

**Title: Supplementary movie 1**

**Description:** Dye penetration in control third instar larvae. 10 kDa Texas-Red conjugated dextran was injected into the neuropil of one brain hemisphere of a control third instar larva with the genotype [*83E12-Gal4, UAS-CD8::GFP*] about 5 minutes after preparation. Diffusion of the dye to the contralateral side was imaged for 25 minutes. A time stamp in minutes is indicated. The first 10 minutes were quantified (see Figure 5c).

**Title: Supplementary movie 2**

**Description:** Dye penetration in ensheathing glia ablated third instar larvae. 10 kDa Texas-Red conjugated dextran was injected into the neuropil of one brain hemisphere of a control third instar larva with the genotype [*UAS-rpr; 83E12-Gal4<sup>AD</sup> repo-Gal4<sup>DBD</sup>, UAS-hid*] about 5 minutes after preparation. Diffusion of the dye to the contralateral side was imaged for 20 minutes. A time stamp in minutes is indicated. The first 10 minutes were quantified (see Figure 5c).