Supplemental Data Figure Legends

Figure S1

Schematic of Four Quantitative Methods to Assess Neurite Outgrowth

An embryonic dorsal root ganglion (DRG) explant is labeled with anti-neurofilament antibody, imaged and montaged in its entirety. (A) Skeletonization: The neuronal soma are excluded from analysis and the remaining neurite carpet is processed to skeletonize the image to one pixel width. Total pixels are counted as a measure of total outgrowth. (B) Average Neurite Carpet Radius: A user-defined crosshair specifies the centre of explant and a polygon shape is used to specify the edge of the neurite carpet. The average radius from the explant centre to the polygon is assessed by morphometric analysis. The same analysis is performed outside the neuronal soma and the resulting radii are subtracted to determine average neurite carpet radius. (C) Neurite Carpet Surface Area: The entire DRG explant is selected and the neuronal soma are excluded from analysis. The surface area of the selected region is measured in pixels and converted to m^2. (D) Total Neurite Carpet Signal: The entire DRG explant is selected and the neuronal soma are excluded from analysis. The signal within the selected region is measured in pixels.

Figure S2: Reverse-Transcriptase PCR Analysis of SPARC Expression

RNA was generated from P2 and P6 LP-OECs, as well as postnatal day 5 olfactory epithelium (OE), the source tissue from which the LP-OECs were cultured. A cDNA library was made from the RNA samples using a poly d-T primer. PCR primers for SPARC were used on the libraries to confirm SPARC expression in the samples.

Figure S3: Comparison of Average Neurite Radius Between Wild Type and SPARC Null Conditioned Media

rhSPARC, passage 2 wild type and passage 2 SPARC KO conditioned media increase the average length of neurites over the NGF baseline control. There is no statistical significance between wild type and null conditioned media groups. Asterisks: * is $p < 0.05$; * is $p < 0.005$; *** is $p < 0.0005$; ns= not statistically significant.

Figure S4: Repair Responses in the WT and SPARC Null Transplanted Lesioned Spinal Cord

28 days after transplantation of GFP-positive LP OECs from (A, B, C, G) WT or (D, E, F, H) SPARC null mice into a dorsolateral funiculus lesion, no differences were recorded in the overall intensity of (A, D) neuron specific tubulin- (NST; □III-tubulin) or (B, E) neurofilament (NF)- positive fibers (red) sprouting into the lesion site (demarcated by GFAP-positive immunoreactivity, blue). Infiltration of endogenous p75-expressing Schwann cells (p75 rat specific, red) was also similar within the lesion site of (C) WT or (F) SPARC null OEC transplanted animals. (G, H) RECA-positive blood vessels (red) grew to a similar extent and direction toward the site of (G) WT and (H) SPARC null transplanted OECs, and laminin was also deposited (blue) at the PNS-CNS interface of the lesion site. Scale bars all 100□m.

Figure S5: Schwann Cell Migration is Decreased in the Presence of SPARC.

Over 24 hours, Schwann cells plated onto the top of a laminin-coated Boyden chamber in the presence of 5ng/mL recombinant human SPARC, 1% FBS, and DMEM showed a 7.7

fold decrease in migration to the underside of the Boyden chamber, when compared with untreated (1% FBS, DMEM) Schwann cells ($p \leq 0.001$). Migration is expressed as a percentage of the number of cells on the underside of the membrane over the total number of cells on the membrane.

Figure S6: Schematic of Generating Conditioned Media Samples from Passage 2 and Passage 6 LP-OECs: Over the course of passage and purification, LP-OECs were weaned off serum by gradual step-down and increasing plating density. Purified LP-OECs are grown in serum-free media for 5 days before harvesting conditioned media at either passage 2 or passage 6. Media was then concentrated to 10-30-fold using an ultrafiltration cell with a 1 KDa molecular weight cut off (MWCO) filter. To fairly cross-compare early and late passage media, all OCM samples were normalized to the number of cells generating a given volume of media.