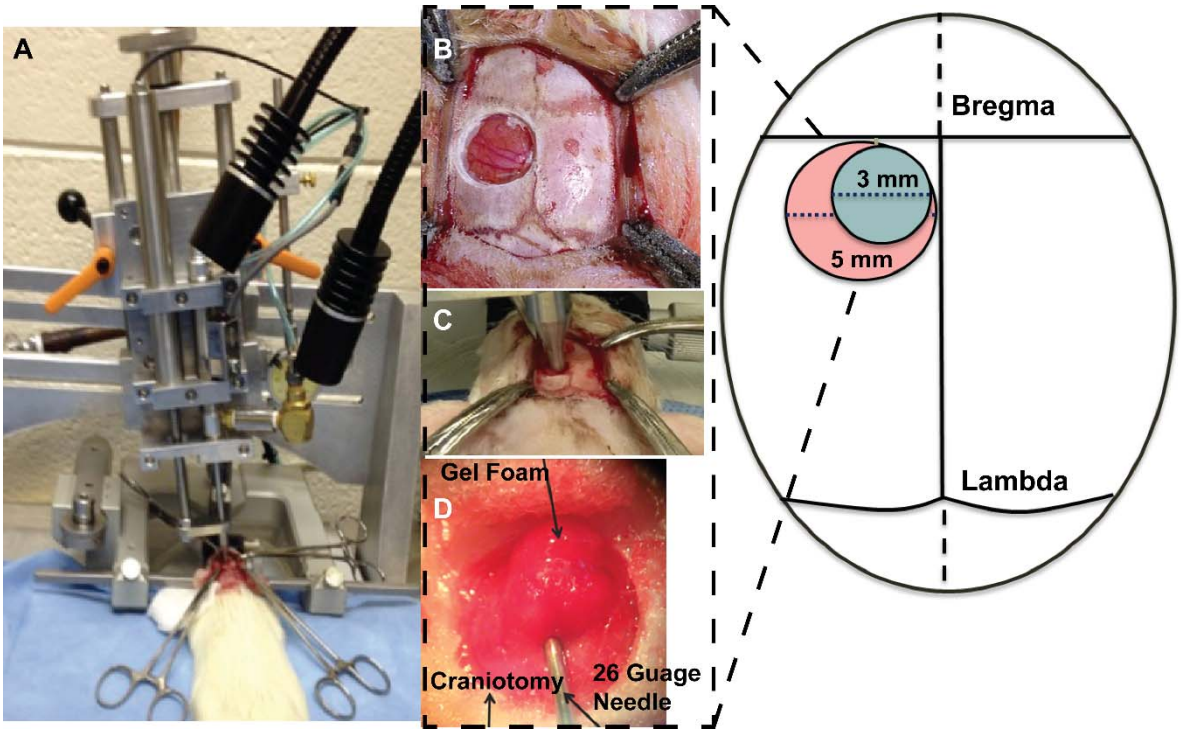

Figure S1: Location of Controlled Cortical Impact (CCI) injury of the rat motor cortex. (A) CCI positioned to deliver a TBI to a stereotactically immobilized rat; (B) A 5 mm diameter craniotomy created at 0.5 mm anterior to bregma, and 0.5mm lateral from the sagittal suture; (C) A 3 mm diameter impactor positioned inside the 5 mm diameter craniotomy was driven at a speed of 2.25 m/s and a dwell time of 250 ms to deliver a CCI injury to the cortex; (D) 48 h post-TBI, allogeneic rat NSCs, CS-GAG matrices, or CS-GAG matrix encapsulated NSCs were delivered in a 25 µl volume using a 26 gauge needle, and a syringe pump programmed to deliver the contents of the Hamilton syringe at a rate of 2 µl/min while the surface of the cortex was kept moist with a saline soaked piece of gel foam.

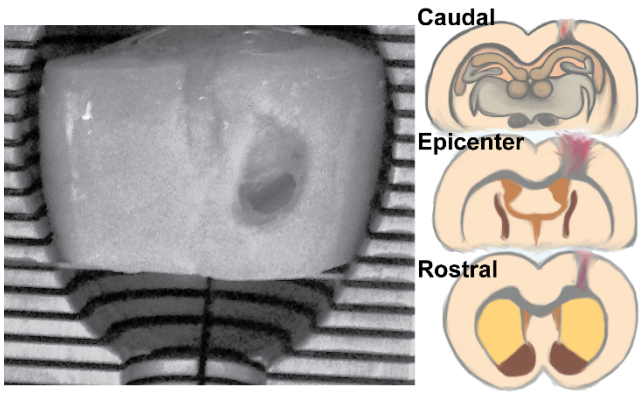

Figure S2: Schematic describing tissue acquisition strategy for immunohistochemical staining. Brain tissue extracted from TBI impacted rats were trimmed rostrally and caudally using a rat brain matrix. The trimmed brain tissue section containing the region of focal impact was subsequently processed for cryosectioning. 10 slides in total (5 from rostral end, and 5 from caudal end) were collected per animal. Each slide contained three 15 μm sections that were serially collected from the rostral and the caudal sides of the injury.

