Shu Z., Heimfeld S., Gao D. 2014. Hematopoietic SCT with cryopreserved grafts: adverse reactions after transplantation and cryoprotectant removal before infusion. Bone Marrow Transplant. V. 49. P. 469.

Stiff P.J., Murgo J.A., Zarolus C.G. 1987. Unfractionated human marrow cells cryopreservation using dimethylsulfoxide and hydroxyethyl starch. Cryobiology. V. 20. P. 17.

Thanyaphong N., Traver B., Weissman I., Akashi K. 2002. Myeloerythroid-restricted progenitors are sufficient to confer radioprotection and provide the majority of day 8 CFU-S. J. Clin. Invest. V. 109. P. 1579.

Wei Q., Frenette P. 2018. Niches for hematopoietic stem cells and their progeny. Immunity. V. 48. P. 632.

Fluorescent Visualization of the Dynamics of Donor GFP$^+$-Cells Distribution in Mouse Organs after Native or Cryopreserved Bone Marrow Transplantation

L. A. Sergievich[a], *, E. V. Bogdanenko[b], A. V. Karnaukhov[a], N. A. Karnaukhova[a], and I. A. Lizunova[a]

[a] *Institute of Cell Biophysics Russian Academy of Sciences, Pushchino, Moscow reg., 142290 Russia*

[b] *Institute of General Pathology and Pathophysiology, Moscow, 125315 Russia*

**e-mail: larserg@mail.ru*

Cryopreservation is the only way to preserve host's bone marrow stem cells (BM) for use in regenerative medicine or before ablative therapy of malignant diseases. The transplantation of BM own stem cells (autotransplantation) has not been sufficiently studied in terms of the interaction of the transplanted cells with the host (recipient) organism. Therefore, the aim of this work was to evaluate the effectiveness of syngeneic transplantation, as a model of autotransplantation, native or cryopreserved BM in sublethally irradiated recipient mice. Mice carrying the green fluorescent protein (GFP) gene, bred on the basis of the C57BL/6 inbred strain, were used as donors, and C57BL/6 mice were used as recipients. The dynamics of the chimerism level in the organs of the lymphomyeloid complex of the blood system (bone marrow, thymus, spleen, blood and large intestine) in recipient mice at different terms after transplantation of native or cryopreserved GFP$^+$-cells of the donor's whole syngeneic BM was studied by the fluorescence microscopy. Differences in the ability to engraft the organism with GFP$^+$-cells were estimated by their percentage value in the suspension of BM, spleen, and thymus cells of the recipient. GFP$^+$-cells in recipients who received thawed BM appeared in the studied organs 7–8 days later than in recipients after native BM transplantation. However, 14–21 days later after transplantation, the relative number of the donor cells in the studied organs of the recipients of both groups did not significantly differ. The chimerism was detected in the tissues of whole organs or their cross-sections (BM, spleen, thymus, intestine) earlier than in the suspension of these organs after transplantation. It was also shown that the mesenchymal cells of the donor BM are involved in the stroma repair of all studied organs damaged by radiation, as evidenced by the presence of fibroblast-like GFP$^+$-cells in them, especially significant in the thymus of the recipients of both groups. Thus, our studies have shown that the BM cells cryopreserved according to the used method were sufficiently viable to achieve the effective histogenesis of the investigated organs of the blood system.

Keywords: autotransplantation, bone marrow, spleen, large intestine, thymus, cryopreservation, fluorescence microscopy, GFP