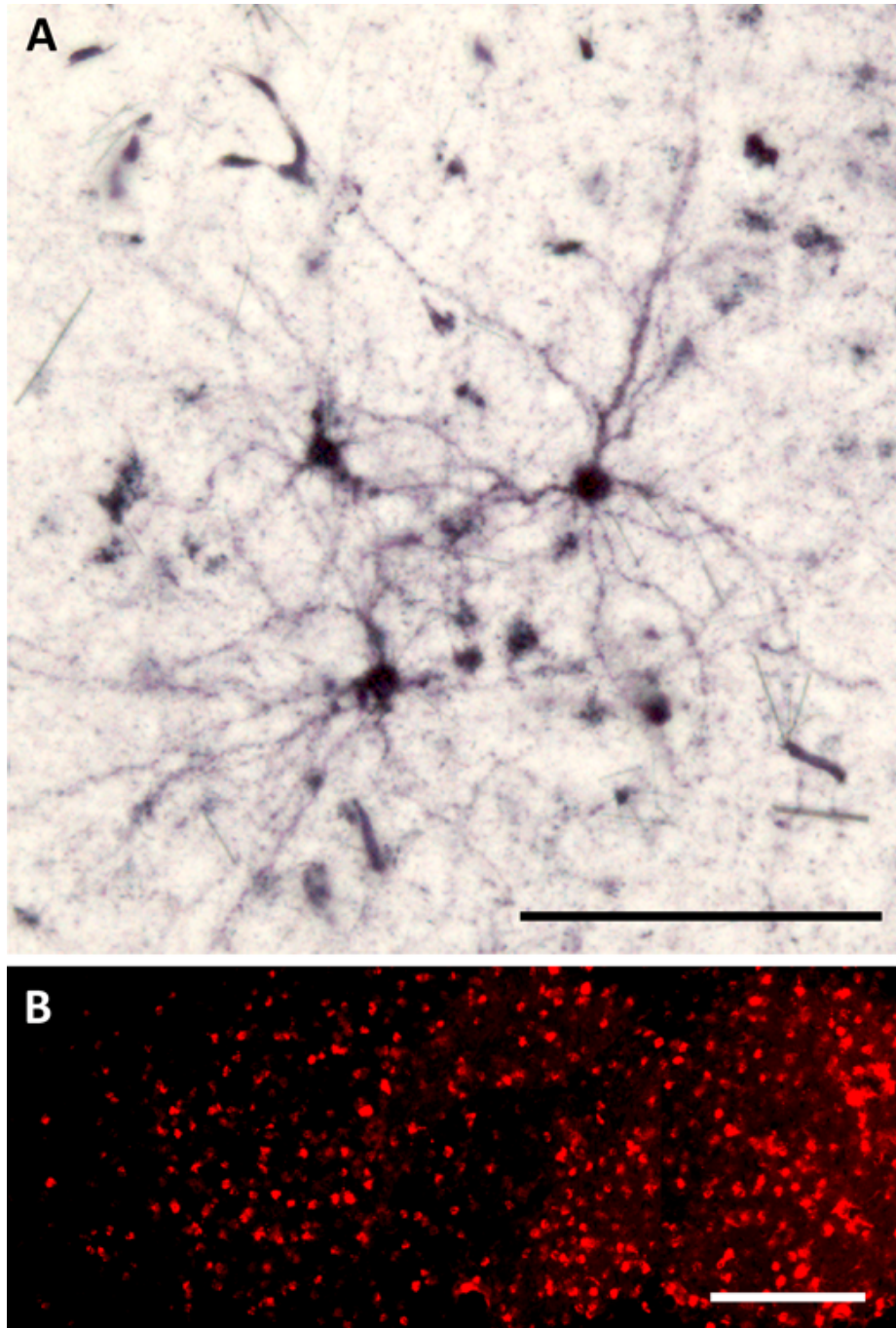
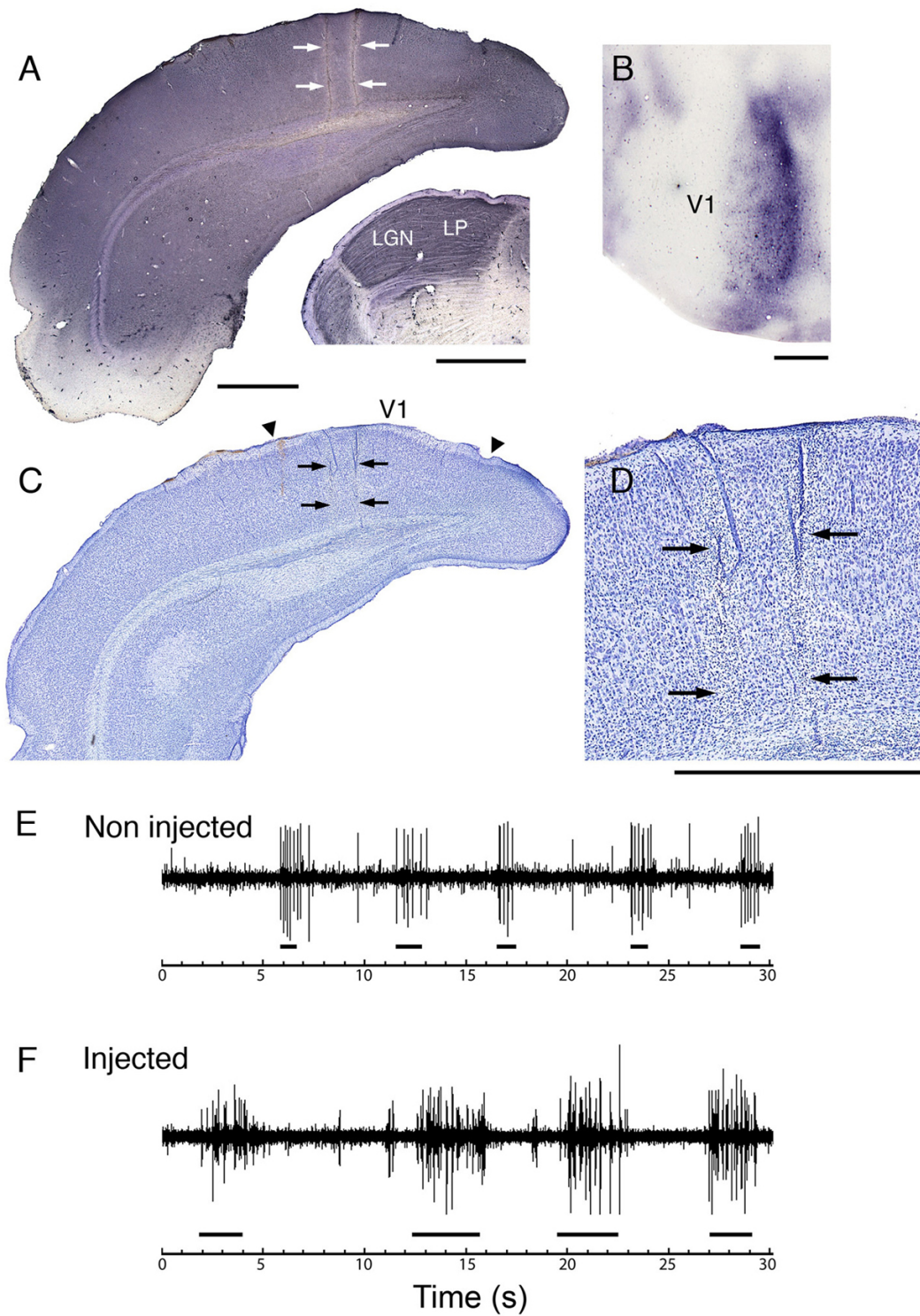


