Your Name

Instructor Name

Course Number

Date

Stem Cells

Stem cells are the precursors of all the cells and tissues of living body. Stem cells are able to maintain their number through division and have the skill to differentiate (transform) into dissimilar kinds of cells. With age, the number of stem cells in the human body decreases. Lessening of stem cells because of aging, serious diseases or bad habits (smoking and drinking alcohol) divests the living body of the possibility of self-treatment. As for this, the functioning of definite organs may be disrupted.

Individuals stem cells are conditionally separated into mesenchymal and hematopoietic. Hematopoietic (hematopoietic) stem cells (HSC) form a variety of blood cells that determine immunity, fight infections, carry oxygen and participate in blood clotting processes. The history of the clinical application of hematopoietic stem cells began above 60 years ago, and nowadays hematopoietic stem cell movement is the primary special method in the dealing of hematological, some oncological, and a number of immunological and hereditary illnesses. The hematopoietic stem cells may be attained from the peripheral blood, bone marrow, (after the introduction of special drugs) and from umbilical cord blood (Reya, 34)

Often the patient simply does not have period to interval for the call of a bone marrow donor, repeated analyzes and preparation of the donor for the bone essence collection, moreover, given the stringent wants for matching the donor's and the patient's HLA genotype, it is not for everyone to pick up a bone marrow example. In such examples, cord blood transplantation is not just an another to bone marrow transplantation, however the only chance for the patient. Mesenchymal (stromal) stem cells (MSCs) are able to transform into cells of bone, cartilage, connective tissue, to form elements of blood vessels. In addition to replenishing the lost elements of these tissues, mesenchymal stem cells synthesize a large set of biologically active substances with which they can change the behavior of other types of cells, for example, cells of the immune system (Moore, 1880).

These cells are unique, they are used in the treatment of more than 80 serious diseases, including cancer, leukemia, lymphoma and specific disorders of the immune system. In case of certain oncological diseases, such as leukemia, the presence of prepared cord blood with stem cells makes it possible not to search for a suitable donor for transplantation. With age, the number of stem cells decreases, and, accordingly, the restorative capabilities of the body decrease. To date, it has become possible to preserve stem cells for many years. The trunk at the root of the tree symbolizes stem cells with great potential; they can turn into all specialized cells of any organs and tissues. There are more than 200 types of such cells in our body. And for such a powerful potential, these stem cells are called pluripotent. These include embryonic stem cells.

Stem cells can also support the figure heal when it is broken. Stem cells differ from ordinary ones in that they can live incessantly. As people gap, provide offspring both stem cells and various kinds of specialized cells characteristic of the muscles, heart, liver, mind and other structures and tissues. For clarity, the scheme of division and development of cells in our body can be compared with a tree trunk. Where thin branches are these specialized cells. If these are muscle cells, they contract and provide us with movement, if there are brain cells, they are responsible for thinking and regulating many processes, if they are liver cells, then they neutralize toxic substances and synthesize a mass of different molecules that our body needs. But all these specialized cells have a limited lifetime. They give no offspring and cannot transform into other cells - this is a kind of dead end of development.

Works Cited

Moore, Kateri A., and Ihor R. Lemischka. "Stem cells and their niches." Science 311.5769 (2006): 1880-1885.

Reya, Tannishtha, et al. "Stem cells, cancer, and cancer stem cells." nature 414.6859 (2001): 105.