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(WO/2005/109199) METHOD FOR SELECTIVELY EXPANDING, SELECTING AND ENRICHING STEM/PROGENITOR CELL POPULATIONS

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Background of the Invention

A method of producing stem/progenitor cells from human or animal origin. A population, from an embryonic, fetal or adult source, preferably from bone marrow, blood, fat, muscle, heart, intestine, kidney, liver, lung, pancreas, skin or neural tissues, that includes stem/progenitor cells, is treated with one or more first cytostatic or cytotoxic agents to which the stem/progenitor cells are less sensitive than the other cells of the population. Preferably, the agent(s) selectively deplete(s) from the population cells that are negative with respect to expressing a transporter gene of the first agent(s) while sparing cells that are positive with respect to expressing that gene. Preferably, the population also is treated with one or more cytokines and/or growth factors.

The Need

Successful ex-vivo expansion of stem and progenitor cells could be exploited for a variety of clinical applications. In the light of this, there is a critical need in the invented method for ex-vivo expansion of high quality and economic enriched stem cell populations.

Potential Applications

The invented could be suitable for both autologous and allogeneic transplantations as it will result in a reduction of the volumes of transplants to be cryopreserved. Also useful in the ex-vivo expansion of the following stem cells: bone marrow, peripheral blood, umbilical cord blood (UCB), myoblasts, cardiomyoblasts, hepatic stem cells, neural stem cells, mesenchymal stem cells, endothelial stem cells, embryonic stem cells, fetal stem cells or any other type of pluripotent stem cells that express this property (i.e., relatively higher resistance to cytostatic/cytotoxic agents).
These ex-vivo expanded stem cells (undifferentiated or differentiated) could be accessible as single cell types with ideal properties as donor cells for diverse applications of cell transplantation and gene therapy

Advantages

Non-toxic procedure (safety); Economic relatively to other procedures; improve both quantity and quality of products; Stand alone procedure that can be integrated with other procedures; applicable to any ABC-transporters expressing stem cells; production of various cell products for cell and gene therapy. Its use will also be advantageous in stem cells- and cancer- research and clinical applications due to its lower cost as compared to stem cells enrichment techniques based on antibodies.

Development Stage

Research and development; pre-clinical

Patent

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