

Retina's cancer-like metabolism could lead to new treatments

December 5 2014, by Kate Bourne

Eye surgeons at the University of Adelaide have discovered that the retina in human eyes uses energy in a very similar way to cancer, which could lead to improved understanding of cancers as well as eye disease such as macular degeneration.

Staff from the University's Discipline of Ophthalmology and Visual Sciences have been studying the retina – the light-sensitive layer at the back of the eye – to better understand a range of optical diseases.

Their findings, published in the journal *Clinical & Experimental Ophthalmology*, have implications for the further study of both eye diseases and cancer.

"The retina contains specialised nerve cells and is considered part of the brain, but we've discovered that the way it processes energy is much more similar to a cancer cell than a brain cell," says lead author Professor Robert Casson, Head of Ophthalmology and Visual Sciences at the University.

"Cancer cells use glucose to generate energy and to make building materials so they can divide and grow.

"The retina doesn't divide and grow, but it does have similar requirements for energy production. It needs to make large amounts of a protein which detects light and is constantly renewed so that we can keep seeing.

"Cancer cells have a special molecule which switches the cell metabolism between energy production and growth. The molecule, called PKM2, is used as a marker of some types of cancer.

"We've discovered that the same molecule exists in the retina," Professor Casson says.

Professor Casson says the findings raise a number of interesting questions: "Could abnormalities of this system cause retinal diseases? If so, new treatments could be developed for blinding diseases like [macular degeneration](#).

"PKM2 is also thought to be involved in the formation of cancers. But the adult retina doesn't get cancer. What stops cancer formation in the retina?"

And Professor Casson offers a word of caution: "Cancer researchers have been investigating drugs that inhibit PKM2 as a potential treatment for cancer. They should be aware of possible effects to the [retina](#) and vision."

More information: "Cancer-like metabolism of the mammalian retina." *Clinical & Experimental Ophthalmology*.

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