F. BrdU^{+} cell population breakdown. EGFP^{+}CC1^{+} oligodendrocytes, EGFP^{neg}GFAP^{+} astrocytes and NG2^{+} cells comprise about half of all BrdU^{+} cells in the chronic animal.

Figure 6. *In vivo* treatment with glial growth factor 2 and basic fibroblast growth factor spinal cord injury results in increased numbers of EGFP^{+}CC1^{+} oligodendrocytes.

SCI Mice were injected subcutaneously with 0.02mg/kg FGF2 and 0.8mg/kg GGF2 for 8 days, beginning at 1 DPI, and sacrificed on day 9. NG2 immunoreactivity was increased in GGF2 + FGF2 mice (**A**), compared to saline-injected controls (**B**). EGFP^{+}CC1^{+} oligodendrocytes were also increased in GGF2 + FGF2 treated mice (**C**). **D.** Quantification of NG2^{+} cells indicating a significant increase in EGFP^{neg}NG2^{+} cells. **E.** Quantification of CC1^{+} cells indicating a significant increase in EGFP^{+}CC1^{+} oligodendrocytes; bars represent mean ± SEM. Two-way ANOVA was performed with Bonferrroni's post-hoc analysis.

SUPPLEMENTAL MATERIAL

Supplemental Figure 1. Histopathology and functional deficits after spinal cord injury in the CNP-EGFP mouse

A. Representative sections depicting eriochrome (myelin, blue), hemotoxylin (nuclei, purple) and eosin/phyloxine (cytoplasm, pink) stain showing an uninjured control spinal cord section (top) and sections from 1, 3, and 7 days post-injury (top to bottom, respectively), every 1mm from 2mm rostral to 2mm caudal. Scale bar = 500 μm.

B. Total Spared White Matter, measured as a percentage of the total cross-sectional area of the spinal cord at the epicenter, decreases with time after injury, and is significantly decreased at the injury epicenter as early as 1 day. Results represented as mean ± SEM. One-way ANOVA with Tukey's post-hoc analysis, * $p<0.05$; ** $p<0.01$ vs. Control. $p<0.05$; ŧ $p<0.01$ vs. 1 day, # $p<0.05$ vs. 3 days. N = 8 animals for all timepoints.

C. Hindlimb functional recovery after spinal cord injury. Animals exhibit significant hindlimb paralysis, slight movement at the ankle joint, no plantar placement (BMS score 1) at 1 day post-injury, and recover to weight supported plantar stepping with little coordination (BMS score 5-6) by 7 days. Continued recovery occurs with further significant increase at 35-42 days. Symbols represent mean ± SEM. N = 8 animals for acute timepoints, N = 6 for chronic timepoints. Two-way ANOVA with Bonferroni's post-hoc analysis was performed. * = $p<0.01$ vs. 1 day, # = $p<0.05$vs. 7 days.

D. CNP-EGFP cells (green) are distributed in both grey and white matter in uninjured control tissue. The white dotted line delineates grey matter. By 1 day at the injury epicenter, EGFP cells are visibly lost dorso-centrally. This loss continues at 7 days and is maintained at 42 days post-injury. GM = gray matter, WM = white matter. Sections are 10μm coronal sections from thoracic level 8 of CNP-EGFP transgenic mice. Scale bar = 250μm.

E. Upper panel: $CC1^+$ oligodendrocytes and $GFAP^+$ astrocytes (asterisks) in the uninjured ventral-lateral white matter. Inset shows a $GFAP^+$ cell neighboring a $CC1^+$ cell. $CC1^+$ cells are always $EGFP^+$. $GFAP^+$ cells are always $EGFP^-$. Scale bars = 10 μm. Lower panel: $EGFP^+CC1^+$ oligodendrocytes and $EGFP^-GFAP^+$ astrocytes (asterisks) at 1

day post-injury. After injury, $CC1^+$ cells are always $EGFP^+$ and $GFAP^+$ cells are always EGFP-. Scale bars = 10 µm.

F-G. Quantification of $DAPI^+$ nuclei, and of $EGFP^+CC1^+$ oligodendrocytes and $EGFP^{neg}GFAP^+$ astrocytes after SCI. Most oligodendrocyte and astrocyte loss occurs at the epicenter by 1 day after injury; loss at the epicenter is significant at all time points. Represented as Mean ± SEM. One-Way ANOVA. * = $p<0.05$, ** = $p<0.01$, *** = $p<0.001$ vs. Control. However, this loss is not reflected in the density of $DAPI^+$ nuclei. Black boxes in the ventral-lateral white matter indicate where cell counts were performed.

