**Supporting information**

**Supplementary Fig. 1. Disc region did not have any non-specific binding or background tissue autofluorescence.** Confocal images of L5-6 motion segments under specific channel filters (for AlexaFluor488 and AlexaFluor555) after incubation without any antibodies (top row, IgG control) and without primary antibodies (bottom row, negative control). Scale bar = 500 µm.

**Supplementary Fig. 2. Axonal dieback compound injection did not affect NP cellularity, while disc injury significantly reduces NP cellularity and distribution.** (a) H&E images of NP in L5-6 discs injected with 1X PBS control or 1 mM Pyr, 100 nM Vcr, and 500 nM Vcr from the safety study. (b) H&E images of NP in Sham, Injured, Injured + Pyr and Injured+Vcr L5-6 discs from the efficacy study. Arrows point to examples of NP lacunae in injured discs. Scale bar = 500 µm.