UNIVERSITY OF LIVERPOOL

Enterprise: Licensing & Ventures

Reshaping the Future of Vision: Chemical Cross-Linking in Keratoconus Care

Keratoconus– Unmet need

Keratoconus is a progressive eye disorder affecting 1 in 2,000 people in the UK, with rates up to 10 times higher in some South Asian populations. It leads to a 40% reduction in corneal stiffness and significant vision loss, often during individuals prime working years. The condition accounts for approximately 25% of all corneal transplants.

Current standard treatment riboflavin/UVA cross-linking requires removal of the epithelium, causing pain, risk of infection, and cytotoxicity. It is unsuitable for patients with thin corneas, and long-term .

Key Benefits

- **Trans-epithelial delivery:** no need to remove the protective outer layer of the eye
- **No UVA exposure:** reduces risk of cytotoxicity and long-term side effects
- **Rapid, pain-free treatment:** applied as an eye drop in a single outpatient visit
- **Suitable for thin corneas:** expands eligibility for patients currently excluded

With its patient-friendly design and scalable formulation, the CXL represents a transformative step forward in the treatment of keratoconus and potentially other corneal disorders.

UoL Solution – A New Chemical cross-linker (CXL)

The CXL offers a novel, non-invasive chemical cross-linking treatment for keratoconus that overcomes the major limitations of current therapies. Delivered as a simple 15-minute eye drop, the CXL strengthens the cornea without the need for UV light or epithelium removal making treatment safer, faster, and more comfortable for patients.

Intellectual property

The method and its application in the treatment of eye disorders is protected under patent application WO2023194587A1.
It is currently in the National Phase in the United States, Europe, and India.

Team

The project is lead by Professor Rachel Williams leads a highly experienced interdisciplinary team at the University of Liverpool, bringing together expertise in ophthalmic bioengineering, biomaterials, and clinical ophthalmology. With an established track record in developing innovative eye treatments and strong collaborations across academia, healthcare, and industry, Professor Williams's team is internationally recognised for translating laboratory research into real-world clinical impact.

Next Steps

- In vitro and in vivo proof-of-concept data available
- Recently awarded a £2.4 million MRC DPFS grant to support (via a CRO) formulation, PK/PD and pre-clinical safety studies (18-month timeline).
- Seeking collaboration and licensing opportunities

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