исследовательских организаций. План исследования одобрен локальным этическим комитетом Института экологии и генетики микроорганизмов УрО РАН (протокол № 24/1 от 04.07.2023). От каждого из включенных в исследование участников было получено информированное добровольное согласие.

КОНФЛИКТ ИНТЕРЕСОВ

Авторы заявляют об отсутствии конфликта интересов.

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ANALYSIS OF CRYOPRESERVATION IMPACT ON MONONUCLEAR LEUKOCYTE METABOLISM

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Studying the metabolic activity of mononuclear cells (MNCs) is crucial in biology and medicine. Cryopreservation is commonly used to store samples for long-term research, which helps minimize errors. However, the impact of low temperatures on MNCs metabolism remains understudied. The aim of this study was to investigate the effects of cryopreservation on glycolysis and oxidative phosphorylation in MNCs. Using the Seahorse XFe96 analyzer, we measured the metabolic parameters of cryopreserved MNCs via extracellular flux analysis. The results showed a significant decrease in the rate of oxidative phosphorylation in cryopreserved MNCs, without changes in MNC subset composition. Importantly, cryopreservation did not impact the rate of glycolysis. However, thawed cells exhibited reduced ability to increase metabolic rates in response to mitogenic stimulation. In conclusion, cryopreservation alters the metabolic profile of MNCs. To obtain reliable data on metabolic activity, the use of freshly isolated cells is preferable.

Keywords: mononuclear leukocytes, cryopreservation, metabolism, glycolysis, oxidative phosphorylation