Supporting Information

Fabrication of Hemin-Doped Serum Albumin-Based Fibrous Scaffolds for Neural Tissue Engineering Applications

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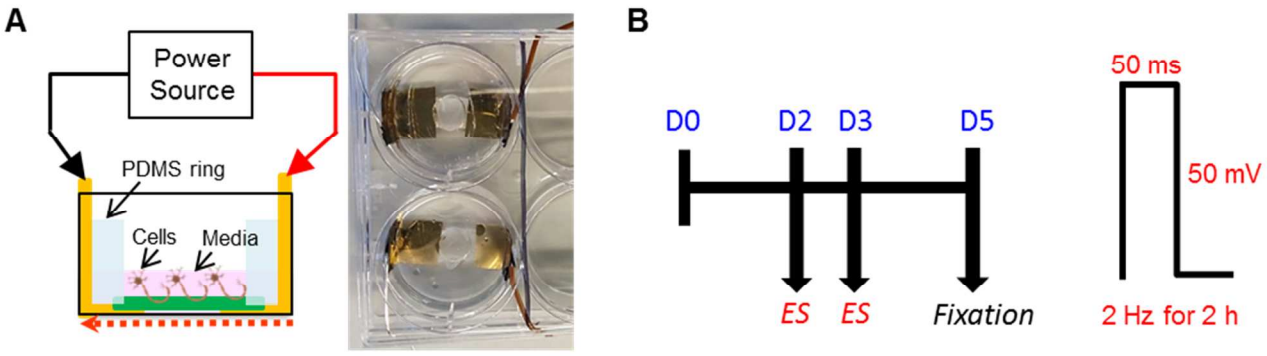

Figure S1. Electrical stimulation (ES) setup and stimulation waveform. (A) Schematic of cell culture constructs for electrical stimulation studies (left) and photograph of the cell culture constructs for electrical stimulation (right). (B) The experimental scheme (left) and the stimulation waveform (right) (D represents days).

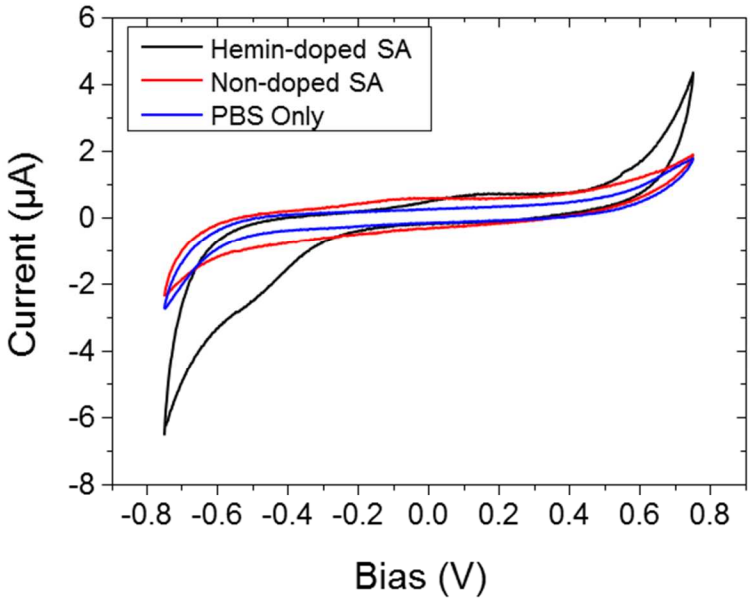

Figure S2. Conductivity of PBS, non-doped, and hemin-doped SA fibrous scaffolds measured with cyclic voltammetry at a scan rate of 40 mV/s. The measurements were conducted in PBS buffer using two electrodes as in Figure S1. The application of DC bias induced ionic conduction across the aqueous solution with similar currents for the non-doped SA sample and for the PBS only control. Placing the hemin-doped SA scaffold resulted in elevated currents and clear

oxidation and reduction peaks. The elevated current implies the enhanced conduction across the doped SA scaffold, while the redox peaks suggest hemin-associated redox next to the electrode surface.

	FGF Incorporated Mats	Medium	Percentage of $Ki67^+$ Cells (%)	SEM (%)
Non-doped SA	X	Basal	17.86	3.22
	X	FGF	31.48	3.79
	FGF Mats	Basal	33.75	2.52
	FGF Mats	FGF	36.36	3.49
Hemin-doped SA	X	Basal	10.86	2.87
	X	FGF	19.48	4.10
	FGF Mats	Basal	21.12	1.20
	FGF Mats	FGF	14.82	2.81

Table S1. Cell proliferation of the hiPSC-derived NSCs examined with the percentage of $Ki67^+$ cells (X represents the non-incorporated mats; SEM represents standard error of the mean).

	FGF Incorporated Mats	Medium	Percentage of βIII-Tubulin$^+$ Cells (%)	SEM (%)
Non-doped SA	X	Basal	26.38	1.76
	X	FGF	16.71	2.84
	FGF Mats	Basal	13.00	2.26
	FGF Mats	FGF	15.61	2.08
Hemin-doped SA	X	Basal	38.88	7.34
	X	FGF	17.01	5.18
	FGF Mats	Basal	30.10	5.52
	FGF Mats	FGF	27.98	7.42

Table S2. Neuronal differentiation of the hiPSC-derived NSCs examined with the percentage of βIII-tubulin$^+$ cells (X represents the non-incorporated mats; SEM represents standard error of the mean).

	Electrical Stimulation	Neurite Outgrowth (μm)	SEM (μm)	Neurite Branching	SEM
Glass	X	57.95	3.44	2.43	0.17
	Stimulated	65.74	7.76	2.60	0.30
Hemin-doped SA	X	69.47	3.82	2.92	0.15
	Stimulated	78.14	6.40	3.76	0.12

Table S3. The effects of electrical stimulation on neurite outgrowth and neurite branching (X represents the unstimulated groups; SEM represents standard error of the mean).