Supplemental Figure 2. Nestin and S100beta are expressed in subsets of $EGFP^+NG2^+$ cells in the spinal cord and after spinal cord injury.

A. Example of a nestin (blue)$^+$ $EGFP^+$ (green) $NG2^+$ (red) cell in the ventrolateral white matter in injured tissue at 3 DPI. Scale bar = 10µm.

B. Quantitative analysis for $EGFP^+NG2^+nestin^+$ cells in the control animal and in the injured animal at 1, 3 and 7 DPI, at 1.5mm rostral, epicenter, and 1.5mm caudal. Cell counts were performed in the ventral-lateral white matter. A side-by-side comparison for $EGFP^+NG2^+$ and $EGFP^+NG2^+nestin^+$ cells is shown for each timepoint. A subset of $EGFP^+NG2^+$ cells express nestin. Immunoreactive cells were quantified for 5 animals every 0.5 mm from the injury epicenter, and at the injury epicenter in the spared ventral-lateral white matter. For each distance at each timepoint, three 10 µm-thick sections were counted, left and right hemispheres, for a total of six fields per animal. Therefore, thirty

200 μm2 fields of view were quantified for each. One-Way ANOVA with Tukey's post-hoc analysis for variance. * $p<0.05$, ** $p<0.01$, *** $p<0.001$ vs. control.

C. Example of S100β$^+$ (blue) EGFP$^+$ (green) NG2$^+$ (red) cells in the ventrolateral white matter in injured tissue at 3 DPI. Scale bar = 10μm.

D. Quantitative analysis for EGFP$^+$NG2$^+$S100β$^+$ cells in the control animal and in the injured animal at 1, 3 and 7 DPI, at 1.5mm rostral, epicenter, and 1.5mm caudal. Cell counts were performed in the ventral-lateral white matter. A side-by-side comparison for EGFP$^+$NG2$^+$ and EGFP$^+$NG2$^+$S100β$^+$ cells is shown for each timepoint. A subset of EGFP$^+$NG2$^+$ cells express S100β. Immunoreactive cells were quantified for 5 animals every 0.5 mm from the injury epicenter, and at the injury epicenter in the spared ventral-lateral white matter. For each distance at each timepoint, three 10 μm-thick sections were counted, left and right hemispheres, for a total of six fields per animal. Therefore, thirty 200 μm2 fields of view were quantified for each. One-Way ANOVA with Tukey's post-hoc analysis for variance. * $p<0.05$, ** $p<0.01$, *** $p<0.001$ vs. control.

Supplemental Figure 3. Olig2, Sox10 and Sox17 expression in EGFP$^+$NG2$^+$ cells is altered after spinal cord injury.

A. Examples of EGFP$^+$NG2$^+$ cells (blue) expressing Olig2 (red) in acutely injured (top panels) and chronically injured (bottom panels) white matter. DAPI (white) labels nuclei. Scale bar = 10μm.

B-C. Cell counts of EGFP$^+$NG2$^+$Olig2$^+$ cells in acutely injured (**B**; 1, 3 and 7 DPI) and chronically injured (**C**; 6 weeks DPI) at 1.5mm rostral, at the injury epicenter, and at

1.5mm caudal. Cell counts were performed as described above. One-Way ANOVA with Tukey's post-hoc test for variance. * $p < 0.05$; ** $p < 0.01$ vs. control.

D. Examples of $EGFP^+NG2^+$ cells (blue) expressing Sox10 (red, top panels) and Sox17 (red, bottom panels) in acutely injured animals. DAPI (white) labels nuclei. Scale bar = 10μm.

E-F. Cell counts of $Sox10^+EGFP^+NG2^+$ (**E**) and $Sox17^+EGFP^+NG2^+$ (**F**) cells in acutely injured (1, 3 and 7 DPI) at 1.5mm rostral, at the injury epicenter, and at 1.5mm caudal. Cell counts were performed as described above. One-Way ANOVA with Tukey's post-hoc test for variance. * $p < 0.05$; ** $p < 0.01$ vs. control; *** $p < 0.001$.