Supporting Information

A Multifunctional Micropore-Forming Bioink with Enhanced Anti-Bacterial and Anti-Inflammatory Properties

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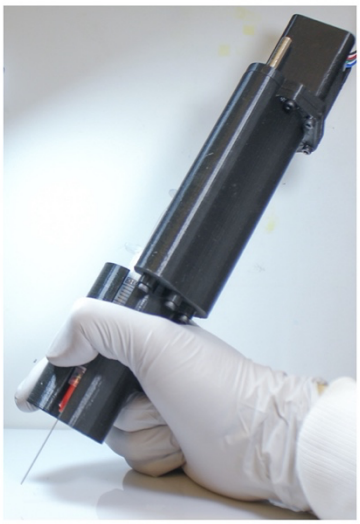

Figure S1. Photograph of the in-house-built handheld bioprinter.

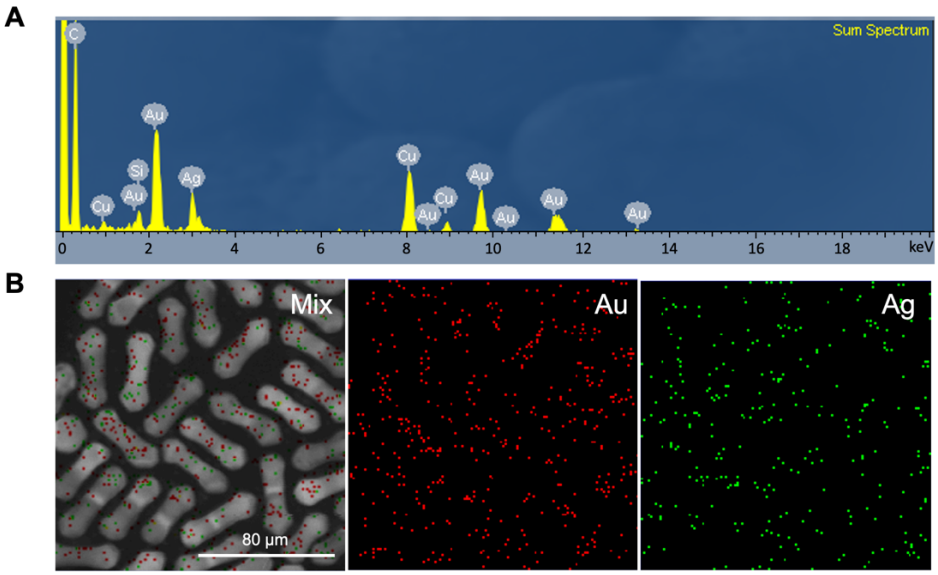

Figure S2. (A) EDX spectrum of the AgGNRs. (B) EDX elemental mapping of the AgGNRs and the distributions of gold and silver elements.

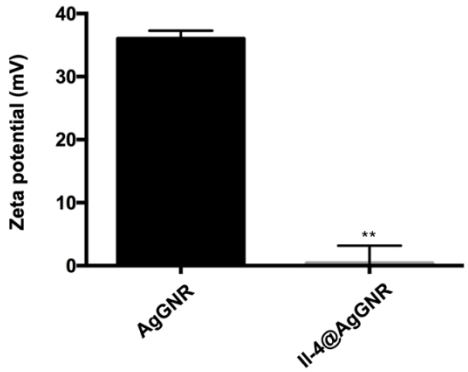

Figure S3. Zeta potentials of AgGNRs and IL-4@AgGNRs. $^{**}P < 0.01$; one-way ANOVA (compared with the AgGNR control group); n = 3.

