

Institute for Immunology and Thymus Research Laboratory for Autologous Adult Stem Cell Research and Therapy

Rudolf-Huch-Str. 14
D- 38667 Bad Harzburg
Tel: +49 (0)5322 96 05 14
Fax: +49 (0)5322 96 05 16
www.thymustherapy.com
pesic@thymustherapy.com
www.stemcell-therapy.org
info@stemcell-therapy.org

Stem Cell Treatment

Stem cell therapy has taken center stage in current international biological and medical research

During the last 5 years the use of stem cells, which have been researched in theory as well as in laboratory and animal experiments, has been expanded to application in humans. This use is documented in extensive national and international academic literature. (Currently, an internet research alone, turns up more than one hundred thousand titles.) Many research centers have reported successful stem cell therapy for various illnesses.

What are stem cells?

Stem cells are life's "library" and "construction workers" and effect significant renewal and healing of the entire organism.

A distinction is made between embryonic stem cells (their use in Germany for research and therapy is forbidden) and autologous (one's own) adult stem cells, which can be gathered from various organs such as bone marrow, umbilical cord, or circulating blood. Recently, there has been frequent reports about reprogrammed stem cells from skin.

The stems cells that we gather in our laboratory are taken from the circulating blood or bone marrow of the patient. The stem cells are testing according to the requirements, fulfill the therapeutic as well as the ethical prerequisites, and have already proven themselves to be a useful therapeutic agent. These stem cell are allow to be administered to humans in Germany.

In 2005 our laboratory was set up with the latest equipment. The lab has been standardized, qualified, validated, and optimized for the treatment of patients.

For which illnesses are stem cells used?

In our laboratory the main focal points are:

- u geriatric illnesses
- u heart diseases
- u liver diseases
- u diabetes mellitus type II
- u nerve and muscle diseases

How is stem cell therapy done?

First, a detailed medical history of the patient is needed and a complete check-up is conducted. Then, with the help of EDTA tubes, 50 - 70 ml of whole blood are drawn from the patient. The patient must not have eaten before hand (fasting), so before breakfast.

To prevent the blood from clotting and to guarantee a uniform concentration of blood cells, the EDTA tubes containing the whole blood are treated in a mechanical mixer as the first step.

After 15 minutes the whole blood is further processed. Approximately 2ml of whole blood are needed for the diagnostics that are conducted simultaneously (immune status via flow cytometry, differential blood count - Pappenheim staining, CD34+ cell determination).

The whole blood for the stem cell isolation is diluted at least twice with a PBS solution and then mixed with a lymphocyte separation medium in a sterile, 50 ml tube. Peripheral blood mononuclear cells (PBMC) are extracted during this step. After two washing steps, the PBMC are counted under a light-optical microscope. Proportionately to their number, the cells are resuspended in a buffer (PBS; 2Mm EDTA) and prepared further for MACS isolation (a special method for stem cell isolation).

The MACS technique makes specific magnetic binding of the desired cells possible. In our case, these are always the CD34+ cells. The corresponding volume of CD34+MacroBeads are given to the PBMC suspension and allow the desired cells to be marked. After 30 minutes of incubation, the cells are washed, resuspended in a buffer, and applied on the MS column. The CD34+ cells remain in the column. They are obtain through elutriation of the column. The CD34+ cell count is determined using a flow cytometer and CellQuest Pro software (ISHAGE protocol).

The cells are then placed in a cell culture and cultivated for 5 to 7 days so that the cells multiply. The cell culture contains the needed cytokine (cell factors) such as GM-CSF; IL-3, TPO, SCF, and flt-3L. The medium contains no antibiotics and is filtered through a 0.22µm sterile filter. They are then prepared to be implanted in the patient.

After cultivation the cells are collected, washed in NaCl, counted, resuspended in 2 ml, and injected in the patient's upper arm as a cell suspension.

The immune status of the patient is checked at 3 and 6 months after the stem cell therapy.

How successful is stem cell therapy?

As of September 2010, 63 patients have been treated in our laboratory with stem cells. Over 90% of the patients have responded positively to the treatment.