

Abstract Submitted
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Kinetics of Lipofuscin Formation in Aging Retinal Pigment Epithelium Cells FEREDDOON FAMILY, Emory University, K.I. MAZZITELLO, C.M. ARIZMENDI, University of Mar del Plata, HANS E. GROSSNIKLAUS, Emory University — Lipofuscin is a deposit that is formed over time by aggregation and clustering of incompletely degraded membrane material in various types of cells. Lipofuscin is made of free-radical-damaged protein and fat and is known to be present in age-related macular degeneration (AMD), Alzheimer disease, and Parkinson disease. AMD is the leading cause of blindness in adults. The degradation of retinal pigment epithelium cells (RPE) through accumulation of lipofuscin is considered a significant pathogenic factor in the development of AMD. We will present the results of a study of the kinetics of lipofuscin growth in RPE cells using Kinetic Monte Carlo simulations and scaling theory on a cluster aggregation model. The model captures the essential physics of lipofuscin growth in the cells. A remarkable feature is that small particles may be removed from the cells while the larger ones become fixed and grow by aggregation. We compare our results with the number of lipofuscin granules in eyes with early age-related degeneration.

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