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ASIA EDITION

Singapore develops thermogel to prevent retinal scarring

July 5, 2022 | News

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Scientists from A*STAR's Institute of Molecular and Cell Biology (IMCB) and Institute of Materials Research and Engineering (IMRE), the National University of Singapore (NUS) and the Singapore Eye Research Institute (SERI) have developed a bio-functional thermogel, a type of synthetic polymer, to prevent retinal scarring caused by failed retinal detachment repair surgery.

Proliferative vitreoretinopathy (PVR) occurs when the retinal scarring prevents the retina from healing and falling back into place, and accounts for more than 75 per cent of failed retinal detachment surgeries, and may result in vision loss or blindness if left unrepaired.

Current treatment options for PVR are limited to surgical removal of these scar membranes with guarded visual recovery.

This work highlights the potential of using synthetic polymers alone to modulate cellular behaviour and for the first time, offers a novel thermogel-based therapy to prevent retinal scarring.

The thermogel is currently being commercialised by Vitreogel Innovations Inc, an A*STAR spin-off that focuses on developing polymer-based therapeutics for ophthalmology indications.

Building on this work, the team will continue to test the safety and efficacy of this polymer for retinal detachment repair and PVR prevention using additional pre-clinical disease models. Through their work, the team aims to engineer the next generation of polymers with targeted chemical modifications to elicit specific cellular behaviours, and identify alternative applications of the thermogel beyond ophthalmology.