Figure Legends for supplementary data.

Supplementary Figure 1. EdU-labeled cells are progressively incorporated into the fiber cell mass. Orthogonal views (x,z green; y,z red; and x,y, blue) through the epithelium and superficial lens cortex 1 week (A) or 4 weeks (B) after EdU labeling. S-phase cells (green) are first detected in the epithelium (A) but, by four weeks, have been incorporated into the fiber cell mass.

Supplementary Video.

Penny Pusher model of lens epithelial cell proliferation and migration. The animated sequence covers an 11 day period. A portion of the peripheral epithelium (corresponding to ~10 degrees of longitude) is shown. Lens epithelial cells are represented by pennies. The rate of cell division in the GZ is set at 5% and 0.5% in the PGZ. The number of cells produced in each zone per day is calculated from the labeling index (5% and 0.5%, respectively for GZ and PGZ), the total number of cells in the zone and the assumption that S-phase lasts 12 hours. The position of each cell is defined in relation to grid coordinates on either side of the trapezoid. A suitable number of proliferating cells are selected at random using an online random number generator (http://www.random.org/). Cell division is simulated by inserting a penny next to a randomly chosen cell. To follow cell lineages some cells are painted white. White cells have the same chance of dividing as non-white cells (5% or 0.5% per day, depending on the zone). However, when white cells divide they produce white progeny. As the simulation runs, cells are progressively displaced through the PGZ, GZ and TZ. Cells accelerate as they move through the various zones due to the cumulative “push” of cell divisions occurring in the layers above them. Hexagonal packing of cells is not established in the PGZ or GZ because the continuous insertion of new cells breaks the lattice. White cells are less numerous than non white cells. Therefore, more non-white cells are inserted into the population over time, leading to a reduction in the number of white cells. However, multiple rounds of cell division may occur within the proliferative zones and this will produce clonal clusters of white cells.