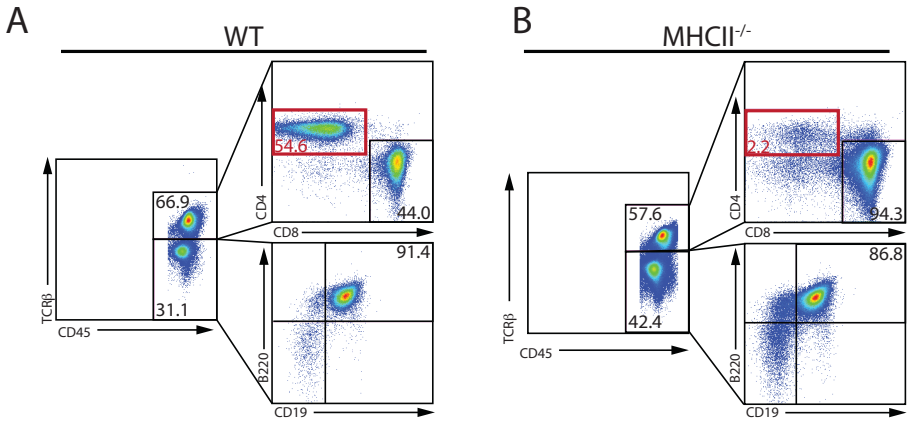

Figure S1*: MHC-II$^{-/-}$ mice have normal B cell and CD8^{+} T cell populations, but lack CD4^{+} T cells.* Flow cytometry of the deep cervical lymph nodes of wild type (**A**) and MHCII$^{-/-}$ (**B**) mice showing CD4^{+} and CD8^{+} lymphocytes in the TCRβ^{+} population and CD19^{+}B220^{+} B cells in the CD45^{+}TCRβ^{-} population. Numbers indicate percent CD4^{+} (upper left) and CD8^{+} (lower right), as a percentage of TCRβ^{+} cells and CD19^{+}B220^{+} B cells as a percentage of the CD45^{+}TCRβ^{-} population.

