

Supplemental Information

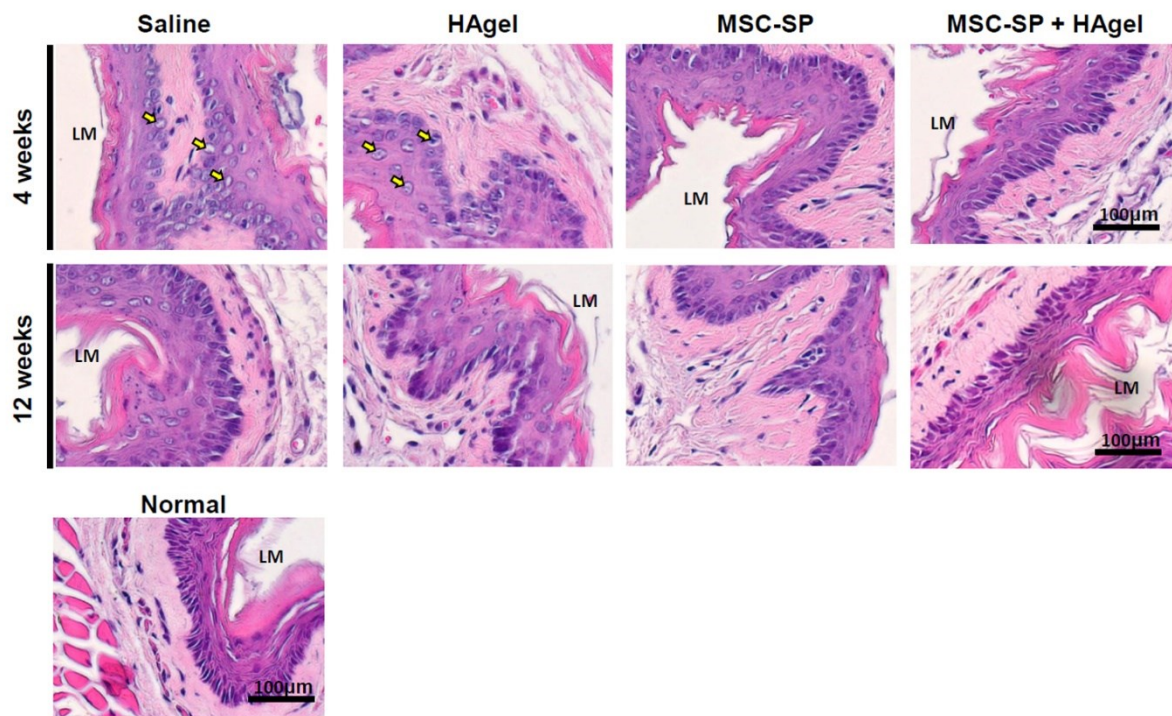
Regeneration of irradiation-damaged esophagus by local delivery of mesenchymal stem-cell spheroids encapsulated in a hyaluronic-acid-based hydrogel

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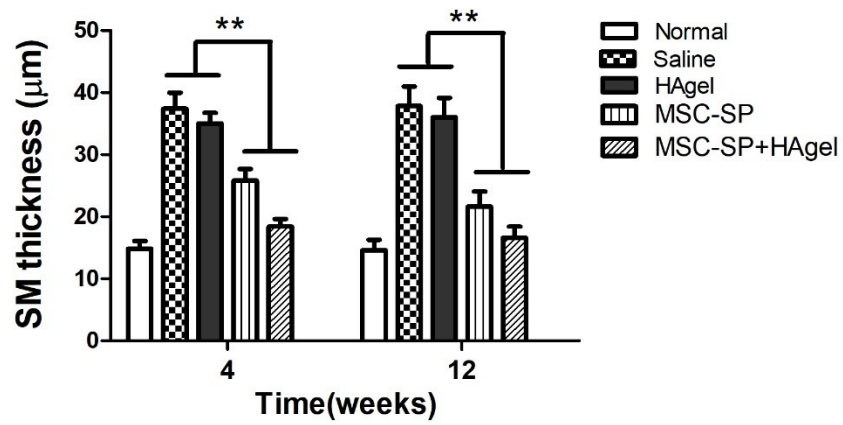
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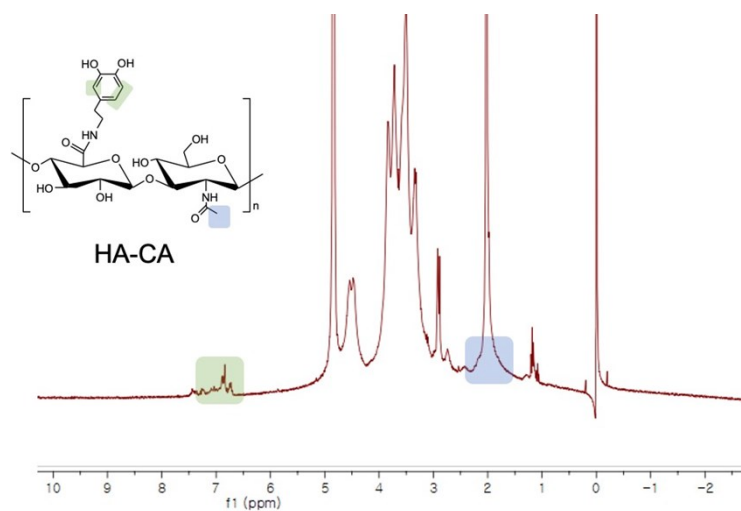
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Supplementary figure 1. Histological evaluation of epithelium (EPI) via H & E staining at 4 and 12 weeks post-esophageal injection. The yellow arrows indicate the enlargement of epithelial cells (cytoplasmic vacuolization). (LM, lumen)



Supplementary figure 2. Quantitative analysis of esophageal submucosa layer. The thickness of the SM (submucosa) was significantly reduced in the two experimental groups injected with MSC-SPs compared to the normal and saline group. (** $p < 0.01$)



Supplementary figure 3. ^1H -NMR spectrum of HA-CA conjugate. The peak at 2.0 ppm represented acetyl group of HA backbone and the peaks at 6.8 ppm represented three aromatic ring protons of catechol group.