Impaired autophagy associated with age-related macular degeneration

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A new study published in the prestigious *PLoS One* journal changes our understanding of the pathogenesis of age-related macular degeneration (AMD). The researchers found that degenerative changes and loss of vision are caused by impaired function of the lysosomal clean-up mechanism, or autophagy, in the fundus of the eye. The results open new avenues for the treatment of the dry form of AMD, which currently lacks an efficient treatment. The University of Eastern Finland played a leading role in the study, which also involved research groups from Italy, Germany and Hungary.

AMD is the most common cause of visual impairment in the Western world, and the number of AMD patients is expected to soar in the upcoming decades. AMD is divided into the dry and wet form of the disease, and 85% of AMD patients suffer from dry AMD. Unfortunately, an efficient treatment involving injections into the eye only exists for the wet form of the disease.

AMD is a storage disease in which harmful protein accumulations develop behind the retina. These accumulations are indicative of the severity of the disease. As the disease progresses, retinal sensory cells in the central vision area are damaged, leading to loss of central vision. The cell biological mechanisms underlying protein accumulations remain largely unknown.

For the first time ever, the present study showed that AMD is associated with impaired lysosomal autophagy, which is an important clean-up

mechanism of the fundus of the eye. This renders the cells in the fundus of the eye unable to dispose of old, deformed or otherwise faulty proteins, which, in turn, leads to the development of protein accumulations and loss of vision. The study can be regarded as a breakthrough, as the results change our understanding of the pathogenesis of AMD and also open new avenues for the treatment of the dry form of AMD. Drugs inhibiting the impairment of autophagy could possibly even stop the progression of AMD.

More information: Viiri, J. et al. Autophagy Activation Clears ELAVL1/HuR-Mediated Accumulation of SQSTM1/p62 during Proteasomal Inhibition in Human Retinal Pigment Epithelial Cells, *PLoS One*, 2013 Jul 29;8(7):e69563. DOI: 10.1371/journal.pone.0069563.