Electronic Supporting Information (ESI)

Dual-enzymatically cross-linked gelatin hydrogel enhances neural differentiation of human umbilical cord mesenchymal stem cells and functional recovery in experimental murine spinal cord injury

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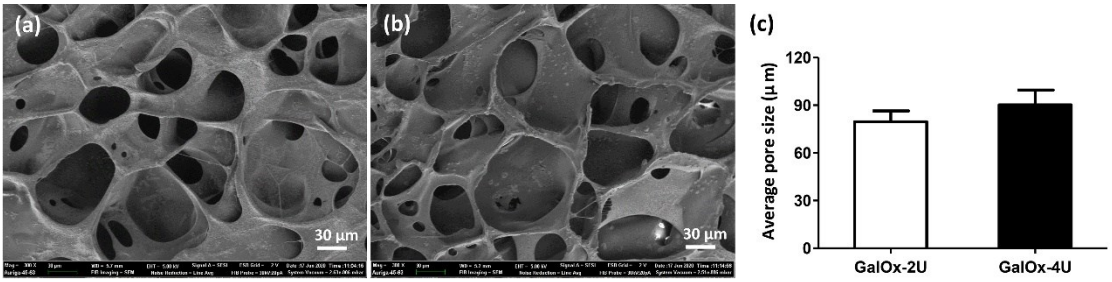

Figure S1 Internal microtopography of GH hydrogels under scanning electron microscope and average pore size. GalOx-2U hydrogel (a), GalOx-4U hydrogel (b), average pore size of GalOx-2U and GalOx-4U hydrogels (c).

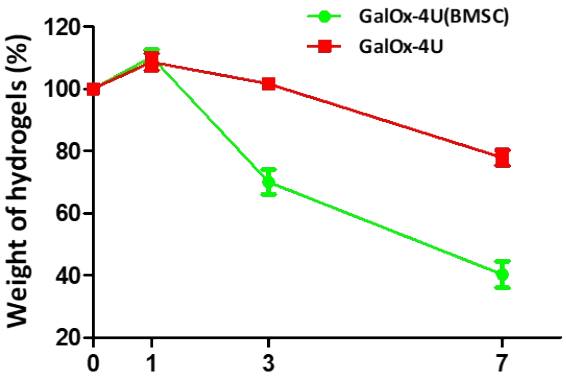

Figure S2 The degradation of hUC-MSCs-loaded GalOx-4U hydrogel and cell-free GalOx-4U hydrogel on day 1, 3, and 7.

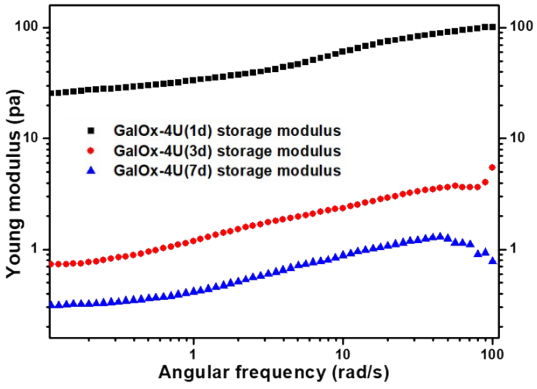

Figure S3 Storage modulus of GalOx-4U hydrogels 1, 3, and 7 days after the fabrication measured by rheometer.

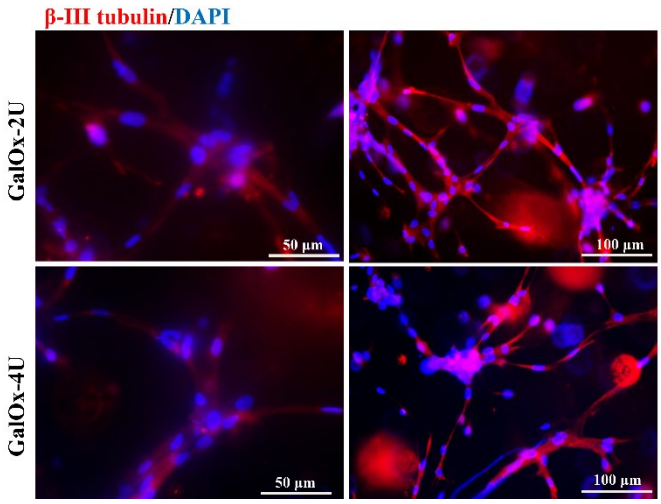

Figure S4 Images of hUC-MSCs cultivation within GalOx-2U and GalOx-4U hydrogels by β-III tubulin immunofluorescent staining on day 3 (Enlarged images).

