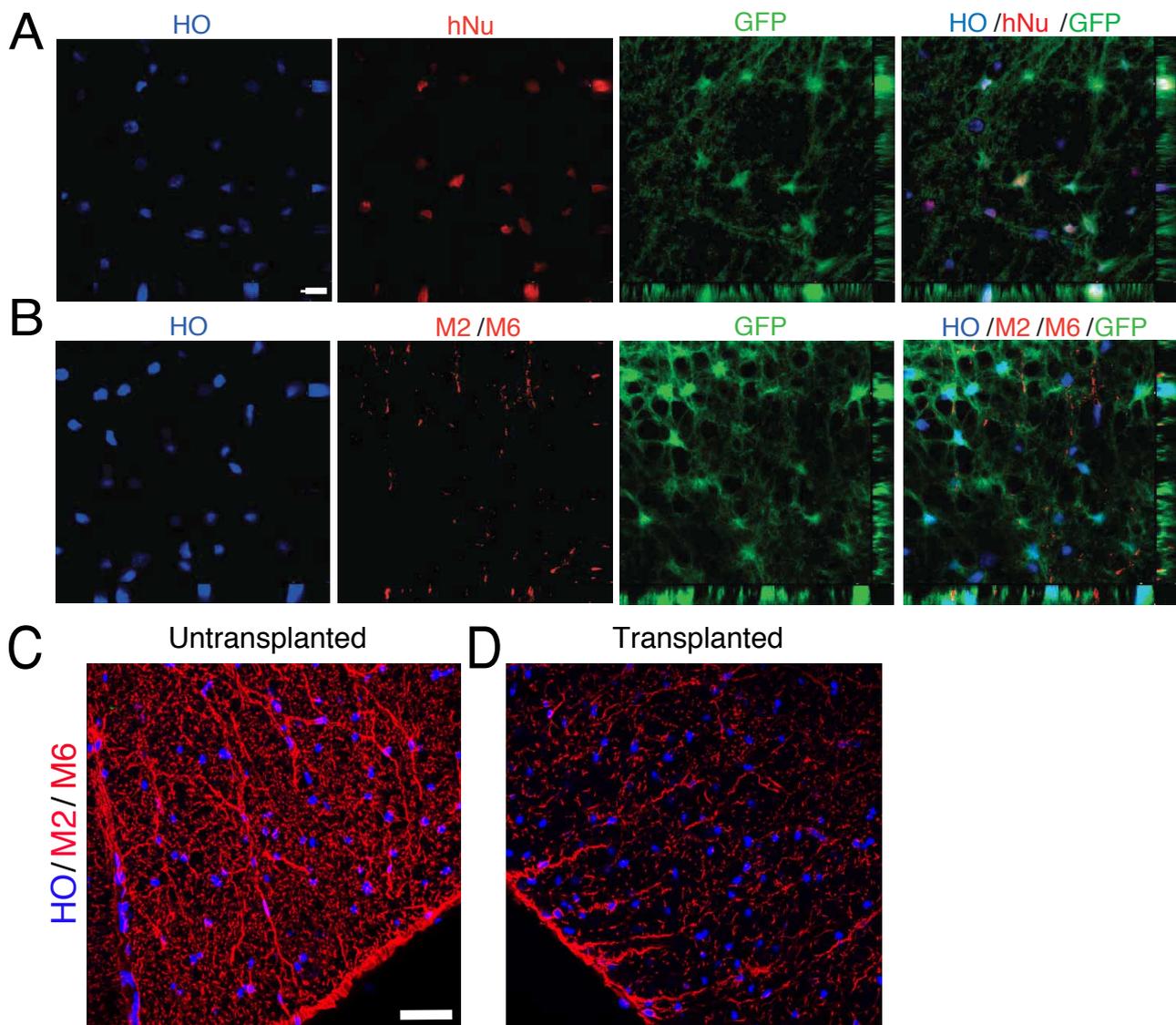


**Supplemental Figure 1.**

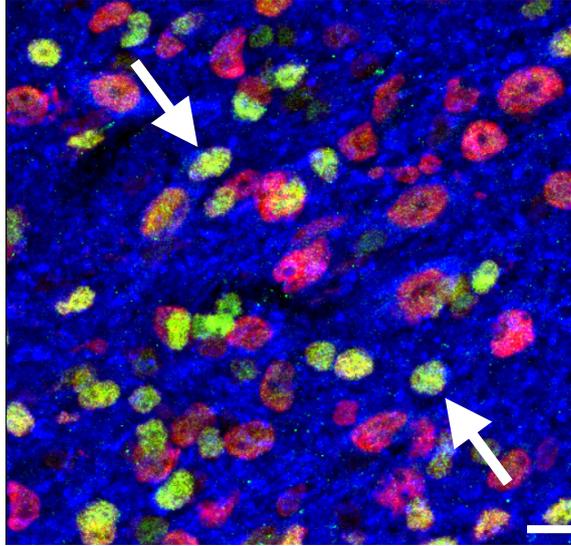
(A) Three months post-grafts, GFP was downregulated in human neuron ( $\text{hNu}^+/\text{NeuN}^+$ ). (B) Two weeks post-graft, none of cells in the graft (G) were positive for GFAP or hGFAP. (C) Two weeks post-graft, some of the  $\text{hNu}^+$  cells (from iPSCs) were positive for MAP2. (D) Three months post-graft, human astrocytes ( $\text{hGFAP}^+/\text{GFP}^+$ ) were mostly localized to the edge of the graft bordering the white matter. (E) Three months post-graft, small numbers of  $\text{hNu}^+$  cells were  $\text{olig2}^+$ . (F) Five months post-graft, some of the  $\text{hNu}^+$  cells became  $\text{NG2}^+$ . Scale bar =  $50\mu\text{m}$ .



**Supplemental Figure 2.**

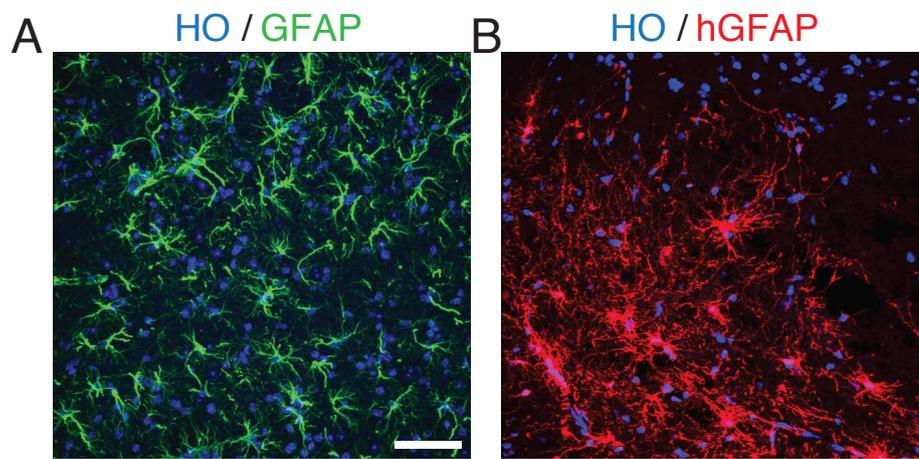
(A) Confocal analysis indicated that human (GFP+) cell did not contain additional nuclei besides the hNu+ nucleus. Scale bar =  $10\mu\text{m}$ . (B) Confocal analysis showed that human (GFP+) cells were not positive for the mouse-specific antibody M2/M6. Scale bar =  $10\mu\text{m}$ . In the un-transplanted side (C), the M2/M6 fluorescent signal was substantially higher than that in the transplanted sides (D) at 9 months. Scale bar =  $10\mu\text{m}$ .