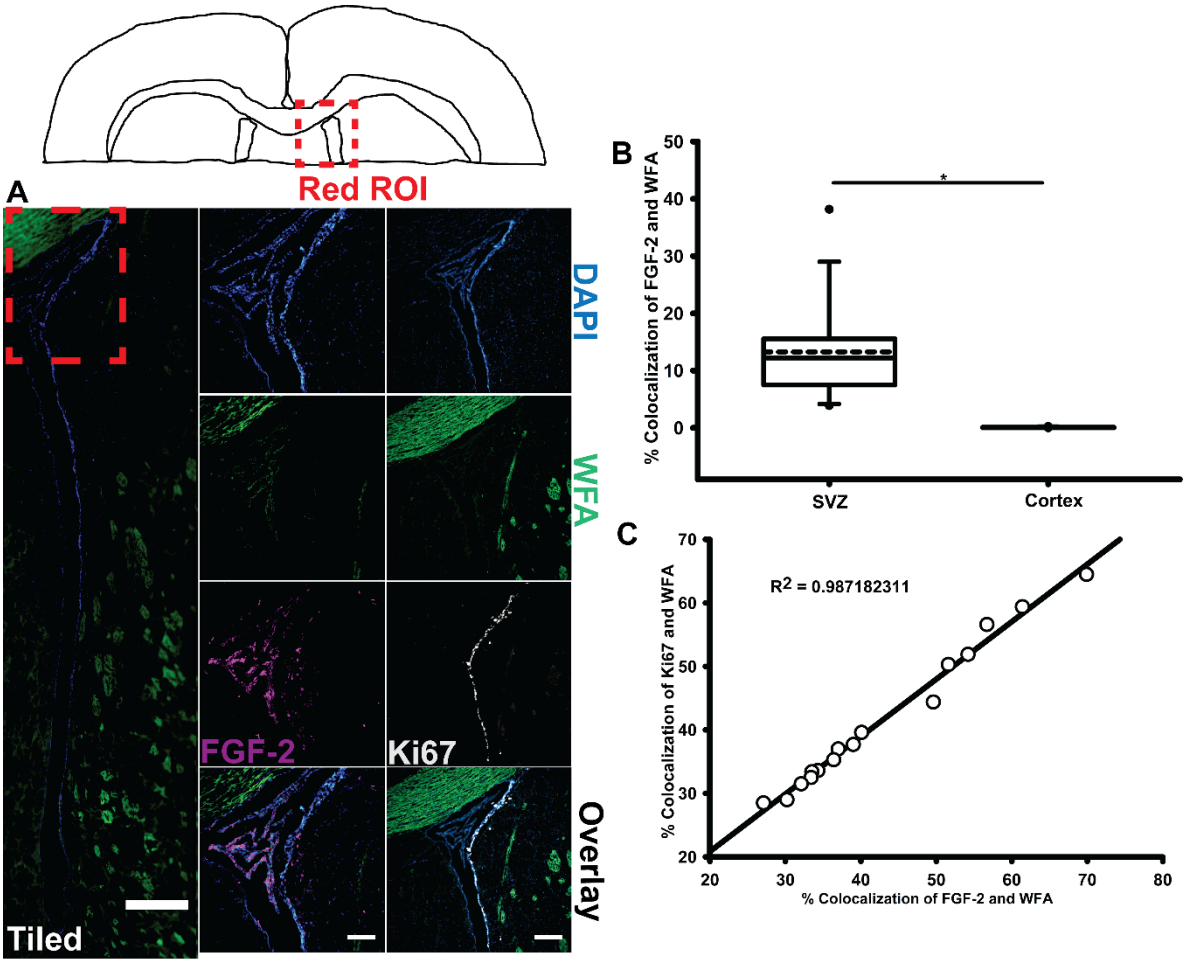

Figure S3: Coronal rat brain section demonstrating the colocalization of CS-GAGs, FGF-2 and Ki67+ proliferating cells in the rat subventricular zone (SVZ). (A) Representative images of the region corresponding to the red dotted region of interest (ROI) surrounding a portion of the SVZ in coronal brain sections. A tiled representation of the lateral ventricle is presented on the left of figure panel (A); Scale = 300 μm. Cellular nuclei are represented by DAPI (blue); CS-GAG and GalNAc presence in the corpus callosum and in the SVZ is indicated by WFA labeling (green); FGF-2 labeling is indicated in magenta; Proliferating Ki67+ cells are represented in grayscale; Merged overlays are presented in the bottom most panel;

Scale = 100 μm. Significantly greater colocalization of FGF-2 and WFA was observed in the SVZ when compared to the cortex (B); and there was a high correlation of Ki67+ cells and WFA % colocalization with FGF-2 and WFA % colocalization (C). Statistical significance is represented by '*' which indicates $p<0.05$.