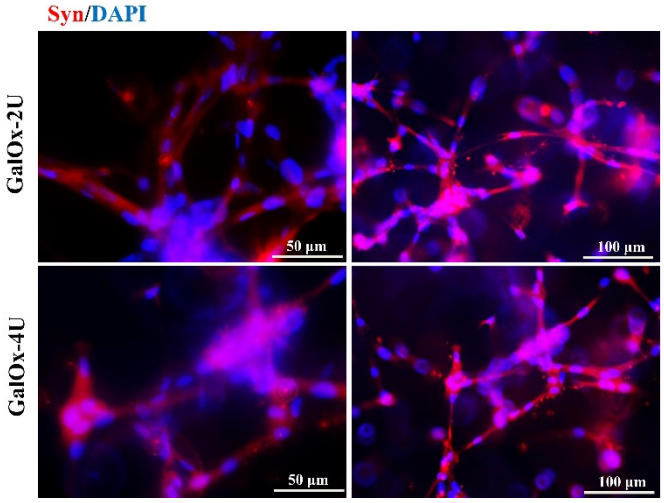

Figure S5 Images of hUC-MSCs cultivation within GalOx-2U and GalOx-4U hydrogels by synapsin-1 immunofluorescent staining on day 5 (Enlarged images).

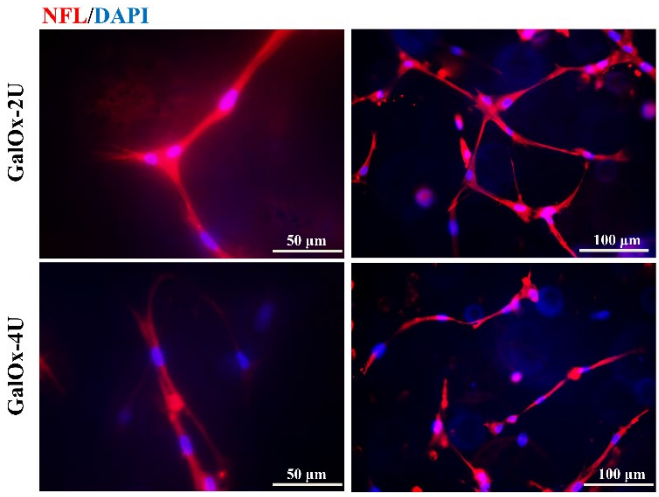

Figure S6 Images of hUC-MSCs cultivation within GalOx-2U and GalOx-4U hydrogels by NFL immunofluorescent staining on day 7 (Enlarged images).

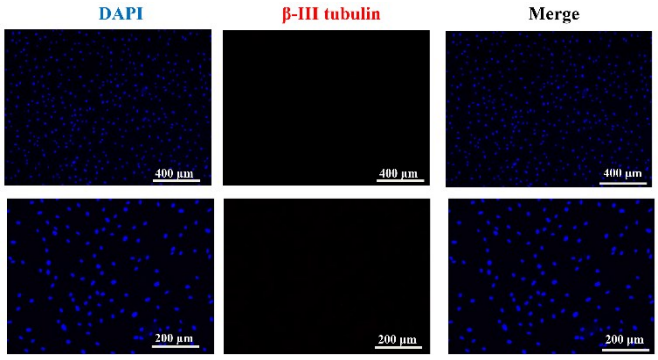

Figure S7 β-III tubulin immunostaining of hUC-MSCs after the cultivation on cell culture plate for 3 days before encapsulated in hydrogel.

