

# Scientists isolate portion of virus that causes pink eye

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Viral keratoconjunctivitis, also known as pink eye, is a common, uncomfortable and highly contagious condition. There is no known effective treatment for this adenovirus infection that can force some individuals into isolation for up to two weeks. The virus is resilient and can remain infectious for up to 30 days on a plastic surface. Infection with the adenovirus causes inflammation, which results in red, irritated eyes, blurry vision and discharge.

But now, relief may be in sight with a new understanding of how the [eye](#) reacts to this [virus](#). Researchers in the Howe Laboratory, Department of Ophthalmology of the Massachusetts Eye and Ear Infirmary and Harvard Medical School, and in the University of Oklahoma Health Sciences Center, used a novel model to determine what part of the virus is responsible for [inflammation](#) in pink eye. Their findings are outlined in the April 15 issue of *PLoS Pathogens*.

"We were interested in understanding what part of the human adenovirus causes inflammation. We found that it is the protein coating around the virus that is most inflammatory in the eye. This is important because without inflammation, there would be no discharge from the eye, and therefore no transmission. Now that we know what causes the inflammation, we hope to find a way to block it," said James Chodosh, M.D., M.P.H., Mass. Eye and Ear cornea surgeon and senior author of the paper.

Using a unique mouse model of adenovirus keratitis, Dr. Chodosh and

his team studied the role of viral components in the cornea to determine which viral part(s) induce an [innate immune response](#). The authors found that neither viral DNA nor viral gene expression was necessary for inflammation. In contrast, viral capsid, the [protein coat](#) of the virus, induced inflammation similar to intact virus. Mice lacking the toll-like receptor 9 molecule, which acts as a pathogen DNA-sensing molecule within the cell, developed clinical inflammation upon adenovirus infection similar to wild type mice. Virus associated inflammation in the mouse cornea could be blocked by a treatment with a peptide containing components of the adenoviral capsid. Adenovirus infection of the cornea induces inflammation principally through contact between the viral capsid and the host cell.

"Our study provides new insights into how the innate immune system in the eye responds to a clinically important viral pathogen," Dr. Chodosh said. "With the new understanding, we are a step closer to developing a treatment for this common - and highly contagious - eye condition."

Provided by Massachusetts Eye and Ear Infirmary

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