

'Smart' contact lenses could predict your risk of suffering a common cold

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Why is it that there are some people who can go a whole winter without so much as a sniffle, whilst others seem to catch every common cold that comes their way?

A new study from Bangor University's Extremes Research Group at the School of Sport, Health & Exercise Sciences, showed that it could be possible to predict the likelihood of participants succumbing to common cold symptoms by analyzing the level of antibodies in tear fluid.

Secretory immunoglobulin A (SIgA) is an important antibody that acts as a 'first line of defence' to prevent viruses and bacteria from entering the body. SIgA is abundant in mucosal secretions such as saliva, tears and

nasal discharge, as well as in airway mucous and the gut.

By collecting minute samples of tear fluid from the lower eye lid and analyzing SIgA Prof. Neil Walsh and his team observed that individuals with low levels of tear fluid SIgA were up to nine times more likely to experience common cold symptoms within the following week, compared to individuals with normal levels of tear SIgA secretion. Furthermore, when an individuals' tear SIgA fell by ~30%, their risk of catching a common cold increased six fold.

Further investigations revealed a reduction of tear SIgA after a prolonged exercise stress; an effect known as the 'open-window' whereby [immune function](#) is temporarily compromised after heavy exercise leaving individuals more susceptible to infections such as the common cold.

Prof Walsh explained: "Real-time, non-invasive approaches to monitoring immune function are in particular demand to assess how an athlete responds to training. Whilst strenuous training increases fitness and performance, prolonged heavy training, and other stressors, can decrease immune function and increase an individual's risk of suffering a [common cold](#), and possibly other infections."

Walsh and his colleagues are the first to explore the potential of tear fluid analysis to detect changes in immune function and the incidence of respiratory infection. Recently, tear fluid has attracted substantial interest as a medium for noninvasive monitoring of other biomarkers. In 2012, Walsh and colleagues demonstrated that tear fluid could be used to assess hydration status through use of a point-of-care osmolarity device, and last year Google and Novartis unveiled a 'smart' contact lens capable of detecting blood glucose levels for diabetic patients.

Says Walsh: "It may not be long before we see tear immune measures

integrated into 'smart' contact lenses capable of continuously monitoring host defence and infection risk."

More information: Tear Fluid SIgA as a Noninvasive Biomarker of Mucosal Immunity and Common Cold Risk. *Med Sci Sports Exerc.* 2015 Oct 22. [Epub ahead of print].

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Provided by Bangor University

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