



Method of Visualizing Drusen in the Eye

Summary

The inventors discovered that hydroxyapatite (HAP) spherules are associated with drusen in patients. The formation of drusen is associated with age-related macular degeneration (AMD). The inventors have hypothesized that the HAP spherules are important in initiating the formation of the drusen. Early detection of hydroxyapatite spherules may provide a method to diagnose AMD much earlier than can be done using current ophthalmic examination methods. The disclosed invention identifies optical labels that preferentially bind to HAP and a method for detecting these HAP spherules using the optical labels.

Key Investigator

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Field

Ophthalmology
 Geriatric

Technology

AMD diagnostic

Advantages

Early detection of drusen a key indicator for AMD

Status

Available for licensing
 Available for sponsored research

Patent Status

EP2890983
 US20150231279
 Provisional Patent

UMB Docket Reference

RT-2012-010
 RT-2016-123

External Reference

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 112:1565-1570

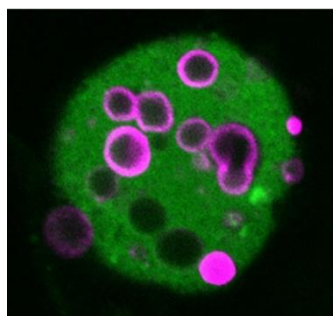
Market

AMD affects 1 in 5 people over 75, causing their vision to slowly deteriorate. The ability to spot the disease early and reliably halt its progression would improve the lives of millions. AMD is one of the leading causes of blindness worldwide. A Lancet Global Health study estimates that nearly 196 million patients will be diagnosed with AMD by 2020 and that by 2040 that number will increase to nearly 288 million. AMD is ranked third by the WHO as a priority eye disease, eclipsed only by cataracts and glaucoma in importance. It has been estimated that AMD represents a \$35.4 billion economic burden in the US alone.



Technology

Drusen are yellow fatty protein deposits under the retina. The formation of drusen increases the risk of a person developing “dry” age-related macular degeneration (dry AMD). The inventor has previously disclosed in published work the surprising finding that these deposits contained tiny hydroxyapatite (HAP) spherules. It has been hypothesized that these HAP spherules are an important in initiating the formation of drusen. Because the HAP spherules develop many years prior to the visibility of drusen, this finding may provide an attractive new approach for early identification and treatment of AMD. Detecting the HAP spherules and preventing their further growth could also be a possible treatment for AMD.



An image of HAP deposits, surrounded by fat and protein. The HAP is pink, while the surrounding material is green.
 Source: University College, London

The disclosed inventions identify compounds (labels) that bind to HAP and whose fluorescence is characteristics differ in the unbound and bound state. The disclosed labels show

binding specificity to HAP. The labels will permit early and accurate detection of HAP deposits which are associated with the formation of drusen. The labels will allow the one to diagnosis and monitor the progression of age-related macular degeneration using a non-invasive method like fluorescence ophthalmoscopy. It has been shown that drusen formation is an indicator for the development of age-related macular degeneration (AMD). The disclosed invention also discloses a method for using the labels to diagnosis and monitor the progression of age-related macular degeneration.

Technology Status

Technology demonstrated using cadaver eyes.