Research focuses on common cause of blindness

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Royce Mohan, the Solomon Chair in Vision Biology and Eye Diseases.

(Medical Xpress) -- Vision scientist Royce Mohan is focusing in on a treatment for corneal fibrosis, an irreversible pathogenic mechanism associated with the second-leading cause of blindness in the world. The cornea is the clear tissue in front of the eye. It acts like a lens to focus light and also protects the eye. When the eye is afflicted by injury, infections or disease, one of the most common features is that the cornea becomes cloudy.

Mohan, the John A. and Florence Mattern Solomon Chair in Vision Biology and Eye Diseases at the UConn Health Center, says "Corneal fibrosis is like deep frost that cannot be removed from your windshield when you're driving. It can be frightening and you suddenly realize the importance of seeing clearly."

Mohan's research that involved an interdisciplinary team, published online in The Journal of Biological Chemistry, could lead to a drug discovery that clears away the cloudiness and returns normal vision.

The drug Mohan is studying is Withaferin A (WFA), a naturally occurring chemical compound found in the winter cherry plant and used in ayurvedic medicine to treat women's bleeding disorders.

Co-author of the study, Paola Bargagna-Mohan, found that WFA protects against corneal fibrosis by downregulating or suppressing a protein called vimentin that typically spurs fibrotic growth. When vimentin is genetically removed from an animal model, the cornea heals better from injuries that lead to fibrosis.

"We are fascinated that we can actually do the same with a drug," explains Mohan. "We can cause this vimentin protein to be downregulated and evoke much of the protection that the genetic paradigm has shown us."

Fibrosis is not just a problem for the eyes but for all organs including the heart and lungs. When fibrosis cannot be stopped in a vital organ, it can be lethal. As much as 45 percent of all human mortality is due to fibrosis.

"So this research has much larger implications," says Mohan. "We're using the eye to not only study blindness but to also ask a fundamental question, 'What do these proteins - which are induced during fibrosis - do and how can we stop their pathogenic roles?'"

More information: You can view the entire article at today.uchc.edu/pdfs/mohan_eyedisease.pdf