**Supplementary Figure 1** Model for ephrin-A induced targeting of eye-specific retinogeniculate projections. Schematic of the ferret retinogeniculate pathway (horizontal plane) and eye-specific visuotopic map, adapted from Akerman, et al., 2003. Retinas are shown in green or red; each includes a central>peripheral gradient of EphAs (black>white gradient). The line of decussation (yellow line) is shown for each retina. There is an outer>inner gradient of ephrin-As in the LGN (purple>white gradient). A gray and a white ferret are shown in the visual field. Their representations are depicted within each retina and LGN. For RGC axons in the two eyes that view the same location in visual space (e.g., the orange arrowhead at head-neck junction of the white ferret) there are relatively higher levels of EphAs in the contralateral eye RGCs versus the ipsilateral eye RGCs (orange arrowheads #1 and #2, respectively). The axons from these two populations of RGCs send axons to the same line of projection (orange dashed line, right LGN) but different eye-specific layers in the LGN. For each location in visual space, the relatively higher levels of EphA in the contralateral projecting RGCs (e.g., arrowhead #2) combined with the outer>inner gradient of ephrin-As in the LGN, cause the contralateral eye axons to project to the more inner LGN than the ipsilateral projecting RGCs that view the same location in visual space (arrowhead #1), along the corresponding line of projection in the LGN; the ipsilateral axons therefore map to the relatively more outer LGN (A1). O.C., optic chiasm.

**Reference**