SCLEROCORNEAL LIMBUS ALLOGRAFT FOR THE TREATMENT OF OCULAR SURFACE PATHOLOGIES

For the first time, it has developed a method that makes it possible to obtain the human sclerocorneal limbus fully decellularized from a cadaveric donor, so that it is functionalized to treat patients with immunogenic, inflammatory, or deficiency diseases on the ocular surface.

Technology for Licensing

Keywords:

Sclerocorneal limbus, allogeneic transplant, allograft, scaffold, cell transplant, mesenchymal stem cell, delivery system.

Description:

Fighting limbal insufficiencies, the preferred methods are, firstly, autotransplantation, and, secondly, living donor allogeneic transplantation. However, both carry significant risks. In autologous transplants, the patient is seldom willing to assume the risks inherent in healthy eye surgery. In living donor allogeneic transplants, it is difficult to find a highly compatible donor with the patient who also accepts the surgery risks.

Up to now, the option with the highest failure rate is cadaveric donor allogeneic transplant. This is due to problems associated with tissue freshness, histocompatibility, and infection risks, among others.

For solving the aforementioned problems, it has been developed a new method that allows allogeneic transplantation of the corneal limbus of a cadaveric donor and provides other benefits. This method consists of decellularizing the donor limbus to avoid immune rejections and thus obtaining a base structure (scaffold). This is subsequently recellularized with cells that may be different, such as limbal cells or mesenchymal stem cells. These cells have low immunogenicity and regenerating and repairing effect, to finally implant it in the affected patient.

Additionally, the generated scaffold could potentially use as a release system for cellular factors and/or drugs.

Advantages and Benefits

- High availability of the scaffold
- Low risk of immune rejection

  Immunosuppressive treatment is not needed, which avoids its associated adverse effects.
- Scaffold identical to the original
  - Save expenses derived from tissue engineering technology.
  - Obtain a biomaterial that supports cell growth and differentiation.
- Recellularized scaffold with stem cells or other cell types that provide therapeutic effects:
  - Hosted stem cell high plasticity allows their differentiation into other cell types and re-establish the damaged tissue normal cellularity.
  - The scaffold can function as a release system for cellular factors and/or drugs.
- Allotransplantation with wide applicability:

  Unilateral or bilateral, partial or total limbal insufficiency.
  Corneal epitheliopathies.
  Corneal neovascularization.
  Corneal neurotrophic ulcers.
  Ocular autoimmune processes.

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