Supplementary Figure Legend

Figure S1. Method for measuring basal endfoot width. (A-B') At 14 hpf, a 25 μm radius circle (*yellow*) was centered at the vertex of the optic stalk furrow. (C-D') At 24 hpf, a 25 μm circle (*yellow*) was centered at the deepest point of the lens-retina interface. In all cases, basal surface length was measured using ImageJ. Within the circle, the number of cells in contact with the basal surface was counted (*magenta dots*). Average basal endfoot width was calculated by dividing the basal surface length by the number of

cells in contact with it. (A-D) Single confocal sections for measurements. (A'-D') Zoomed images. Numbers in bottom right insets are numbers of cells in contact with the basal surface in that image.
Dorsal views; scale bar, 50 μm. A, anterior; P, posterior; M, medial; L, lateral.

Supplementary Movie Legends

Movie S1. Timelapse of *lama1*^{UW1} wildtype sibling optic cup morphogenesis, 12.5-24.5 hpf. Single optical section from a 4-dimensional dataset shown. Time interval between z-stacks, 3.43 minutes. Dorsal view. EGFP-CAAX (membranes, *green*), H2A.F/Z-mCherry (nuclei, *magenta*).

Movie S2. Timelapse of *lama1*^{UW1} mutant optic cup morphogenesis, 12.5-24.5 hpf. Loss of lama1 leads to multiple morphogenetic defects. Single optical section from a 4-dimensional dataset shown. Time interval between z-stacks, 3.43 minutes. Dorsal view. EGFP-CAAX (membranes, *green*), H2A.F/Z-mCherry (nuclei, *magenta*).

Movie S3. Timelapse of focal adhesion assembly, as reported by EGFP-vinculin (*grayscale*), during optic stalk furrow formation and movement in *lama1*^{UW1} control sibling, ~12-14 hpf. Focal adhesions are assembled at the site of furrow formation. Timelapse of 3-dimensional renderings (4D movie) shown. Time interval between z-stacks, 3.5 minutes. Dorsal view. Note that fluorescence quantification was performed on single slices, as shown in Fig. 3.

Movie S4. Timelapse of focal adhesion assembly, as reported by EGFP-vinculin (*grayscale*), during optic stalk furrow formation and movement in *lama1*^{UW1} mutant, ~12.5-14.5 hpf. Focal adhesion assembly is diminished at the site of furrow formation, and anterior movement of the furrow is impaired. Timelapse of 3-dimensional renderings (4D movie) shown. Time interval between z-stacks, 3.5 minutes. Dorsal view. Note that fluorescence quantification was performed on single slices, as shown in Fig. 3.

Movie S5. Timelapse of focal adhesion assembly, as reported by EGFP-vinculin (*grayscale*), during optic cup invagination in *lama1*^{UW1} control sibling, ~16-24 hpf. A domain of EGFP-vinculin coalesces at the retina-lens interface. Timelapse of 3-dimensional renderings (4D movie) shown. Time interval between z-stacks, 3.5 minutes. Dorsal view. Note that fluorescence quantification was performed on single slices, as shown in Fig. 3.

Movie S6. Timelapse of focal adhesion assembly, as reported by EGFP-vinculin (*grayscale*), during optic cup invagination in *lama1*^{UW1} mutant, ~16-24 hpf. Recruitment of EGFP-vinculin to the retina-lens interface is increased compared to control embryos. Timelapse of 3-dimensional renderings (4D movie) shown. Time interval between z-stacks, 3.5 minutes. Dorsal view. Note that fluorescence quantification was performed on single slices, as shown in Fig. 3.

Movie S7. Timelapse of retinal progenitor cell behaviors in *lama1*^{UW1} control sibling optic cup morphogenesis, 13-24 hpf. Cells display active lamellipodial protrusions through ~20 hpf, and extend, spanning the width of the retina by 24 hpf. Maximum intensity projection of photoconverted Kaede (*grayscale*) to visualize entire cell morphology. Time interval between z-stacks, 4.22 minutes. Dorsal view.

Movie S8. Timelapse of retinal progenitor cell behaviors in *lama1*^{UW1} mutant optic cup morphogenesis, 13-24 hpf. Cells display active lamellipodial protrusions through ~20 hpf, and appear to extend normally, but lose apicobasal register with neighbors, resulting in a prematurely and aberrantly layered retina. Maximum intensity projection of photoconverted Kaede (*grayscale*) to visualize entire cell morphology. Time interval between z-stacks, 4 minutes. Dorsal view.

Movie S9. Movie through a z-stack of *lama1*^{UW1} control sibling optic cup, 24 hpf. Note that retinal progenitors all appear oriented with the long axis pointing toward the lens. Dorsal view. EGFP-CAAX (membranes, *green*), H2A.F/Z-mCherry (nuclei, *magenta*).

Movie S10. Movie through a z-stack of *lama1*^{UW1} mutant optic cup, 24 hpf. While some retinal progenitors are oriented with their long axis pointing toward the lens, many retinal progenitors appear to be misoriented within random domains of the retinal neuroepithelium. Dorsal view. EGFP-CAAX (membranes, *green*), H2A.F/Z-mCherry (nuclei, *magenta*).

Movie S11. Timelapse of apical polarity in *lama1*^{UW1} control sibling optic cup morphogenesis, 13-24 hpf. One coherent apical surface is apparent after optic vesicle evagination. The apical surface remains intact and stretches itself during the process of optic cup formation. Timelapse of a single optical section from a 4D dataset of pard3-GFP (*grayscale*) to visualize the apical epithelial surface. Time interval between z-stacks, 4.5 minutes. Dorsal view.

Movie S12. Timelapse of apical polarity in *lama1*^{UW1} mutant optic cup morphogenesis, 13-24 hpf. After optic vesicle evagination, no single coherent apical surface is apparent. As optic cup morphogenesis proceeds, pard3-GFP puncta coalesce into multiple random domains. Timelapse of a single optical section from a 4D dataset of pard3-GFP (*grayscale*) to visualize apical epithelial surfaces. Time interval between z-stacks, 4.5 minutes. Dorsal view.