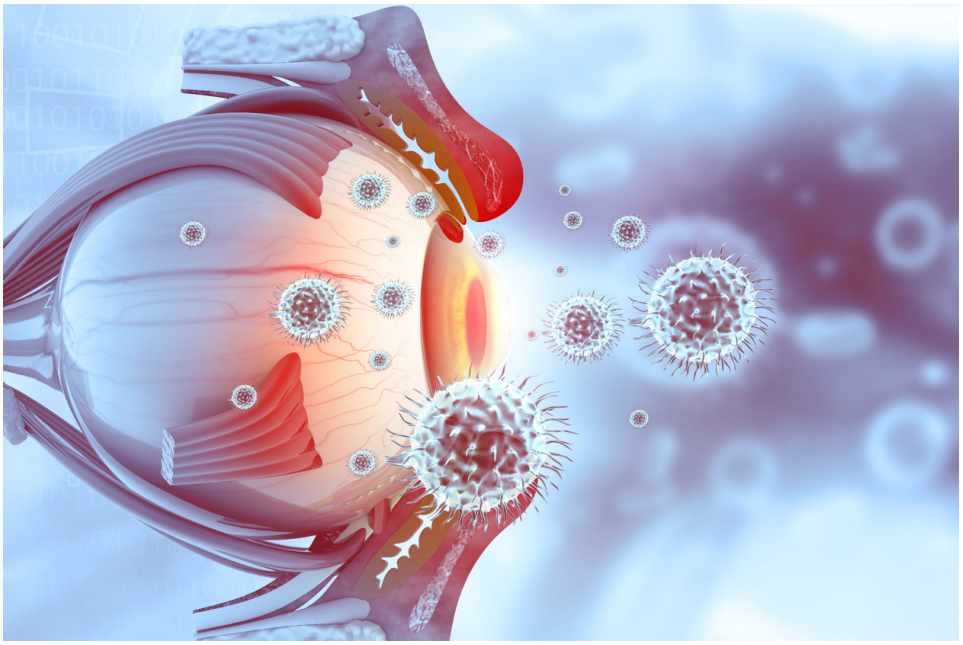
A Mechanism of Promoting Corneal Endothelial Cell Wound Healing

A method of culture of corneal endothelial cells that can provide cornea endothelial repair to circumvent the need for corneal transplant



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Category
Regenerative Medicine

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Background

Cornea damage either through physical trauma or disease (e.g. Fuchs' endothelial dystrophy (FED)) has a significant impact on the quality of life of the individual and, if left untreated, could result in loss of vision. FED itself accounts for a large proportion of patients undergoing a corneal transplant. However, the shortage of donor corneas remains a significant problem in the treatment of cornea disease. Corneal blindness is the third leading cause of blindness worldwide.

Potential ocular infectivity of SARS-CoV-2 transmission through the ocular surface remains a concern based on molecular and animal studies. The current UK guidelines issued by the National Health Service Blood and Transplant exclude any donor with confirmed COVID-19 infection further compromising the availability of donor tissue.

Technology Overview

Cornea transplant is the primary treatment for patients with corneal endothelial cell (CEC) loss or dysfunction due to corneal endothelial disease. In the past Fuchs' endothelial disease was treated with penetrating keroplasty; a transplantation procedure that replaces the diseased cornea with a full-thickness donor corneal graft. University College London's technology is at the applied research stage and seeks partners/licensees to progress the application.

ENA-78 is a chemokine secreted by one cell type to modulate the behaviour of another cell type. The presence of ENA-78 is found in many types of cancer cells. It is also found in the human cornea, secreted by corneal stromal cells. The role of ENA-78 is well known to be a promoting factor of cancer cell proliferation and migration. Their studies describe the function that ENA?78 imparts on CECs. This is the first study that describes the function of ENA-78 in promoting CEC proliferation and migration.

Benefits

Potential to promote CEC repair via either an eye?drop formulation or other delivery system avoiding the need for corneal transplantation.

Applications

As the CECs do not have regenerative potential in vivo, they must be maintained throughout life. Damage or dysfunction of these cells could lead to partial or total blindness. Various pathologies cause CEC dysfunction, including viral infection, intraocular surgery and Fuchs' endothelial dystrophy (FED). FED, the most common etiology of corneal endothelial dysfunction, is a primary indication for corneal transplantation. This disorder affects up to 4% of those over 40 years old in the USA, and up to 35% of all corneal transplants performed in the United Kingdom are due to FED.

Opportunity

University College London is seeking partners to progress this technology with an option to licence, or a licensee who has the ability to develop this technology in?house.

Patents

• GB 2208950

Seeking

Licensing, Development partner