Macular Degeneration Research
News
BETTER HEALTH THROUGH RESEARCH SPRING 2009

Scientists Find First-Ever Genetic Link to Dry AMD

MDR-supported research also finds downsides in wet AMD therapy

In a groundbreaking development, researchers funded by Macular Degeneration Research have found the first gene associated with severe dry AMD. They have also shown that people with a particular variant of this gene could suffer adverse consequences if they are treated with an experimental therapy currently being tested for wet AMD.

In a paper published by the New England Journal of Medicine, a team of scientists with the University of California, San Diego, School of Medicine, reported a link between dry AMD and toll-like receptor (TLR3), a molecule that alerts the immune system to the presence of viral infections.

In addition, scientists found that a genetic variant associated with low activity of the TLR3 receptor protects against dry AMD, perhaps by safeguarding key retinal cells.

However, people with this variant could be at risk if they are undergoing a new wet AMD treatment called RNA interference (RNAi), which, by activating TLR3, suppresses its protective function. Researchers found that TLR3 activation in these cases caused 60 percent more retinal cell death.

"Ironically, in some individuals, using RNAi to cure wet AMD might actually increase the risk for blindness from dry AMD," says study leader Kang Zhang, M.D., Ph.D.

Adds Jayakrishna Ambati, M.D., of the University of Kentucky: "These findings pave the way for using TLR3 inhibitors as a potential new therapy for dry AMD, and simultaneously highlight the importance of critically assessing the potential risk posed to patients by RNAi-based therapies."

Macular Degeneration Research graciously contributed towards this study. MDR President Brian Regan hailed Dr. Zhang and his team for advancing scientific understanding of dry AMD, which causes 10 percent of the legal blindness in the United States. "The work of these researchers is a critically important step toward devising effective treatments for this terrible disease," said Regan.

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A variety of resources are available for people who suffer from macular degeneration. For a list of agencies that offer counseling, training and other special services please call Macular Degeneration Research at **1-800-437-2423** or visit our website at **www.ahaf.org/macular.**

President's Corner

What YOU can do

Because there is still so much we don't yet know about advanced macular degeneration, it can be easy to surrender to despair—to believe that nothing we can do makes a difference.

But in fact, research increasingly shows we can take concrete action to protect our vision health. In particular, a study reported in this issue of Macular Degeneration Research News suggests the importance of two key steps.

First, avoid direct sunlight. Exposure to the sun can seriously harm the cells of the retina and hasten the onset of AMD. When you go outside, lower your risk by wearing sunglasses and a broad-brimmed hat.

Second, eat well. A diet rich in antioxidants—including vitamins C and E, carotenoids and zinc—can significantly reduce the damage done by lifetime sunlight exposure.

And don't forget the importance of educating yourself. The more you learn about AMD, the better you can equip yourself against it. And you can count on Macular Degeneration Research to be your continuing partner in that effort.

Brian K. Regan, Ph.D.
President

Researchers Make Damaged Retinal Cells Grow Again

Animal studies offer hope for restoring vision loss in AMD patients

For the first time, scientists have been able to regenerate new inner nerve cells in mammals' damaged retinas, raising the possibility of one day reversing the damage caused by AMD in human subjects.

While previous studies have shown that retinal nerve cells can be regenerated in a laboratory dish, researchers with the University of Washington have now performed the same feat in living mice, targeting a specific retinal cell type called the Müller glia.

"This type of cell exists in all the retinas of all vertebrates," says Dr. Tom Reh, professor of biological structure, "so the cellular source for regeneration is present in the human retina."

In humans, Müller glia cells generally stop dividing early in the body's development, and although the cells have the potential to regrow spontaneously in response to an injury, they generally do not. The University of Washington team found that, by injecting the eyes of mice with growth factors and, in some cases, insulin, they could trigger the spread of Müller glia cells across the retina.

Scientists say that additional studies of this phenomenon could open the door to new treatments of AMD and other retinal diseases.

Research Roundup

MDR-funded research targets role of immune system in AMD

A variant of a gene carried by one-quarter of the population could play a critical role in both triggering and preventing AMD, according to a study funded by Macular Degeneration Research.

Scientists with Great Britain's University of Southampton looked at the retina and the adjoining choroid layer, the two areas affected by AMD, and found evidence of proteins expressed by the gene SERPING1. These same proteins help regulate a key component of the body's immune system called the "complement system," suggesting that the breakdown of this system could trigger attacks on the retina and choroid layer.

"It seems counterintuitive that a generalized innate immunity defense system should result in a localized disease of the eye in the elderly," says Professor Andrew Lotery. "However, it is becoming increasingly clear from research that this is the case."

Sunlight, low antioxidant levels could put seniors at risk

Exposure to sunlight may damage the retina and contribute to the development of AMD, according to a European study, but a diet rich in antioxidants may mitigate those effects.

While ultraviolet radiation is mostly absorbed by the cornea and lens, visible light, particularly blue light, can penetrate all the way to the retina. In particular, the study found that blue light exposure, coupled with low levels of antioxidants, makes it four times likelier for a person to develop AMD.

The study's authors recommend a diet high in vitamin C and zinc and carotenoid-rich fruits and vegetables. Researchers also recommend limiting sunlight exposure by wearing broad-brimmed hats and sunglasses outdoors.

Electronic magnifying glass opens up world of light

Over the past decade, more and more people with AMD have begun to benefit from portable, print-magnifying video devices. Weighing up to 9 ounces, these hand-held systems can be aimed at objects both near and far, displaying the text on a screen in clear, large, well-contrasted lettering.

> **"One of the concerns we have with the visually impaired is depression..."**

Dr. Bruce P. Rosenthal, chief of low-vision programs at Lighthouse International, says the portable magnifiers could help people perform such diverse tasks as shopping for groceries or following along in prayer books. "One of the concerns we have with the visually impaired is depression," he told the New York Times. The more that people can carry out everyday tasks, he said, "the more they can cope and feel that their lives are no different than others."

One caveat: The price tag for these portable devices typically runs between $700 and $1,300 (as opposed to $40 for an old-fashioned magnifying glass) and they are generally not covered by Medicare or private insurers. "But if the devices get you back to work, or help you with your education, or increase your pleasure in reading, it's well worth considering them," says Robert McGillivray of the Carroll Center for the Blind.

Log onto our website at **www.ahaf.org** then simply click on the Macular Degeneration Research link to learn more about what's new in the world of research, as well as important information about risk factors for macular degeneration.

Feel Good About Your Gift

Planned giving can help fight AMD

Through thoughtful planned giving, you can help us search for an AMD cure while also passing along the values that have guided your life.

Whether you send a check, donate stock or include Macular Degeneration Research in your will, your gifts will put you front and center in the fight to discover treatments that will benefit millions. You may also be able to reduce your estate taxes and leave a larger inheritance for your loved ones.

For additional information, or if you want to discuss the many giving options available, please contact Barbara Spitzer, Development Coordinator, at 1-800-437-2423 or email her at bspitzer@ahaf.org.

Thank you for thinking of Macular Degeneration Research!

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