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Headline: Dublin team creates collagen and stem cell barrier against blindness

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Medical research

SOMETIMES research and innovation can transform lives. Work by Prof Fergal O'Brien has the potential to do just that, helping to protect clear vision in patients with a particular eye disorder.

Based at the Royal College of Surgeons in Ireland, O'Brien heads the tissue engineering research group in the department of anatomy. "The focus of the work we do is the use of collagen-based biomaterials for tissue repair in combination with stem-cell therapies," he explains. Collagen is the main component of connective tissue and is the body's most abundant protein. O'Brien is using it as a base material in cartilage repair and also in bone regeneration and in cardiovascular applications.

Because of this expertise, he was approached to develop a way to repair the cornea, the clear "window" of the eye. The cornea is protected by an essential outer layer of tissue called epithelial cells, and in some conditions this breaks down, something that over time can cause blindness.

The eye produces limbal stem cells to repair damage to the epithelial layer, but if there are not enough – as in limbal stem-cell deficiency disorders – vision may degrade before repairs can occur.

O'Brien's team has developed a thin, transparent collagen scaffold and he plans to seed this with limbal stem cells and then use it as a protective cover for the cornea. "It will cover the surface of the eye and help regenerate the corneal surface," he says.

Enterprise Ireland funds some of his research, which is near to market, and last month, he received a Technology Innovation Development Award from Science Foundation Ireland.

"I want to see these treatments coming into use and improving people's quality of life," he says.

DICK AHLSTROM, Science Editor