cryopreserved culture.

The aim of the study was to evaluate the effect of CM obtained from intact and cryopreserved cultures of glial cells on the contractile activity of the uterus in rats of different reproductive ages.

Cell culture was obtained from the dorsal root ganglia of neonatal piglets and cryopreserved in DMSO-based cryoprotectant medium. CM from native and cryopreserved cultures were collected for 28 days, then the fractions with a molecular weight of <30 kDa were obtained by ultrafiltration. Rats at the age of 6 (reproductive age, RA) and 14 (late reproductive age, LRA) months were intraperitoneally injected with 0.2 ml of ultrafiltrated media for 9 days. The animals were slaughtered on the 30th day. The spontaneous and oxytocin-induced uterine contractile activity was determined by the organ bath method; the relative area of the myometrium was assessed by histological method; the average area of labelling with specific antibodies to smooth muscle actin was done by IHC. The statistical significance of differences was assessed by the Mann-Whitney test.

It was found that spontaneous and oxytocin-induced tension of isometric contraction (TIC) decreased by 19 and 14%, respectively, in the uterus of intact LRA rats. Normalization of TIC was observed after administration of CM from cryopreserved as well as native glial cell cultures. This effect was realized against the background of an increase of smooth muscle actin expression and myometrium area.

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Кріоконсервування дендритних клітин для лікування раку

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Cryopreservation of Dendritic Cells for Cancer Therapy

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In recent decades, cell therapy has become increasingly important as a complementary approach to cancer treatment. Dendritic cell therapy shows great potential for the treatment of cancer. Better availability of this cell therapy should be ensured by cryopreservation. The project is dedicated to the investigation of a supply chain model in which equine dendritic cells derived from monocytes are first cultured, shipped and cryopreserved. Then, the samples are thawed and shipped back after three specific time periods corresponding to the real therapeutic process. In total, the quality, as well as the quantity (automatic cell counting as well as vitality determination) of 76 samples from four different animals, is evaluated before and after the cryopreservation process in terms of storage time, concentration, and total volume. Here, a composition of 5 million cells in 1 ml seems to be the most suitable for the procedure and provided better results (overall vitality ≥78%). In addition, isotonic saline was found to have the potential to replace autologous plasma in cryoprotectants.