

# Retinal Stress Measurement May Identify Diabetes

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A noninvasive imaging method that measures metabolic stress in the retina will likely become very useful in detecting diabetes early and monitoring disease progression, researchers said.

In a small study published in the *Archives of Ophthalmology*, levels of flavoprotein autofluorescence in the retina were found to distinguish between sub-

jects with diabetes and control subjects, regardless of disease duration or severity.

"Hyperglycemia induces mitochondrial stress and apoptotic cell death in diabetic tissues soon after disease onset and before involvement can be detected by any other current clinical diagnostic method," said Matthew G. Field of the University of Michigan, Ann Arbor, and his associates.

Abnormally increased oxidation of mitochondrial flavoproteins causes them to emit green autofluorescence, which can be

measured in the retina using a modified fundus camera and customized computer hardware and software.

Mr. Field and his associates measured flavoprotein autofluorescence in 21 subjects with type 1 or type 2 diabetes (mean disease duration, 10 years) and 21 age-matched healthy control subjects who had normal glucose tolerance, blood pressure, and lipid profiles.

The subjects with diabetes consistently showed significantly elevated levels of reti-

nal flavoprotein autofluorescence, compared with controls, regardless of whether retinopathy was present.

"In fact, 9 of 21 cases had no visible retinopathy, indicating that retinal metabolic stress due to diabetes is present before any visible retinopathy," the investigators said (*Arch. Ophthalmol.* 2008;126:934-8).

Two of Mr. Field's associates have founded OcuSciences Inc. to commercialize the technology used in this study. Mr. Field did not disclose any conflicts of interest. ■



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