

TRANSCOMM

KEYWORDS

Mesenchymal stem cells
 Regenerative medicine
 Osteoarthritis
 Ischemic stroke
 Muscular dystrophy

Stem cells: Mankind's answer to Prometheus' vulture



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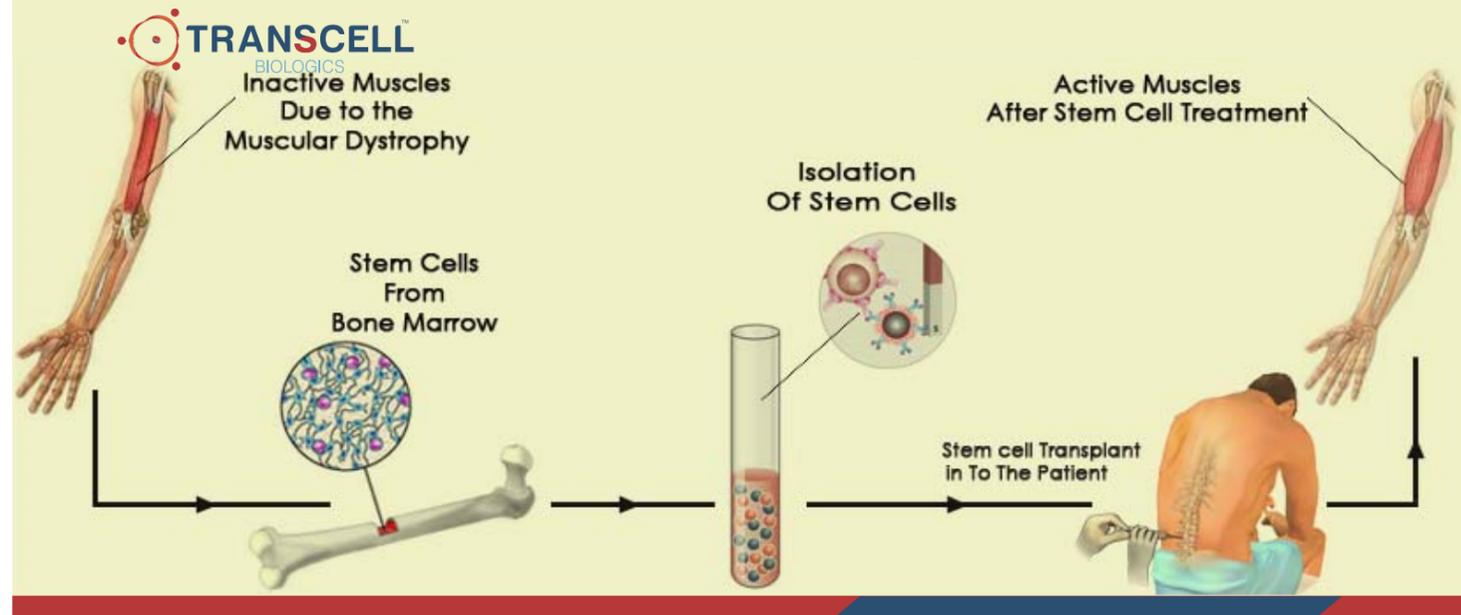
Prometheus is a Titan in Greek Mythology, best known as the creator of mankind and it's greatest benefactor. He transgressed the law of gods and stole fire from Mount Olympus for the sake of humankind, for which he received a brutal punishment from Jupiter. Jupiter had him chained to mount Caucasus, where a vulture would prey on his liver daily. Legend has it that his liver renewed as quickly as it was devoured,

which captures the body's remarkable regenerative capacity. Although humans possess natural regenerative capacities albeit at a much lower level, it is still a fascinating phenomenon. But the fact that not every organ in the human body can be regenerated at will is what sets us apart from the Titans in Greek Mythology. But recent advances in the field of regenerative medicine with stem cells has challenged the concept of organ-specific regeneration. This has been realized by discoveries wherein multipotent/pluripotent cells hereby referred to as stem cells have been isolated from many tissues of the body, even from some, such as the nervous system, that have historically been considered incapable of regeneration. While the astonishing pluripotent characteristics of embryonic stem cells has generated much interest in the scientific community, the field has received considerable backlash due to various ethical concerns. This is exactly when researchers intensified their efforts in identifying similar cell lineages in the adult that may contribute to self-renewal. Various reports generated on the versatility, plasticity and the self-renewing capacity of adult stem cells have made them a subject of immense interest in the scientific and general community alike. Harnessing the power of adult stem cells for the repair and general replacement of damaged tissue is fast becoming a reality. The use of stem cells to repair damage to eyes (Macular degeneration) or to replace skin that has been subject to severe burns is already underway. The use of stem cells to restore bone marrow in cancer patients undergoing chemo and radiotherapies is also widespread in use. The extensive usage of stem cells in regenerative/reparative treatments is an ever evolving phenomenon and everyone should realize and appreciate the power of stem cells. All the stakeholders here at Transcell strongly believe in the power of these super cells and constantly strive towards educating the general public about the same.

