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# Clinical detection and monitoring of pre-cataractous lens changes using a dynamic (or Quasi-elastic) light scattering device

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Cataract remains the main cause of blindness in world, and medical treatment is needed. Recently, Alpha crystallin proteins have been found to act as built-in anti-cataract lens proteins, functioning as molecular chaperones to protect other lens proteins from oxidative stress damage, thereby preventing cataracts from forming. We have developed a Dynamic Light Scattering clinical device (DLS) that can measure alpha crystallins in the lens clinically (as Alpha CrystallinIndex or ACI). Results from a large cross sectional study conducted at the NEI/NIH on patients with age related cataracts and normal controls showed that alpha crystallin protects the lens from nuclear cataract formation and that loss of ACI over time is associated with nuclear cataract formation and progression. This study suggested that ACI may be a useful measure of protective alpha crystallin molecular chaperone reserve in the lens, analogous to creatinine clearance in estimating renal functional reserve.

We recently conducted a longitudinal study at the Wilmer Eye Institute of Johns Hopkins Hospital on 45 patients (66 eyes) followed every 6 months for a mean of 19 months (range, 6-35.5 months). We found that those eyes with the highest levels of ACI were least likely to develop cataracts and those with the lowest levels of ACI had the highest risk for cataract and cataract surgery.

Since DLS detects loss of ACI associated with oxidative stress damage to lens proteins, ACI may be useful as a biomarker for oxidative stress damage to other body tissues resulting in aging and age related diseases.

## Biography

Manuel B. Datiles III, M.D. is a medical officer, senior attending ophthalmologist, senior clinical investigator and former chief of the OGCSB cataract section for the National Eye Institute-NIH. He conducts studies on the pathogenesis of cataracts and development of anti-cataract agents. He has published over a hundred papers in the major ophthalmology journals and serves as an ad hoc editorial board member and reviewer for these major ophthalmic journals. He sees consult eye patients from within NIH including those with ocular graft versus host disease, and is visiting lecturer at the Wilmer Eye Institute of Johns Hopkins University Hospital.

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