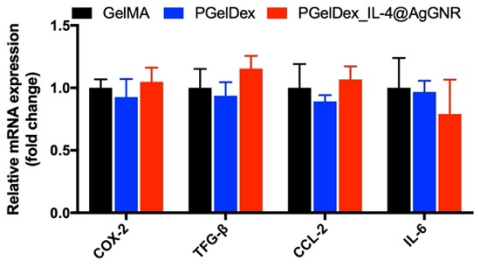

Figure S4. Gene expressions (*COX-2*, *TGF-β*, *CCL-2*, and *IL-6*) of MSCs encapsulated in GelMA, PGelDex, and IL-4@AgGNR-incorporated PGelDex constructs normalized to reference gene *RPL13A* in GelMA.

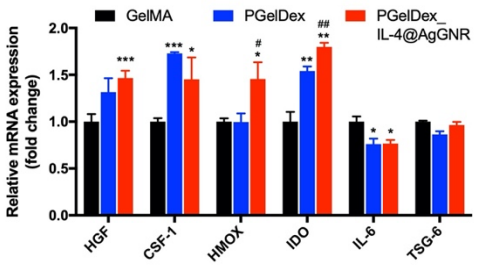

Figure S5. Gene expressions of MSCs encapsulated in GelMA, PGelDex, and IL-4@AgGNR-incorporated PGelDex constructs normalized to reference gene *GAPDH* in GelMA. $^{*}P < 0.05$, $^{**}P < 0.01$, $^{***}P < 0.001$; one-way ANOVA (C, compared with the GelMA control group); $^{\#\#\#}P < 0.001$; one-way ANOVA (compared with the PGelDex group); n = 3.

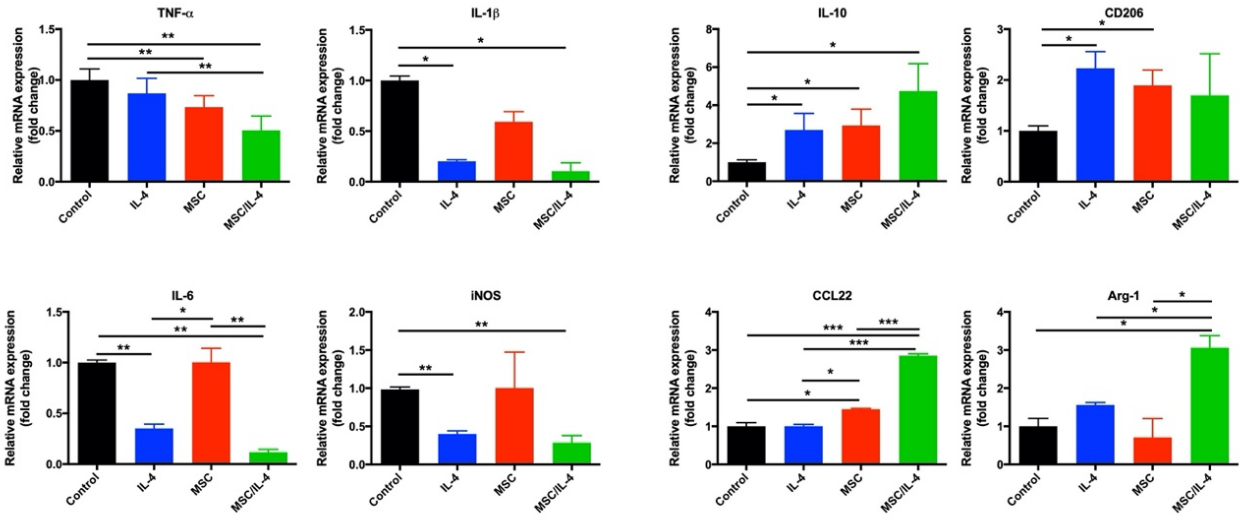

Figure S6. Representative macrophage phenotype markers of THP-1 cells cultured in PGelDex, IL-4@AgGNR-incorporated PGelDex, MSC-encapsulated PGelDex, and MSC-IL-4@AgGNR-incorporated PGelDex constructs through a transwell assay. Relative mRNA expressions were normalized to reference gene *ACTB* in GelMA. $*P < 0.05$, $**P < 0.01$, $***P < 0.001$; one-way ANOVA (compared with the PGelDex control group); n = 3.

