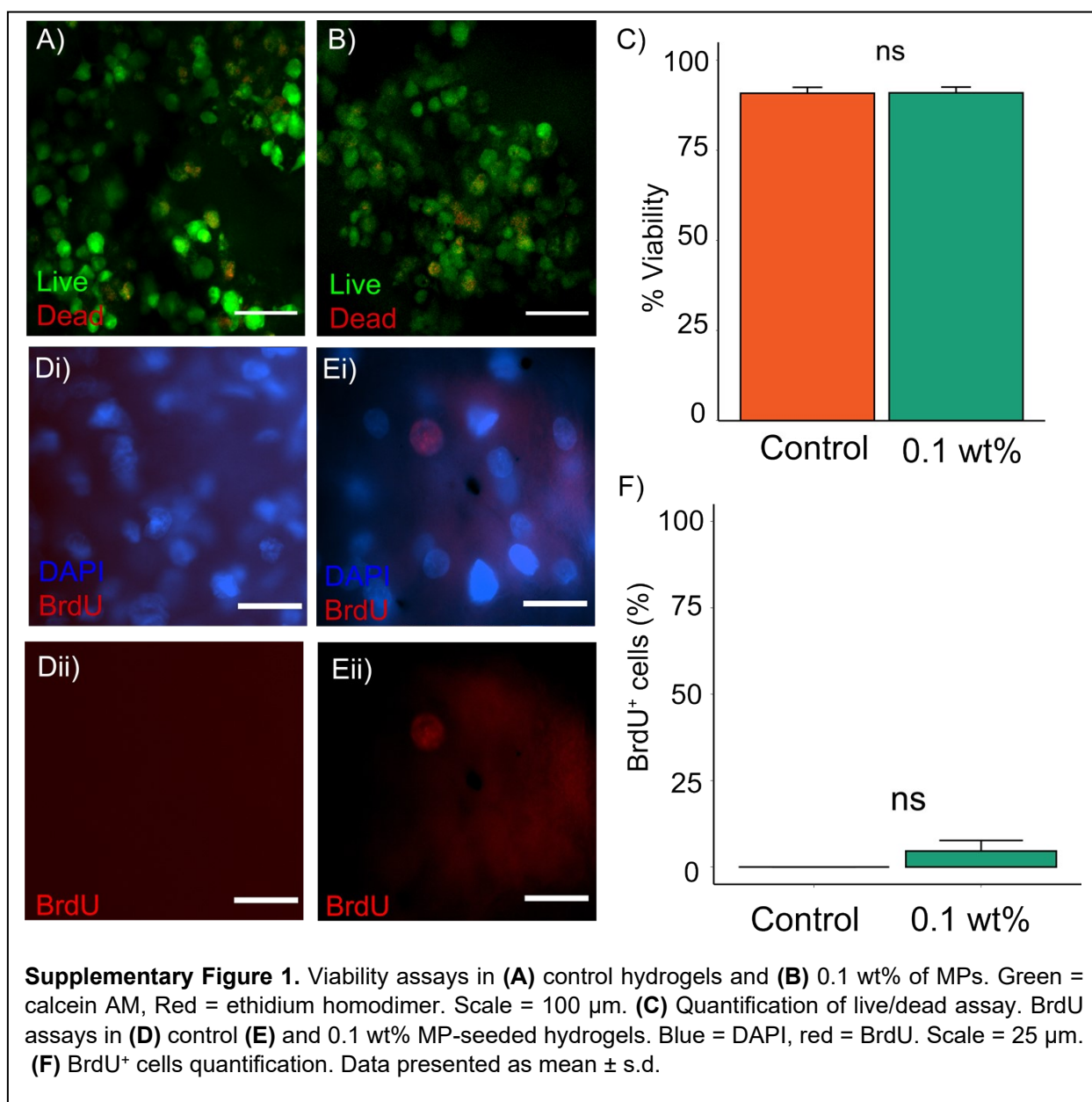
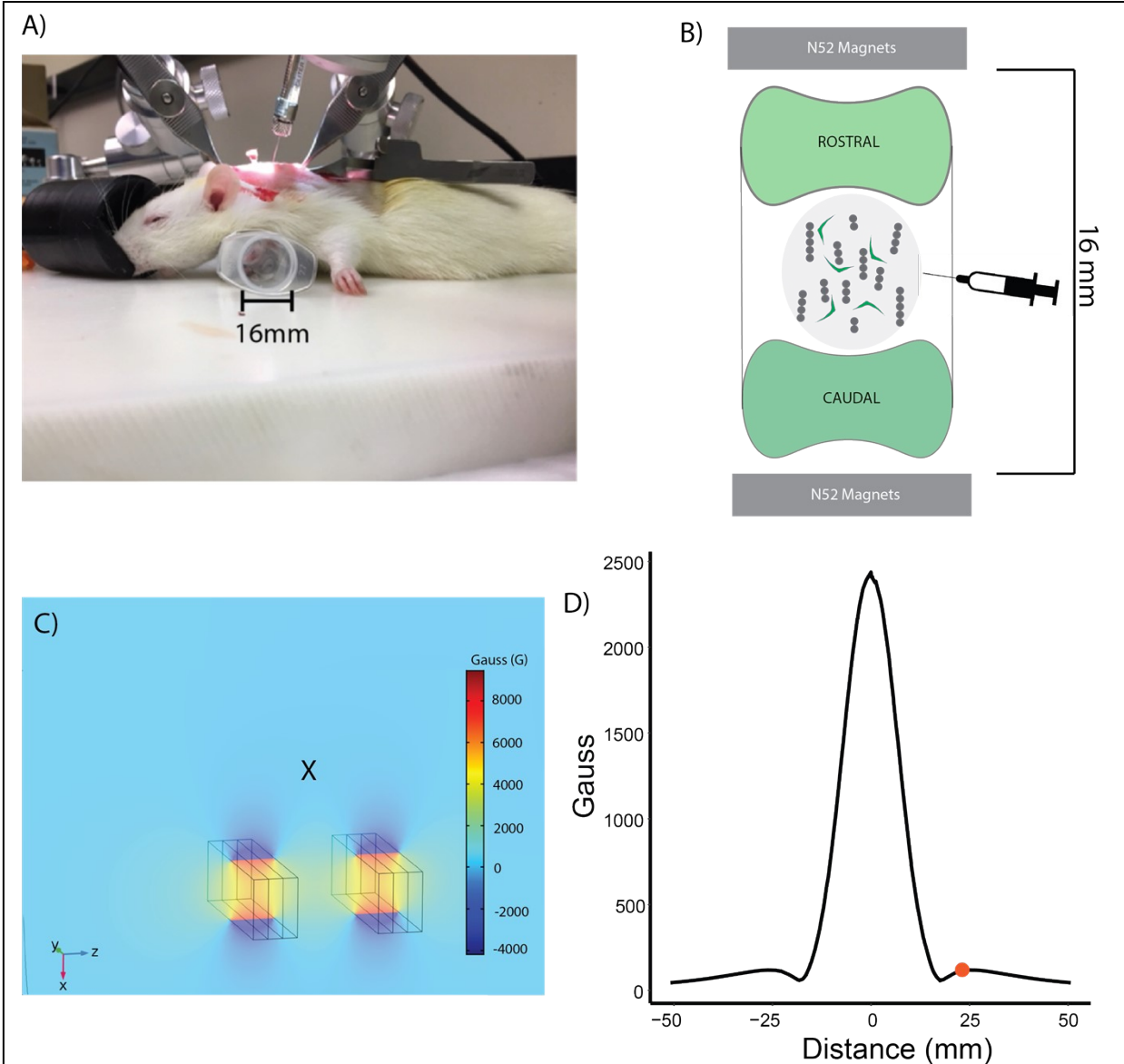
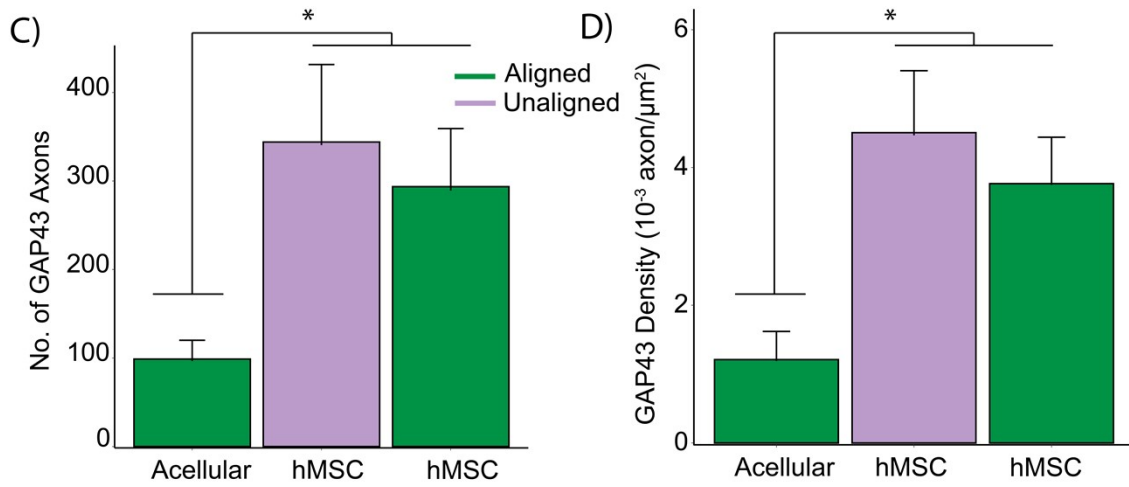
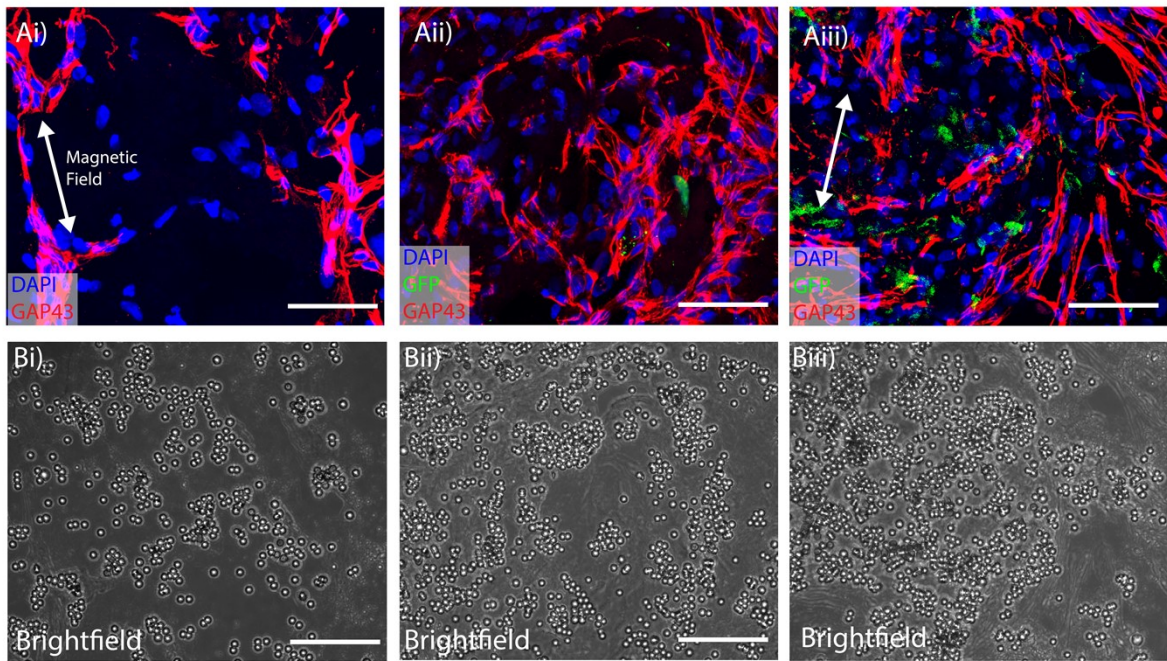


### Supplementary Figures





**Supplementary Figure 2.** Schematic of post-injection alignment. **(A)** Photograph of real-time scaffold injection at the cervical 4-5 following contusive spinal cord injury. **(B)** Schematic of alignment set-up during injection. **(C)** Computational model of the magnetic field applied to the cord. X indicates the location of the cord with respect to the position of the magnets. **(D)** Magnetic field strength along the X-direction. The orange dot reveals the magnetic field strength at approximately 20-mm away from the center of the magnets.



**Supplementary Figure 3.** Assessment of regenerated axons post-injection 2 weeks after spinal cord injury. **(A)** Representative images of GAP43 within **(Ai)** aligned acellular, **(Aii)** unaligned hMSC-seeded and **(Aiii)** aligned hMSC-seeded hydrogels. DAPI (blue), GFP (green), GAP43 (red). **(B)** Brightfield images of each condition. **(C)** GAP43 axon quantification. **(D)** Axon density quantification. Data presented as mean  $\pm$  s.d. \*P < 0.05. Scale = 50- $\mu\text{m}$ .