

Stochastic Model of Eye Lens Growth

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Biological lens in the eye of a mammal focuses light on the retina. Its shape and size is crucial for that purpose. We base our work on abundance of data collected at Washington University in St Louis, mostly on mice. We provide the first ever growth model of the mouse eye and succeed in capturing a variety of behavior about the size of the lens, number of cells in the anterior capsule of the lens (epithelium) and the dynamics of the cell movement between the various zones of the epithelium. Lens grows through the entire life and exhibits significantly different behavior throughout life. Our model is based on branching processes with immigration and emigration. (This is a joint work with Steven Bassnett and members of his lab at Washington University. Research supported by NIH grant R01 EYO9852 and a Marie Curie FP7-PEOPLE-2013-IOF-622890 MoLeGro Fellowship.)