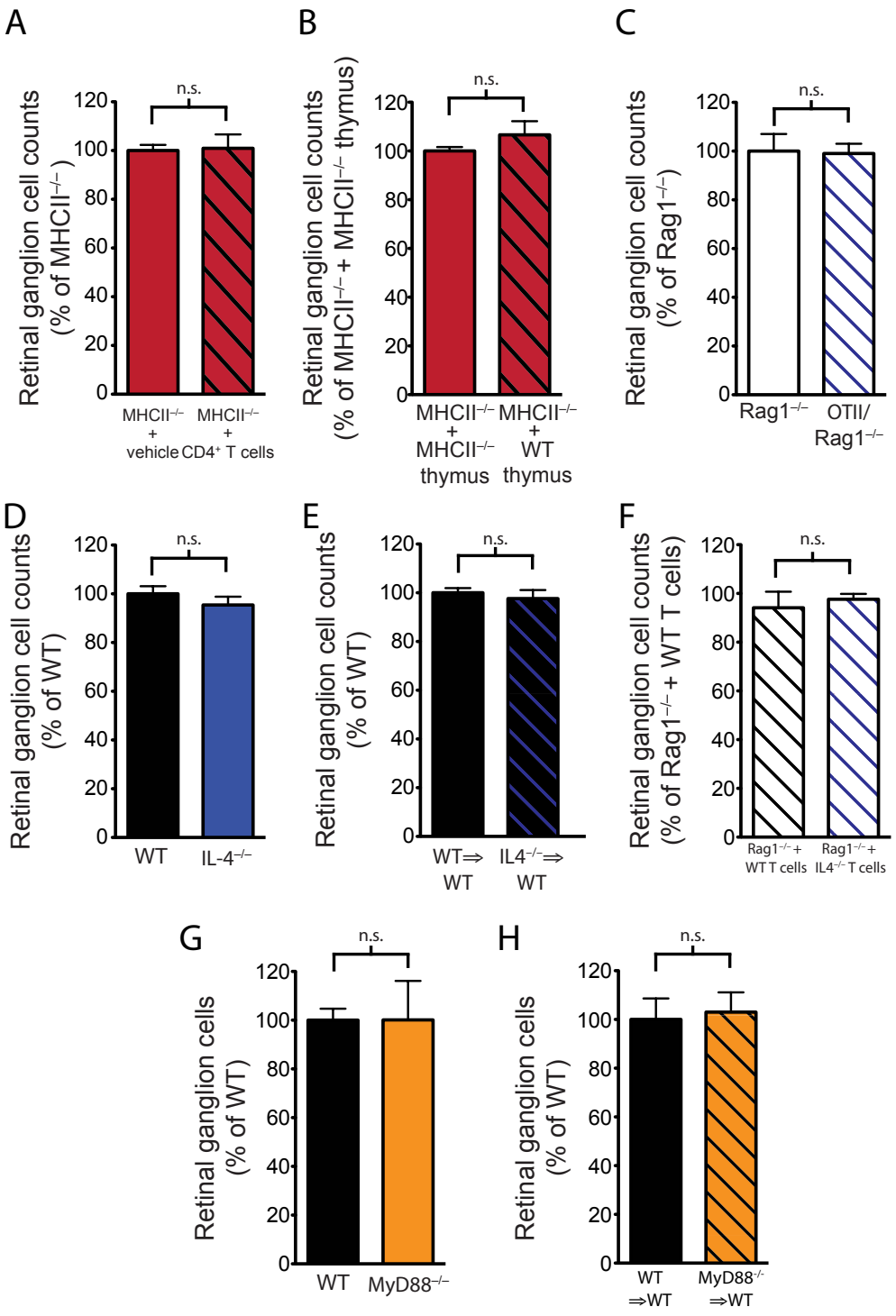

Figure S2*: No difference in contralateral, uninjured retinas of all mouse strains and experimental manipulations examined in this manuscript.* (**A**) MHCII$^{-/-}$ mice injected with 3 x 10^6 wild type CD4$^+$ T cells on the day of injury exhibit no difference in neuronal counts in the uninjured retinas compared to those injected with saline. Retinal ganglion cell counts (% of MHCII$^{-/-}$) of MHCII$^{-/-}$ mice and MHCII$^{-/-}$ mice injected with wild type

$CD4^+$ T cells as assessed by Fluoro-Gold staining (n = 3, wild type thymus; n = 3 $MHCII^{-/-}$ thymus; Student's t-test). (**B**) $MHCII^{-/-}$ mice implanted with wild type thymi exhibit no difference in neuronal counts in the uninjured retinas compared to those implanted with $MHCII^{-/-}$ thymi. Retinal ganglion cell counts (% of $MHCII^{-/-}$ + $MHCII^{-/-}$ thymus) of $MHCII^{-/-}$ mice implanted with either a $MHCII^{-/-}$ or wild type thymi (six weeks after implantation) as assessed by Fluoro-Gold staining (n = 5, wild type thymus; n = 8 $MHCII^{-/-}$ thymus; Student's t-test). (**C**) OTII/$Rag1^{-/-}$ mice exhibit no difference in retinal ganglion cell number in the uninjured retinas compared to $Rag1^{-/-}$ mice. Retinal ganglion cell counts (% of $Rag1^{-/-}$) of $Rag1^{-/-}$ and OTII/$Rag1^{-/-}$ mice assessed by Fluoro-Gold staining (n = 3, $Rag1^{-/-}$; n = 3, OTII/$Rag1^{-/-}$; Student's t-test). (**D**) IL-$4^{-/-}$ mice exhibit no difference in retinal ganglion cell number in the contralateral retinas compared to wild type mice. Bar graphs represent retinal ganglion cell counts (% of wild type) of IL-$4^{-/-}$ or wild type mice, assessed by Fluoro-Gold staining (n = 5, wild type; n = 5, IL-$4^{-/-}$; Student's t-test). (**E**) Mice transplanted with IL-$4^{-/-}$ bone marrow exhibit no difference in retinal ganglion cell number in the contralateral retinas compared to those transplanted with wild type bone marrow. Retinal ganglion cell counts (% of wild type ⇒ wild type) of wild type ⇒ wild type or IL-$4^{-/-}$ ⇒ wild type bone marrow chimeras. Bone marrow was allowed to engraft for 6 weeks before optic nerve injury, and retinal ganglion cell counts were assessed by Fluoro-Gold staining (n = 3, wild type bone marrow; n = 3, IL-$4^{-/-}$ bone marrow; Student's t-test). (**F**) $Rag1^{-/-}$ mice receiving IL-$4^{-/-}$ $CD4^+$ T cells demonstrate no difference in retinal ganglion cell number in the contralateral retinas compared to $Rag1^{-/-}$ mice receiving wild type T cells. Retinal ganglion cell counts (% of $Rag1^{-/-}$ mice injected with wild type T cells) of $Rag1^{-/-}$ mice injected with either wild type or IL-$4^{-/-}$ $CD4^+$ T cells 3 weeks before optic nerve injury. Retinal ganglion cell counts were assessed by Fluoro-Gold staining (n = 7, wild type; n = 7, IL-$4^{-/-}$ T cell injected; Student's t-test). (**G**) $MyD88^{-/-}$ mice exhibit no difference in retinal ganglion cell number in the contralateral retinas compared to wild type mice. Retinal ganglion cell counts (% of wild type) of wild type and $MyD88^{-/-}$ mice were assessed by Fluoro-Gold staining (n = 3, wild type; n = 3, $MyD88^{-/-}$; Student's t-test). (**H**) Mice receiving $MyD88^{-/-}$ bone marrow exhibit no difference in retinal ganglion cell number in the contralateral retinas compared to those receiving wild type bone marrow. Retinal ganglion cell counts (% of wild type ⇒ wild type) of wild type ⇒ wild type or $MyD88^{-/-}$ ⇒ wild type bone marrow chimeras. Bone marrow was allowed to engraft for 6 weeks before optic nerve injury, and retinal ganglion cell survival was assessed by Fluoro-Gold staining (n = 3, wild type bone marrow recipients; n = 3 $MyD88^{-/-}$ bone marrow recipients; Student's t-test).

