



TECHNOLOGY

Adult Stem Cells

Adult tissues contain a variety of stem cells, which represent a select type of unspecialized cells with the ability to divide themselves for indefinite periods (self-renewal) and to become, under certain physiological conditions (provided by specific microenvironments or niches), tissue-or organ-specific cells with distinctive function.

Given their unique regenerative abilities, stem cells offer an enormous potential for cell-based therapies to treat disease, which is also referred to as **regenerative** or **reparative medicine**.



Adult Stem Cells

Adult stem/progenitor cells have been identified in many organs and tissues, including bone marrow. In this tissue, reside at least three main types of stem cells:

- **Hematopoietic (HSC)**

Cells that form all the types of blood cells in the body

- **Mesenchymal (MSC)**

Cells that can generate bone, cartilage, fat, muscle and other cell types

- **Endothelial Progenitor Cells (EPC)**

A heterogeneous group of cells with the capacity to form new blood vessels



Adult Stem Cells

Typically, there is a very small number of each type of stem cells in the bone marrow; therefore, for the utilization in cell therapy, it is necessary to develop methods to grow large quantities of these cells (ex vivo expansion).

TCA-CT has developed the technology for the purification and/or expansion of specific types of stem cells present in the patient's bone marrow, in order to prepare a cell product containing either a single and/or a combination of autologous (patient's own) stem cells to treat various diseases.



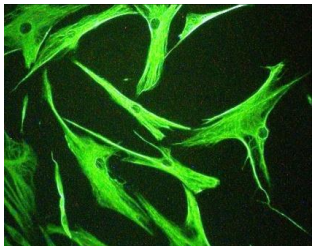
TCA-CT Procedure



Step 1: Bone Marrow is Drawn from the Patient's Iliac Crest (Rear Hip) in an In-Office Procedure.



Step 2: MSCs are Separated, Ex Vivo Expanded and Tested at the TCA-CT GMP Laboratory.



Step 3: Depending on the Disease, the Proper Cell Product is Prepared for Infusion, Over Approximately a 2-3 Week Period.

TCA-CT Procedure



Step 4: CELL PRODUCT INFUSION

Depending on the Type of Disease, the Cell Product is Infused, via:



- **Intracardiac, Intracoronary or Transendocardial (Noga/Myostar)**
- **Intramuscular (Gastrocnemius Area)**
- **Intrathecal**

TCA-CT Applications

- **Cardiac Diseases –**
 - **Severe Coronary Ischemia Phase II -ONGOING**
 - **Myocardial Infarction -COMPLETED**
- **Peripheral Arterial Disease –**
 - **Limb Ischemia Phase I – COMPLETED**
 - **Limb Ischemia Phase II – COMPLETED**
 - **Limb Ischemia Phase III – IN PREPARATION**
- **Neurological Diseases –**
 - **Amyotrophic Lateral Sclerosis (ALS) –ONGOING**
 - **Spinal Cord Injuries –ONGOING**
- **Future TCA-CT Applications –**
 - **Multiple Sclerosis**
 - **Stroke**
 - **Muscular Dystrophy**
 - **Cerebral Palsy**
 - **Skeletal Diseases**





ADULT STEM CELL CLINICAL TRIAL PROGRESS REPORT