Supplementary Figure 1. Pattern of WGA-HRP-labeling across cortical layers. (A) Patterns of labeling in the hemispheres contralateral (left) and ipsilateral (right) to the eye injected with WGA-HRP. Upper and lower arrows point to dense labeling in layers IV and VI, respectively. Black triangles indicate borders of V1. (B) Magnified views of cytoarchitecture (left panel) and WGA-HRP labeling (right panel) from V1 ipsilateral to the injected eye. Roman numerals indicate cortical layers. Scale bars = 500  $\mu$ m.



Supplementary Figure 2. (A) High-magnification view of HRP-labeled callosal cells located in the region within the box in Fig. 9A. Retrogradely labeled somas and dendrites appear darkly stained. (B) Image captured under epifluorescence of callosal cell labeled retrogradely with RB in the region within the box in Fig. 5C. This image is a montage from one of the tangential sections used in the reconstruction of the RB-labeled callosal pattern shown in Fig. 5C. Scale bars = 100  $\mu$ m.



Supplementary Figure 3. Cytoarchitecture and cell responsiveness in V1 following multiple intracortical injections of HRP. (A) Coronal section through the injected cortex showing widespread HRP labeling. White arrows indicate the tracks of two of the HRP injections. The inset shows widespread HRP labeling in the thalamus ipsilateral to the HRP injections in the same animal. (B) Pattern of HRP-labeled callosal connections in

V1 revealed in tangential sections from the opposite hemisphere in the same animal. (C) Nissl-stained section through the injected hemisphere in the same animal. (D) Magnified view taken from (C). Black arrows in (C) and (D) indicate the location of injection tracks shown in (A). (E, F) Examples of responses driven by the contralateral eye in lateral V1 from (E) rat not injected with HRP, and (F) from rat injected with HRP shown in (A-D). The black line segments indicate when light stimulus was present. LGN = lateral geniculate nucleus, LP = lateral posterior nucleus. Scale bars = 1.0 mm.