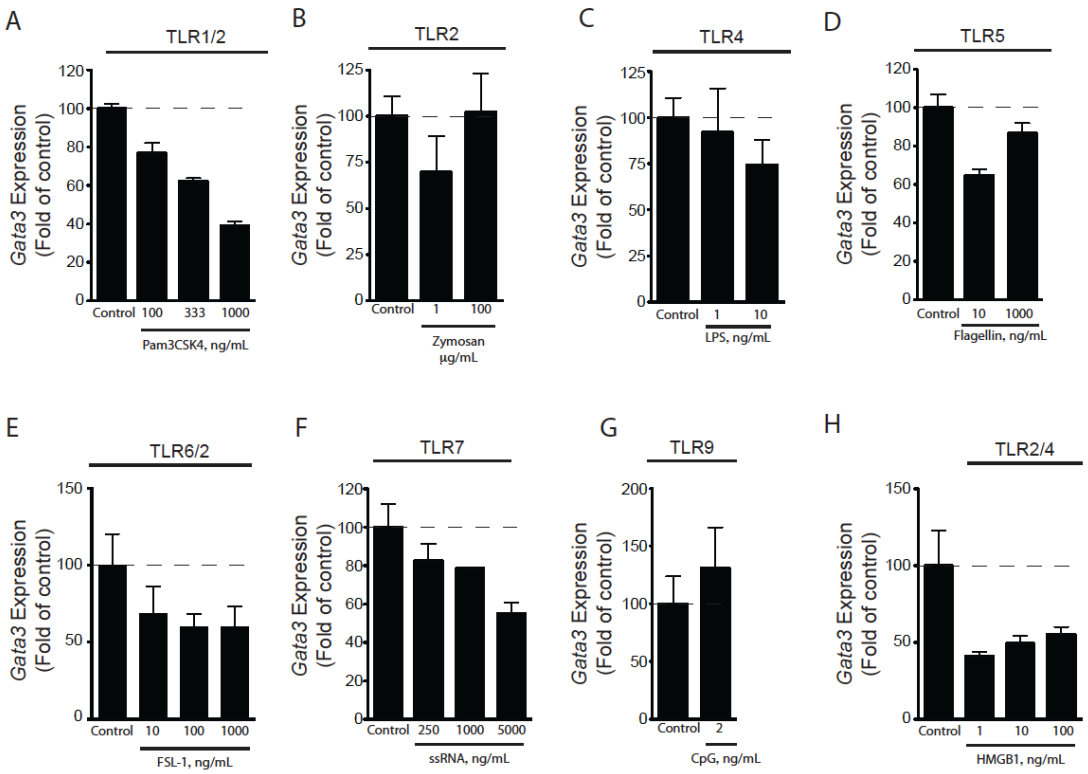

Figure S3: *Classical TLR ligands do not increase Gata3 mRNA expression in CD4$^+$ T cells. Gata3* expression (mean ± s.e.m.) in sorted wild type CD4$^+$ T cells co-cultured with Pam3CSK4 (**A**), zymosan (**B**), LPS (**C**), flagellin (**D**), FSL-1 (**E**), ssRNA (**F**), CpG (**G**), or HMGB1 (**H**) at the indicated concentrations for 3 days (n = 3 per group, representative of two experiments).

