Cell therapy that increases ten times the graft performance

I+D RESULT

Patent

Knowledge area

- Stem cells
- Regenerative medicine
- Cell therapy

Collaboration

- Technology available to licensing
- Other collaborations may be considered

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System for target of cells to internal regions of a animal or human body

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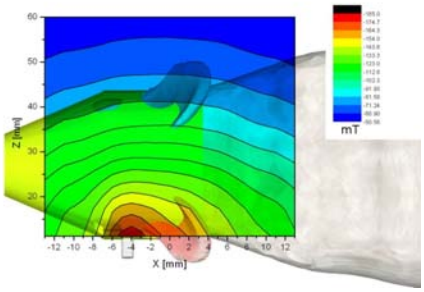
Background:
There are several studies related to mobilization of labeled cells SPIOs (superparamagnetic iron oxide nanoparticles) by applying a magnetic field. In all of them, a stationary magnet is only used, generally with a magnitude of high field. In addition, a delicate surgery is necessary and also, in most cases, intra arterial route is needed, which has a high risk to produce thromboembolism and brain microinfarcts. In the references, systems to mobilize endothelial progenitor cells (EPCs) labeled SPIOs to cortical regions of one of the hemispheres in a model of stroke are described. In them the cells are administered intravenously and mobilized by the attraction carried out by a high magnetic field. A high magnetic field causes the cells to be attracted abruptly and unspecific, without getting achieve focus of injury, since only access to upper layers of the cortical regions. However, the focus of ischemic injury is in deeper areas surrounding the middle cerebral artery. It would be necessary to provide more effective methods for target of cells and using less magnetic fields.

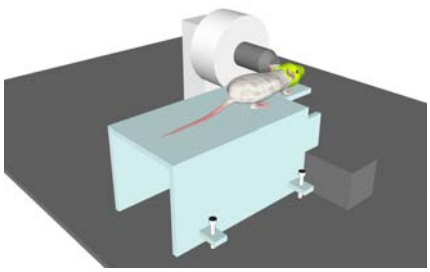
The invention: Researchers from UV, VHIR and IISLaFE have developed a novel system for target stem cells to internal regions of a target human or animal body, adapted to attract magnetically labeled cells with superparamagnetic nanoparticles and injected intravenously. The device consists of an electromagnet, which modulates the magnetic force of extraction of the cells in the bloodstream and thus the target, and a permanent magnet which improves accuracy in targeting. The invention allows to increase up to ten times the graft performance, achieving damaged regions with high accuracy, allowing potentiate the therapeutic effect of stem cells MSCs

Applications: In the field of cell therapy, focusing on systems for precision of the targeting of the graft of mesenchymal stem cells (MSCs) in the repair after injury, of multiple organ and systems, including the central nervous system (CNS).

Advantages: The main advantages provided by the invention are:

- Accuracy in three dimensions in the direction of labeled cells to the target regions.
- Easier and flexibility of position of the magnet or magnets with respect to the target area, in fixed or adjustable positions. It does not require glue or adhesive on the skull of the animal, due to the use of a support.
- It allows the use of different mediums types (helmets, belts, belts, corsets, etc.) for different animals and humans.
- Less applied magnetic power, of the order of 150 mT at zero distance.
- Reduced exposure time, of about 1 to 60 minutes.





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