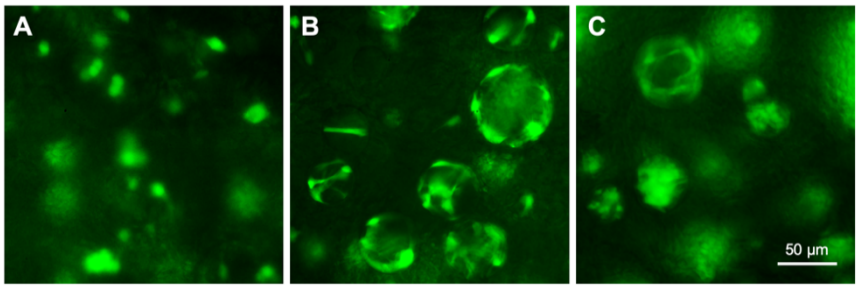

Figure S7. Morphologies of GFP-HUVECs after 6 days of culture in the constructs bioprinted with (A) GelMA, (B) PGelDex, (C) IL-4@AgGNR-incorporated PGelDex bioinks.

Table S1. List of primer sequences used for qRT-PCR measurements of immunomodulatory gene expressions by the MSCs.

Gene	Forward	Reverse
hCCL2	AGGTGACTGGGGCATTGA	GCCTCCAGCATGAAAGTCTC
hCSF-1	TGGCGAGCAGGAGTATCAC	AGGTCTCCATCTGACTGTCAAT
hCOX-2	TGACCAGAGCAGGCAGATGAA	CCACAGCATCGATGTCACCATAG
hTGF-β	AGCGACTCGCCAGAGTGGTTA	GCAGTGTGTTATCCCTGCTGTCA
hTSG-6	TCTGTGCTGCTGGATGGATG	TCCTTTGCGTGTGGGTTGTA
hHMOX	CTTCTTCACCTTCCCCAACA	AGCTCCTGCAACTCCTCAAA
hHGF	GCTATCGGGGTAAAGACCTACA	CGTAGCGTACCTCTGGATTGC
IDO	TTCAGTGCTTTGACGTCCTG	TGGAGGAACTGAGCAGCAT
RPL13A	CGAGGTTGGCTGGAAGTACC	CTTCTCGGCCTGTTTCCGTAG
hGAPDH	GTCTCCTCTGACTTCAACAGCG	ACCACCCTGTTGCTGTAGCCAA

Table S2. List of primer sequences used for qRT-PCR measurements of macrophage marker expressions by the THP-1 cells.

Gene	Forward	Reverse
TNFα	ATGAGCACTGAAAGCATGATCCGG	GCAATGATCCCAAAGTAGACCTGCCC
IL-1β	ATGGCAGAAGTACCTAAGCTCGC	ACACAAATTGCATGGTGAAGTCAGTT
iNOS	ATTCAGGTACGCTGTGTTTGG	CATGGTGAACACGTTCTTGG
IL-6	GGAGACTTGCCTGGTGAAAA	AAAGCTGCGCAGAATGAGAT
CD206	GGGTTGCTATCACTCTCTATGC	TTTCTTGTCTGTTGCCGTAGTT
Arg-1	CACAGTCTGGCAGTTGGAAGC	CTTTGGCAGATATGCAGGGAG
IL-10	TACGGCGCTGTCATCGATT	GGCTTTGTAGATGCCTTTCTCTTG
CCL22	ATCGCCTACAGACTGCACTC	GACGGTAACGGACGTAATCAC
hGAPDH	GTCTCCTCTGACTTCAACAGCG	ACCACCCTGTTGCTGTAGCCAA
ACTB	ATTGCCGACAGGATGCAGAA	GCTGATCCACATCTGCTGGAA