

Hong Kong researchers suggest novel treatment approaches for glaucoma

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According to statistics from the Hospital Authority, in Hong Kong, three out of every 100 individuals aged over 40 suffer from glaucoma

Dr Samantha SHAN, Research Assistant Professor of the School of Optometry of The Hong Kong Polytechnic University (PolyU) and her team have discovered the mechanism of intraocular pressure (IOP) regulation, paving the way for novel treatment approaches for glaucoma, with the aspiration of preventing vision loss from this disease.

In glaucoma patients, the fluid within the eye (known as aqueous humour) continuously flows, resulting in higher IOP for which long-term medication is required. However, current drugs have limitations in that they can only slow disease progression rather than halt it completely. Drugs may also have suboptimal tolerability and their efficacy diminish over time.

The microRNA(miR)-17-92 cluster is known to play an important role in cell signalling, but its specific functions in the eye are not well understood. In this respect, Dr Shan and her team's research focus lies in gaining insights into the mechanisms of miR-17-92 cluster members and their effects on IOP.

The team has identified thrombospondin-1 (TSP-1) as a protein that reduces the outflow of aqueous humour and increases IOP. Concurrently, the team mimicked three members of the miR-17-92 cluster in human trabecular meshwork (hTM) cells which are responsible for draining aqueous humour within the eye. It showed that the expression of TSP-1 was repressed, resulting in an approximately 73% increase in the outflow of aqueous humour in mice.

Dr Shan remarked, "Genomic and proteomic approaches play a crucial role in understanding the genetic and molecular mechanisms underlying diseases such as glaucoma. In the context of glaucoma treatment, these approaches can help identify potential biomarkers, therapeutic targets and personalised treatment options, with far-reaching implications."