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Blinded by sFRP-1: A WNT signaling protein plays a key role in glaucoma

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Glaucoma is one of the major causes of visual impairment and blindness throughout the world. A major risk factor for the disease is an increase in the pressure in the eye (intraocular pressure [IOP]). IOP is determined by the rate of production of the clear fluid in the eye and the rate at which this fluid flows out of the eye.

Although it is thought that impaired outflow of fluid from the eye causes the increased IOP in individuals with glaucoma, the precise molecular mechanisms underlying the disorder are poorly understood.

In a new study, Abbot Clark and his colleagues, at Alcon Research Ltd. in Fort Worth and the University of Iowa in Iowa City, have revealed that increased expression of the protein sFRP-1, an inhibitor of cell signaling through WNT proteins, seems to be responsible for elevated IOP in individuals with glaucoma.

The researchers found increased expression of sFRP-1 in eye tissue from patients with glaucoma. When donor human eyes were treated with sFRP-1 ex vivo, these eye tissues exhibited decreased outflow of fluids compared to untreated eyes.

Furthermore, the sFRP-1 treated donor eyes also had reduced expression of a WNT-related protein. Finally, increased IOP was observed in mice manipulated to express sFRP-1 in the eye and this was effectively resolved by treatment with an inhibitor of a downstream suppressor of WNT signaling. The authors therefore concluded that restoring WNT

signaling might be a novel way to treat individuals with glaucoma.

Source: Journal of Clinical Investigation

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