

GENERATION OF HUMAN INDUCED PLURIPOTENT STEM CELLS FROM HAPLO-SELECTED CORD BLOOD SAMPLES

Aleksandar Petlichkovski, Meri Kirijas, Gorjan Milanovski, Olivija Efinska Mladenovska, Kristina Stamatovska

Institute for Immunobiology and Human Genetics, Medical Faculty in Skopje, Republic of North Macedonia

HAPLO – IPS is a collaborative network within the COST actions program, aimed to providing a framework for hiPSC, homozygous for frequent HLA haplotypes compatible with a significant percentage of the population in order to be used for cell therapy.

The use of allogeneic induced pluripotent stem cell (iPSC)-derived cell therapies for regenerative medicine offers an affordable and realistic alternative to producing individual iPSC lines for each patient in need. In contrast to embryonic stem cells (ESCs), the use of iPSCs is not as hampered by ethical considerations, and consequently can be used without restriction given appropriate informed consent, which has favored their use in recent years. HLA homozygous iPSC matched in hemi-similarity could provide cell therapies with reduced immune rejection covering a wide range of the population with a few iPSC lines. Several banks of HLA homozygous iPSC (haplobanks) have been already established worldwide, to provide the clinical grade starting material for cells therapies, covering the top HLA haplotypes for specific populations. Harmonizing the quality standards among haplobanks and creating a global registry could minimize the collective effort and provide a much wider access to HLA-matched cell therapies to patients with less frequent haplotypes.

To benefit patients world-wide, clinical grade haplolines need to be available for advanced therapy developers and manufacturers. Harmonizing haplobanks will require setting common standards of different aspects such as starting cell procurement, GMP manufacturing and quality control. This would eliminate the costly and time-consuming need of creating personal iPSCs for each patient.

E-mail: aleksandar.petlichkovski@medf.ukim.edu.mk