

Technology Offer

Complement Anaphylatoxin Binding Peptide for treating Ocular Fibrosis

Ref. No.: CH895/2018

Background

Degenerative eye disorders, which are associated to a severe loss of visual acuity very often are the result of misguided angiogenesis or wound healing/fibrogenesis. While vascular eye disorders can be treated with anti-VEGF agents, there are still no therapeutic approaches for the treatment of fibrotic eye disorders. Misguided fibrosis is of high relevance in particular on the cornea. Corneal fibrosis leads to loss of optical transparency, loss of vision and blindness. Corneal scars and fibrosis can occur on base of a bacterial-, mycotic, herpetic or adenovirus infections, corneal burn, contact lens-associated keratitis or after trauma. The life-time risk to suffer a relevant ocular trauma, with corneal affection accounts for 20%. In most cases, a corneal transplantation is the only option to restore vision. Current therapeutic options to inhibit ocular fibrosis are limited to Corticosteroids and Ciclosporin A. Both possess non-specific efficacy, accompanied with severe adverse side effects and are not applicable in the early phase of disease.

Technology

A novel approach for treating ocular fibrosis has been developed which is based on using the N-terminal peptide fragment of the known complement anaphylatoxin C5a receptor C5L2/C5aR2, a G-protein coupled transmembrane protein. *In vitro* investigations with human corneal keratocytes have shown that stimulations with complement anaphylatoxins C5a and C3a lead to significant myofibroblast activation. In the presence of the C5L2-peptide fragment, the C5a- and/or C3a-mediated myofibroblast activation was significantly decreased. The peptide is able to bind C5a and C3a and thereby prevents C3a and C5a interaction with the natural complements receptors (C5aR1, C5aR2/C5L2 and C3aR) expressed on the corneal fibroblast. Also *in vivo* experiments with a corneal alkali-burn mouse model revealed the anti-fibrotic effect of the C5L2-derived peptide fragments: Mice treated with the C5L2 peptide fragment demonstrated a significantly reduced area of fibrosis and a reduced density of opacity on the cornea, 20 days after corneal alkali-burned.

Benefits

- ✓ First in class anti-fibrotic agent - Binding of three targets: C3a, C5a and C4a
- ✓ Early administration during disease course possible
- ✓ Pathogen clearance remains intact
- ✓ Small peptide size allows tissue penetration, that enables transfer to anterior ocular chamber, and the application as eye drops

Application

Treatment of ocular fibrosis, corneal fibrosis, other/general fibrotic diseases

Commercial Opportunity

Searching for a licensing or developing partner

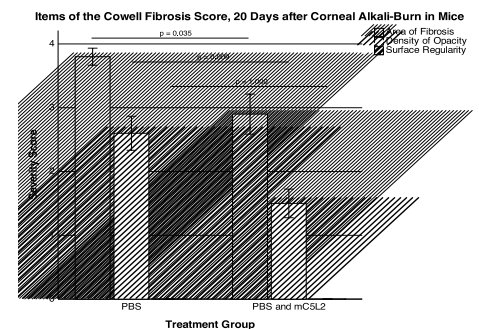


Fig. 1: Mouse C5L2 peptide fragment is able to significantly reduce the area of fibrosis and the density of opacity in corneas in the corneal alkali-burn mouse model (N=10 mice per group).

Key words

Corneal fibrosis, complement factor, anaphylatoxins, C5a, C4a, C3a, C5L2, C5L2-peptide, fibrosis, eye disease, ocular fibrosis

Developmental Status

in vivo (mouse model)

IP Status

EP patent application (06/2018)
Pending patent applications: US, EP, JP
[WO 2019/243555](https://patents.google.com/patent/WO2019243555)

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