Rescuing retinal cells *in vitro* in age-related macular degeneration

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Age-related macular degeneration is one of the primary causes of blindness in the United States as well as worldwide. The purpose of the present *in vitro* study was to test the hypothesis that natural compounds will rescue RPE cells from AMD mitochondria-induced damage, thereby rescuing AMD retinal cells. Our long-term goal is to develop a personalized treatment strategy for AMD patients. Herein, we treated AMD RPE transmitochondrial cells with naturally occurring antioxidants and neuroprotective compounds that are available as over-the-counter medications. AMD RPE transmitochondrial cells had identical nuclei but differed in mitochondrial DNA (mtDNA) content. Cell survival, free radical production, oxidative stress, and mitochondrial health was examined and compared between untreated AMD cells and the AMD cells treated with natural compounds. Treatment with natural compounds improved cell survival and mitochondrial health, reduced free radicals and oxidative stress, mitigated cell death, and increased live cell number in AMD cells compared to their untreated counterparts ($p<0.05$). In conclusion, the natural compounds used in this study might serve as effective, inexpensive, and non-invasive therapeutic options and might help in the development of a personalized treatment strategy for AMD patients.