

MU researchers find clue to cataract formation

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It is the No. 1 line-item cost of Medicare reimbursement and affects more than 20 million people in the United States. Cataracts, which can have devastating effects on the eye, affect 42 percent of the population between the ages of 70 and 80, and 68 percent of the population over the age of 80, according to the National Eye Institute. Now, a University of Missouri professor has identified an important step in how cataracts form. This discovery, published in a recent edition of *The Journal of Biological Chemistry*, could lead to a better treatment or cure for cataracts in the future.

In his study, K. Krishna Sharma, professor of ophthalmology at MU, found that a specific type of protein begins to lose function as the eye ages. As the protein loses function, small peptides, made of 10 to 15 amino acids, start forming and accelerate cataract formation in the eye.

“It is very helpful to track the formation of these peptides,” Sharma said. “The next step is to work on preventing their formation. If we are successful, we could delay the aging process in the eye. A ten-year delay in the onset of cataracts could decrease the number of cataract surgeries by 45 percent, thus significantly decreasing vision care cost. Currently, 1.5 million to 2 million cataract surgeries are completed yearly.”

About 50 percent of the lens is made of proteins, and 90 percent of the proteins are structures known as crystallins. One of the main functions of the crystallins is to maintain the clarity of the lens through an activity known as “chaperoning”. In a healthy eye, crystallins break down over

time, eventually degrading to small peptides. The peptides are then cleared from the eye with the help of other proteins.

As the eye ages, small peptides start to form at an increasing rate. As the number of small peptides increases in the eye, chaperone activity starts to decrease, resulting in less cleansing activity inside the lens. As the small peptides increase, the eye's lens starts to develop cataracts. There are a variety of causes that lead to the decrease of chaperone activity, and the presence of these small peptides accelerates the process, Sharma said.

“It’s a very sad situation, because cataracts can have a huge impact on the quality of a person’s life,” Sharma said. “People lose the ability to appreciate visual art and have to learn a new set of skills to navigate. This study will bring us another step closer to understanding how cataracts form in the eye and how best to treat this debilitating disease.”

Source: University of Missouri-Columbia

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