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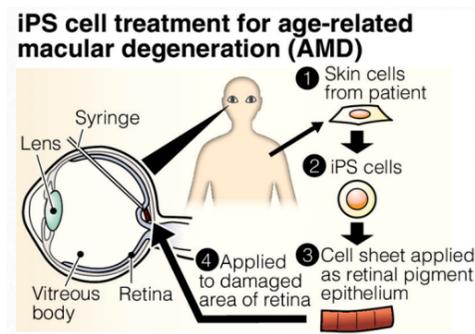


In another recent study patients with chronic stroke underwent surgical transplantation of modified bone marrow – derived mesenchymal stem (BMMSC), a significant improvement was documented in all the patients; all the patients showed an improvement at the standard Stroke Scale, a substantial increase from the baseline with reduction in disease severity, thus confirming the regenerative capabilities of the transplanted cells.

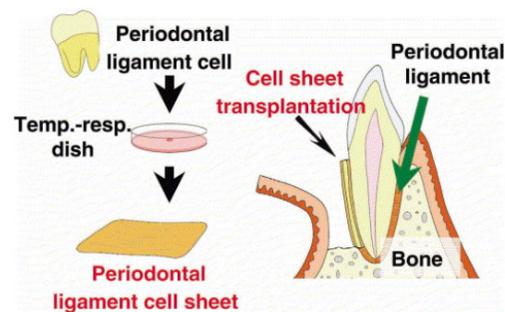


A 20 year old patient suffering from Becker's Muscular Dystrophy who had intense muscle weakness and had difficulty in performing his activities was treated with autologous BMMNC transplantation. The BMMNCs were transplanted via intrathecal and intramuscular routes. Over 9 months post transplantation improvement in muscle strength, respiratory functions was observed. Suggesting that stem cell therapy combined with rehabilitation has the possibility regenerating muscle fibers and decreasing the rate of progression of BMD.

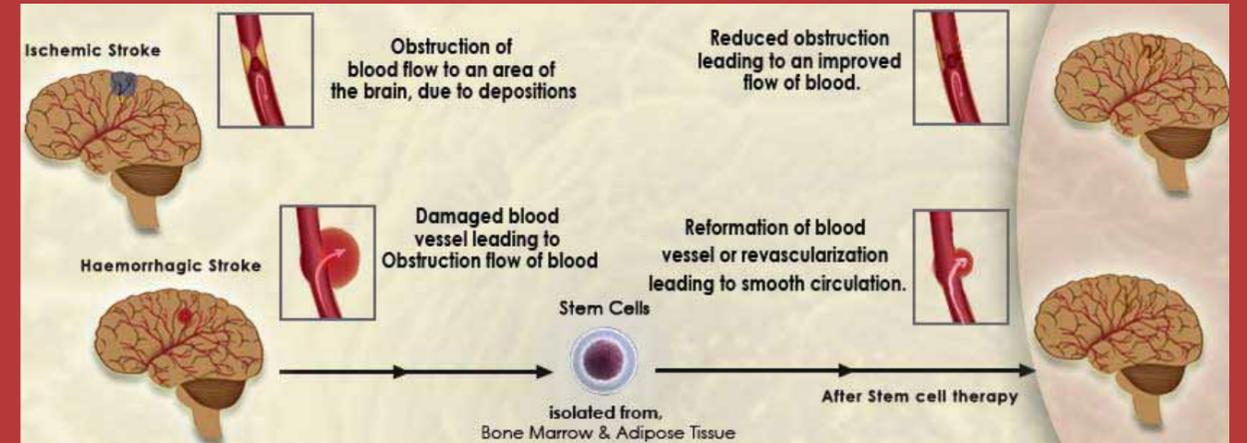
Another group was able to successfully transplant iPSC induced pluripotent stem cells. These cells were derived from skin fibroblast which were transformed into a sheet of retinal pigment epithelial (RPE) cells. This sheet was transplanted into a patient with neovascular age-related macular degeneration. The transplantation has ensured no further degeneration and retained visibility of the patient.



Periodontitis a condition by which tooth-supporting structures are progressively destroyed and this disease is leading reason behind tooth loss in adults. Autologous periodontal ligament stem cells (PDLSCs) along with grafting materials was used for guided tissue regeneration (GTR) to treat periodontal intrabony. The study showed an increase in the alveolar bone height and decrease in the bone-defect depth.



Mesenchymal stem cells were used as a therapeutic option for knee osteoarthritis. BM-MSCs: Bone marrow derived mesenchymal stem cells in combination with hyaluronic acid was used for the treatment. Post transplantation here there was an evident improvement observed. The patients had improved motion range; the damage in the joint had decreased.



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