Seeing Clearly

Follow this and additional works at: https://ecommons.udayton.edu/news_rls

Recommended Citation
https://ecommons.udayton.edu/news_rls/625

This News Article is brought to you for free and open access by the Marketing and Communications at eCommons. It has been accepted for inclusion in News Releases by an authorized administrator of eCommons. For more information, please contact frice1@udayton.edu, msclangen1@udayton.edu.
University of Dayton, Ohio (url: http://www.udayton.edu/index.php)

Seeing Clearly

07.13.2012 | Health, Research, Science

A University of Dayton lab has identified a "roadmap" for safely preventing secondary cataracts by stopping them before they start.

Secondary cataracts are common complications of cataract surgery, occurring in up to 40 percent of patients, according to the National Eye Institute. When a cataract is removed, remaining lens cells can migrate towards the vision field of the artificial lens. The regeneration activity of these cells can cloud the new lens, requiring laser surgery to remove them.

In a recent study, researchers at the University of Dayton proposed to reduce the incidence of secondary cataracts with targeted micro RNA (miRNA) therapy. miRNA are short RNA strands that represent a unique group of genetic switches for regulation of cell development and regeneration. The results of the study, published in Molecular Medicine in May, provide a roadmap for potential therapies that control miRNA expression for the prevention of secondary cataracts.

The trick is to find the right miRNA to control.

"You have to know the right miRNA players to use in a therapy," said Andrea Hoffmann, Ph.D., a senior postdoctoral researcher. "If we do, the benefit of miRNA therapy is that miRNAs are relatively short-lived within the human body, so it is less controversial than viral gene therapy."

Until now, very little was known about miRNA activity in the lens-healing process. The researchers tested 627 of the most common miRNA strands in mice that are similar to those in humans. Finding the "right miRNA players" requires narrowing down the list. That's just what Hoffmann and her colleagues did.

Following cataract surgery in mice, the researchers found 55 miRNA strands that changed during the three-week healing process. The team selected two specific miRNA strands to test and found clear evidence that controlling them reduced the appearance of secondary cataract characteristics in cell culture.

"There are other miRNA candidates worth investigating as well," Hoffmann said. "But what this research offers is a roadmap for future research."

The research was conducted in the University of Dayton's Center for Tissue Regeneration and Engineering at Dayton (TREND), with Panagiotis Tsonis, Ph.D., biology professor and TREND Center director as the principal investigator of the study. The TREND Center is an Ohio Center of Excellence in the field of biomedicine and health care and includes a research alliance with Wright State University, the Kettering Medical Center Network, Rice University and others. Established in 2006, it has more than 20 researchers participating from six academic departments and the University of Dayton Research Institute. Center investigators maintain nearly $5 million in research contracts and grants, and have compiled more than 500 peer-reviewed articles.

The article is published in the May issue of Molecular Medicine as "Implication of the miR-184 and miR-204 Competitive RNA Network in Control of Mouse Secondary Cataract." Authors included Hoffmann; Tsonis; Yusen Huang, formerly with the University of Dayton and currently at the Shandong Academy of Medical Sciences in Qingdao, China; Rinako Suetsugu-Maki, TREND Center; Carol S. Ringelberg and Craig R. Tomlinson of Dartmouth College; and Katia Del Rio-Tsonis, Miami University.

For more information, contact Cameron Fullam, assistant director of media relations, at 937-229-3256 or fullam@udayton.edu.