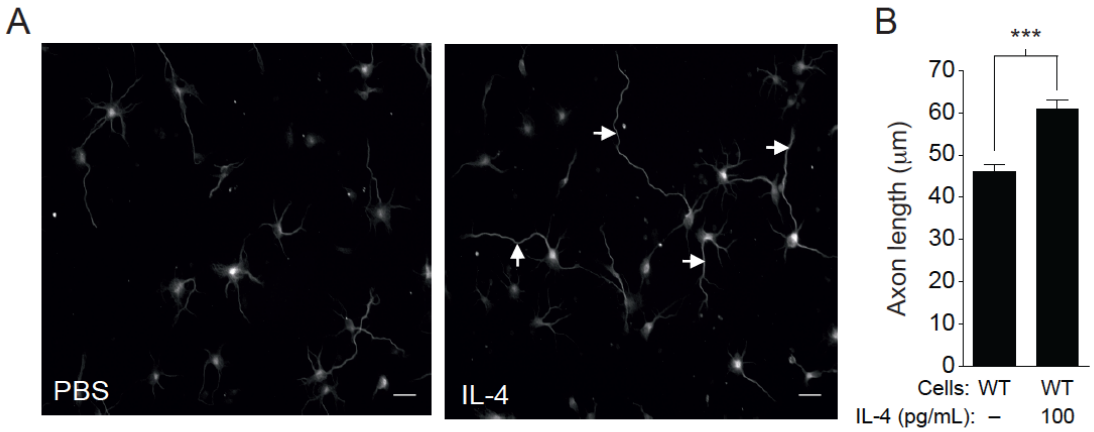

Figure S4*: IL-4 induces axon elongation in cultured neurons* (**A, B**) The application of a single dose of 100 pg/ml recombinant IL-4 significantly increased the length of axons (mean ± s.e.m.) of isolated primary neurons. Representative microphotographs (**A**) and quantification of axonal length (**B**) of isolated neurons treated with PBS or a single dose of 100 pg/ml recombinant IL-4. Scale bar: 20 µm. (n[well] = 4 per group. ***, $p < 0.001$; One-way ANOVA with Bonferroni's post-test).

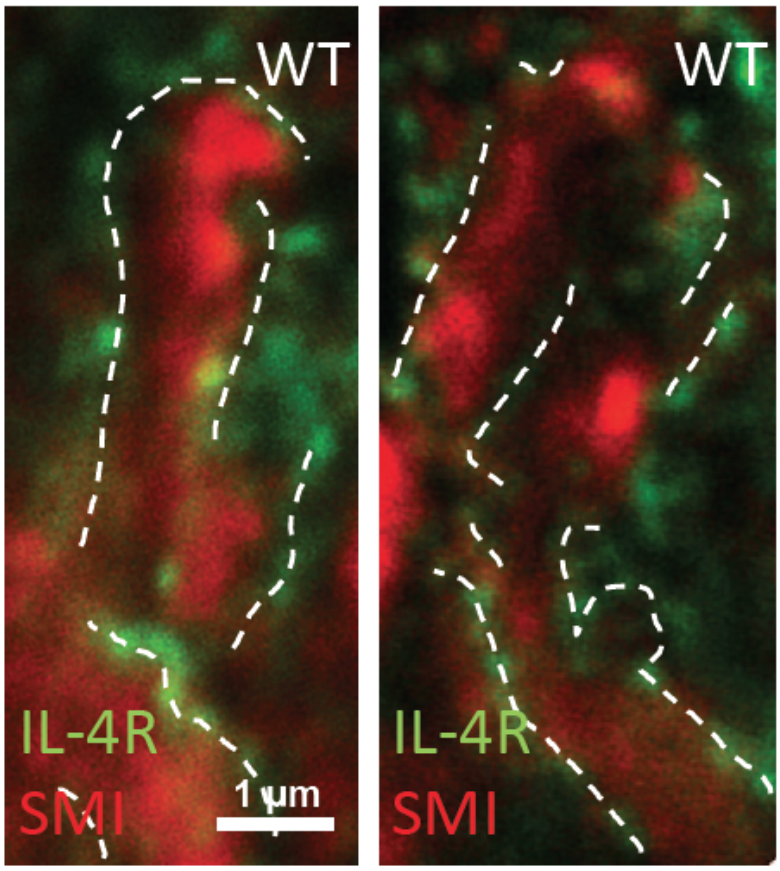

Figure S5: *IL-4R expression on spinal cord axons.* Axons in longitudinal sections of the spinal cord show tubular, membrane-related IL-4R expression (green) pattern, adjacent to the stained axonal neurofilament (SMI, red). The presumed membrane is indicated by dotted lines. Two representative axons (left and right panels) are provided. Scale bar: 1µm.

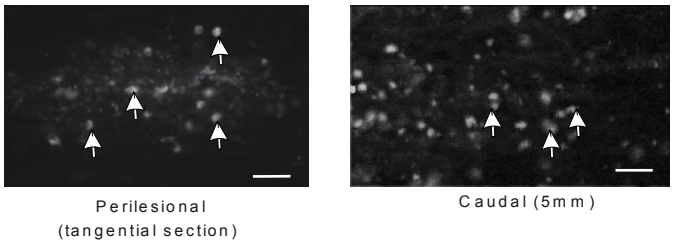

Figure S6: *T cells migrate caudally from the lesion site after injection.* $CFDA_{SE}$ labeled T cells were injected into the site of injury immediately after spinal cord injury. Spinal cords were isolated and visualized for $CFDA_{SE}$ labeled T cells 6 days after the lesion. (Scale bars: 15 μm). T cells were found at least 5 mm away from the site of injection, where axonal regrowth was observed.