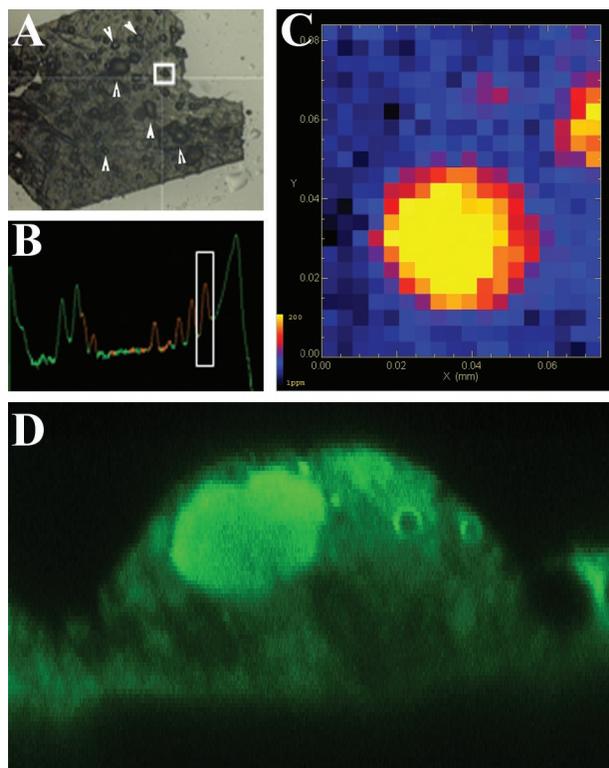


NSLS Research Links Zinc to Age-Related Macular Degeneration

At the NSLS, a team of researchers has discovered that the mineral zinc may play a role in the development of age-related macular degeneration (AMD), the leading cause of blindness among elderly people in the developed world.

One of the hallmarks of AMD is the accumulation of protein and lipid rich deposits in a part of the



Zinc depositions in age-related macular degeneration. A) Sub-RPE deposits, which are early hallmarks of AMD, can be visualized on bright field images of whole mounted donor tissues. This image depicts the appearance of deposits under a laboratory microscope. While small deposits are invisible during an eye examination, large (>125 μm) drusen are indicative of AMD. B) Following calibration using external standards, the zinc concentration of individual deposits (one highlighted by the white box on Fig. A) were determined from the μSXRF spectrum. C) Results from μSXRF are shown on a 2-dimensional false color image. Each pixel on this image represents a $4 \times 4 \mu\text{m}$ area of the tissue. D) Optical cross section of a druse labeled by the zinc-specific fluorescent sensor ZP1 showed heterogeneous zinc distribution, suggesting the presence of "hotspots" for zinc deposition that could represent the seeding points for drusen formation and might be relevant in the development and progression of AMD.

eye called Bruch's membrane. The underlying mechanisms of this deposit formation are not clear, but because zinc is known to contribute to deposit formation in neurodegenerative diseases such as Alzheimer's disease, the researchers decided to explore the role zinc might play in AMD. Using x-ray fluorescence mapping at beamlines X26A and X27A, the group measured the concentration of zinc in nine post-mortem human eyes with AMD. The results, published in the April 2007 edition of *Experimental Eye Research*, show unexpectedly high levels of zinc in the deposits, indicating that the mineral might indeed contribute to the development and progression of AMD.

Led by Imre Lengyel, of University College of London, the research team included Jane Flinn, David Linkous, and Katherine Cano, all of George Mason University; Tunde Peto from Moorfields Eye Hospital, London; Alan Bird, University College of London; Antonio Lanzirotti, University of Chicago; Christopher Frederickson, NeuroBioTex, Inc.; and Frederik van Kuijk, University of Texas Medical Branch.

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To read the BBC News article about the research, go to: <http://news.bbc.co.uk/2/hi/health/6457427.stm>

— Kendra Snyder