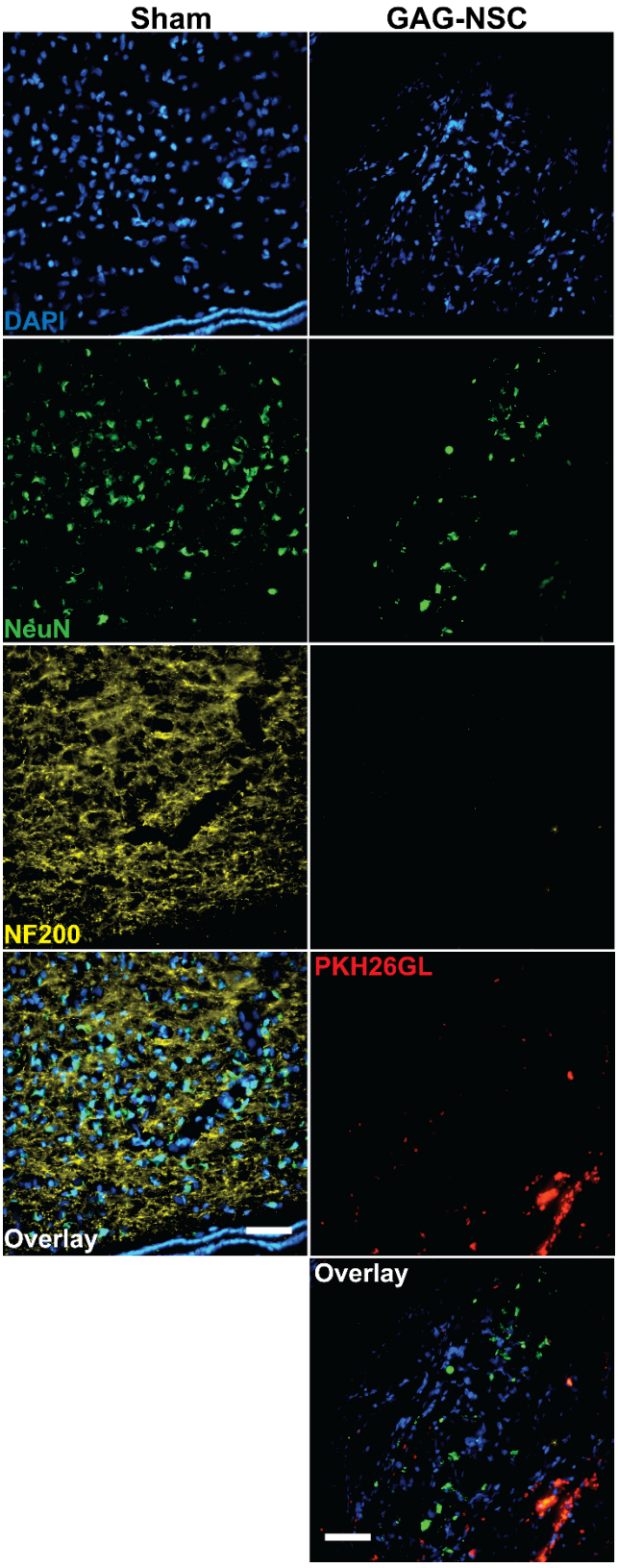
Sham
GAG-NSC
DAPI
NeuN
NF200
Overlay
PKH26GL
Overlay

Figure S4: High magnification images demonstrating the presence of differentiated neurons lacking neurofilament expression in brain tissue obtained from GAG-NSC treated animals four weeks post-TBI. Representative images of cells in the lesion epicenter in GAG-NSC treated animals, and in the corresponding location in sham treated animals. Cellular nuclei are represented by DAPI (blue); Neurons are marked by NeuN (green); neurofilaments in mature neurons are marked by NF200 (yellow); transplanted NSCs in CS-GAG matrix are marked by the cell-membrane dye PKH26GL (red); Merged overlays are presented in the bottom most panels; Scale = 50 μm. $NeuN^{+ve}$ cells observed in GAG-NSC treated animals did not show any expression of NF200 staining to the extent observed in sham treated animals, suggesting that these cells had not yet differentiated into mature neurons.