**A** hNu/Casp3/B-tublin



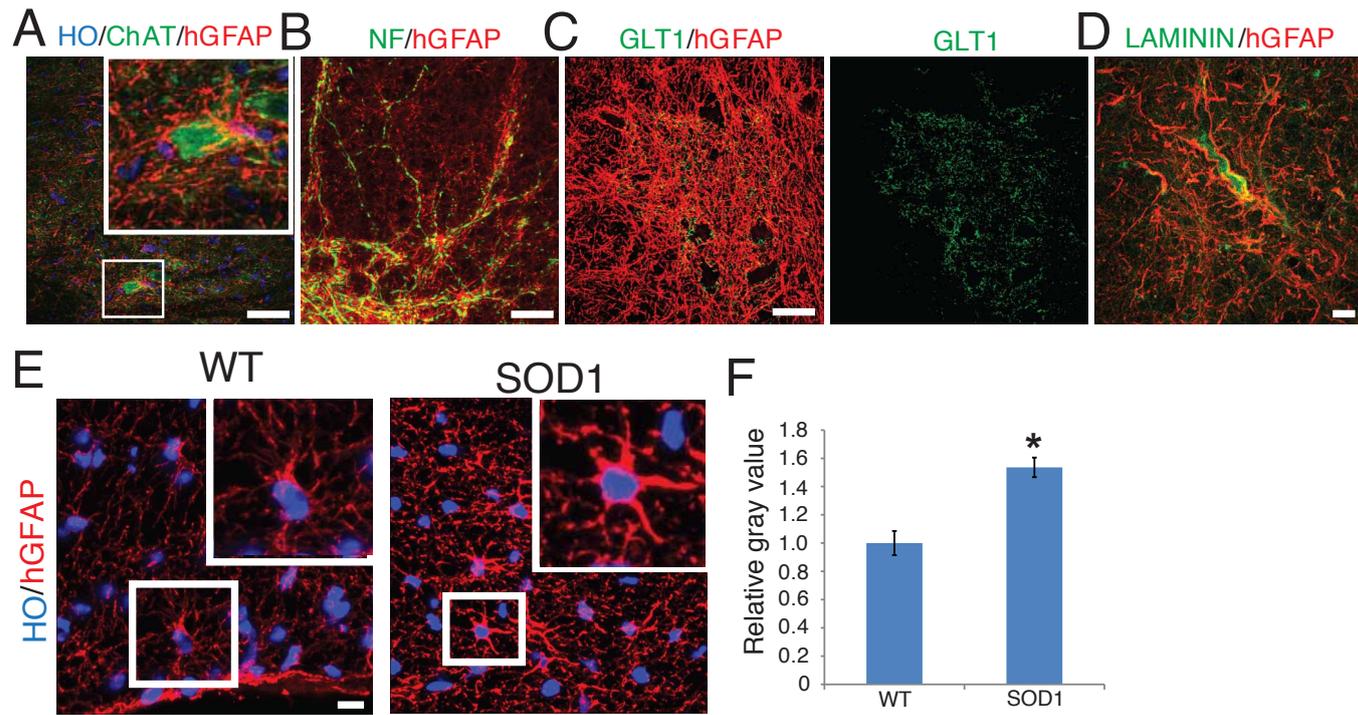
**Supplemental Figure 3**

The  $\beta$ III-tubulin+ human (hNu+) neurons expressed caspase-3 at 5 months. Scale bar = 10 $\mu$ m.



**Supplemental Figure 4**

Morphology of mouse astrocytes in untransplanted areas labeled by a pan-GFAP antibody (A) and human astrocytes stained with a human specific GFAP antibody (B). Scale bar=50 $\mu$ m.



#### Supplemental Figure 5

ALS astrocytes structurally integrate into the host tissue. (A) In gray matter, the hGFAP<sup>+</sup> astrocytes (from ALS iPSCs) surround neurons, including ChAT<sup>+</sup> motor neurons (inset). Scale bar = 50 $\mu$ m. (B) In the white matter, the human astrocytes (from ALS iPSCs) extend long processes that line up with the NF<sup>+</sup> axons. Scale bar = 50 $\mu$ m. (C) The intensity of GLT1 staining is higher in the gray matter than in the white matter. Scale bar = 50 $\mu$ m. (D) Human astrocytes (hGFAP<sup>+</sup>) project end feet to the blood vessel. Scale bar = 10 $\mu$ m. (E) Human astrocytes show activated morphology in SOD1 transplanted group. Scale bar=10 $\mu$ m. (F) Relative intensity of human specific GFAP (mean  $\pm$  SEM) is higher in ALS cell-transplanted group than wt group, Significance was assessed by *t* test (n=6, \**P*<0.05).

**Supplemental Table 1. Antibodies (Zhang)**

<b>Antibody</b>	<b>Isotype</b>	<b>Dilution</b>	<b>Source</b>	<b>Catalog No</b>
AQP4	Rabbit IgG	1:500	Chemicon & Millipore	AB3594
Capase3	Rabbit IgG	1:500	Cell Signaling Technology	9661
ChAT	Goat IgG	1:300	Chemicon & Millipore	AB5964
CX43	Rabbit IgG	1:200	ZYMED	48-3000
GFAP	Rabbit IgG	1:5,000	DAKO	Z0034
GLT1	Guinean pig IgG	1:25000	Gift from Dr. Jeff Rothstein	
Human Nuclei	Mouse IgG	1:200	Chemicon & Millipore	MAB1281
Ki67	Rabbit IgG	1:500	ZYMED	18-0191
hGFAP	Mouse IgG	1:500	Stem Cells, Inc	AB-123-U-050
Neurofilament 200	Rabbit IgG	1:1000	Sigma	N4142
Tubulin	Rabbit IgG	1:4,000	Chemicon & Millipore	AB9354
M2	Mouse IgG2a	1:100	DSHB, Iowa City, IA	<a href="http://dshb.biology.uiowa.edu/M2-membrane-protein">http://dshb.biology.uiowa.edu/M2-membrane-protein</a>
M6	Mouse IgG2a	1:100	DSHB, Iowa City, IA	<a href="http://dshb.biology.uiowa.edu/M6-membrane-protein">http://dshb.biology.uiowa.edu/M6-membrane-protein</a>
MAP2	Rabbit IgG	1:5000	Chemicon & Millipore	AB5622
NeuN	Rabbit IgG	1:500	Chemicon & Millipore	ABN78
NG2	Rabbit IgG	1:500	Chemicon & Millipore	AB5320
OLIG2	Rabbit IgG	1:500	Chemicon & Millipore	AB9610