

Antibodies to immune cells protect eyes in pseudomonas infection

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Contact lenses, particularly the extended wear variety, render wearers vulnerable to eye infections from *Pseudomonas aeruginosa*. These infections can cause severe damage, including blindness. Treating the eye with antibodies to the inflammatory immune compound interleukin-17 (IL-17) reduced eye damage and the number of bacteria in a mouse model. The research is published in the October *Infection and Immunology*.

The onslaught of *Pseudomonas* infection of the eye is often swift, and is aggravated by the bacterium's resistance to antibiotics. "Pseudomonas is everywhere in the environment, and can be unwittingly introduced into the lens cleaning solution, or directly onto the contact lens, so everyone who uses contact lenses is at risk," says principal investigator Gregory P. Priebe of Brigham and Women's Hospital, Boston, and Boston Children's Hospital.

[Immune cells](#) known as [neutrophils](#) are a major cause of the [eye damage](#) that ensues from *Pseudomonas* infection. IL-17 is involved in attracting neutrophils to the infected tissues. They are the vanguard of immune attack, arriving at a site of infection within an hour, trapping, and ingesting pathogens. In their pathogen-killing function, they also release noxious substances, notably elastase, an enzyme that can chew up tissues, and superoxide, which is converted into hypochlorous acid, more commonly known as chlorine bleach. Thus, the ensuing eye damage is not surprising.

Nonetheless, the strategy of blocking these pathogen killing cells risked reducing the immune system's bacteria-killing function, says Priebe.

"Surprisingly, just the opposite was seen: blocking IL-17 with antibodies led both to fewer neutrophils in the eye, and to fewer bacteria," says Priebe. Thus, he says, the research may lead to effective treatments.

"We thought that blocking IL-17 infection might worsen [eye infections](#), but found just the opposite,' says Priebe . "Interestingly, this is a common pattern in eye infections. The body's responses that make the damage worse are often the same things needed to limit infections in other tissues, such as the lung."

More information: T.S. Zaidi, T. Zaidi, G.B. Pier, and G.P. Priebe, 2012. Topical neutralization of interleukin-17 during experimental *Pseudomonas aeruginosa* corneal infection promotes bacterial clearance and reduces pathology. *Infect. Immun.* 80:3706-3712. bit.ly/asmtip1012c

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