Age-Related Macular Degeneration (AMD) is a common disease of the centre of the retina, primarily affecting those aged over 50. The first signs of the disease are so-called drusen, which occur under the retina in the form of round, yellow deposits. However, in some way that has not yet been unexplained, these disappear over time, leaving no trace, and this, in itself, is a sign that there is a very high risk of developing advanced AMD and going blind. Hrvoje Bogunovic from MedUni Vienna's Department of Ophthalmology has now developed a computer model that can be used with Optical Coherence Tomography (OCT) to analyse which drusen will survive and which will disappear: "This is a promising marker for progression of the disease."

Optical Coherence Tomography allows retinal diseases to be detected in high-resolution detail – even in the early stages. "This gives us a non-invasive technique for looking into the retinal layers, so that we can detect minute changes early on," explains Bogunovic. However, reliable and standardised interpretation of the OCT data is only possible by means of computerised analyses. "Our findings are a promising step towards image-guided prediction of the progression of age-related macular degeneration. Our model enables us to compile a drusen atlas, as it were, which we can then use to predict, in the case of each individual patient, which are at greater risk of disappearing. This is precisely what we now want to evaluate in further clinical studies."

Each year, around 2.5 million people worldwide develop macular degeneration and it is the commonest cause of blindness in industrialised countries. Every year, around 30,000 people undergo OCT examinations at the Department of Ophthalmology at MedUni Vienna/Vienna General Hospital, which is the largest department of its kind in Europe.

More information: Yu Wang et al. Machine
learning based detection of age-related macular degeneration (AMD) and diabetic macular edema (DME) from optical coherence tomography (OCT) images, Biomedical Optics Express (2016). DOI: 10.1364/BOE.7.004928

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