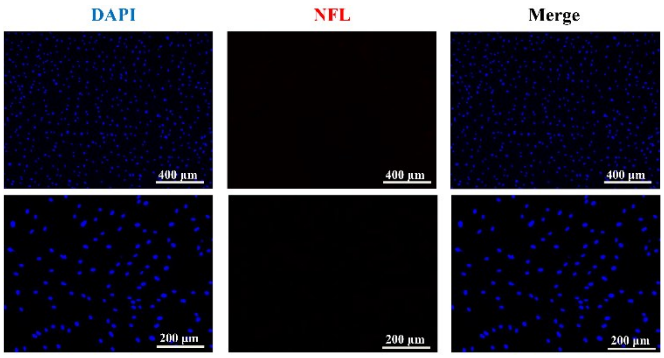

Figure S8 NFL immunostaining of hUC-MSCs after the cultivation on cell culture plate for 3 days before encapsulated in hydrogel.

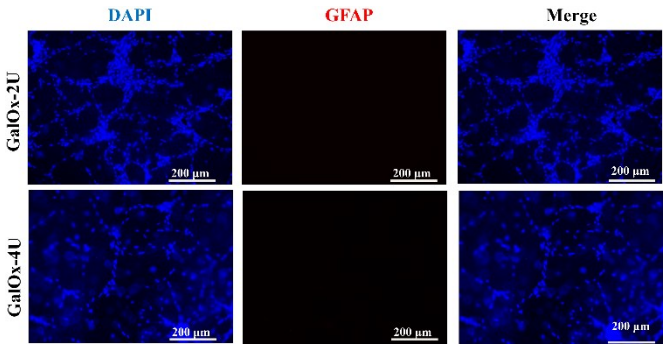

Figure S9 GFAP immunostaining of hUC-MSCs within GalOx-2U and GalOx-4U hydrogels on day 3.

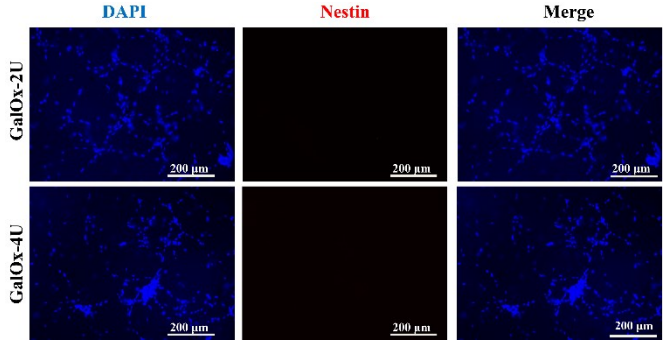

Figure S10 Nestin immunostaining of hUC-MSCs within GalOx-2U and GalOx-4U hydrogels on day 3.

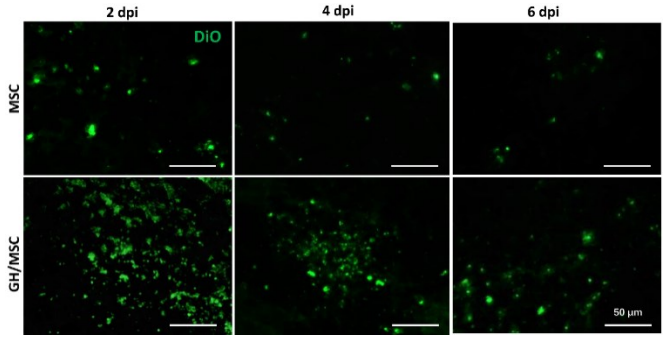

Figure S11 Images of DiO-labeled hUC-MSC in the damaged spinal cords on 2, 4, and 6 dpi of GH/MSC group and MSC group for analyzing cellular retention.

Table S1 Wet weight, dry weight, and water content of spinal cords in Normal, NS, GH, MSC, and GH/MSC groups.

	Normal			**NS**			**GH**			**MSC**			**GH/MSC**		
wet weight (mg)	37.0	37.2	36.7	26.4	40.0	34.1	33.2	35.7	36.2	31.0	33.9	33.3	42.6	31.7	32.6
dry weight (mg)	10.7	12.0	11.3	3.9	5.7	3.5	7.3	6.6	6.3	6.2	7.3	7.8	11.6	10.9	9.6
water content (%)	71.1	67.7	69.2	85.2	85.8	89.7	78.0	81.5	82.6	80.0	78.5	76.6	72.8	65.6	70.6
Mean±SD (%)	69.3 ± 1.7			86.9 ± 2.5			80.7 ± 2.4			78.4 ± 1.7			69.7 ± 3.7		