**Supplemental Material**

**Integration of hydrogel microparticles with three-dimensional liver progenitor cell spheroids**



**Supplemental Figure 1:** (A) AggreWell spheroids stained for OPN (Green) and HNF4a (Red) at 0, 1.5 and 3 ng/ml TGF1, Scale bar: 50 µm (B-C) Relative fluorescent intensity and expression of OPN and HNF4a for AggreWell spheroids. \*: P < 0.05

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**Supplemental Figure 2:** Hydrogel microparticle size distribution. Median microparticle radius for these studies was determined to be approximately 7 µm.



**Supplemental Figure 3:** Relative OPN mRNA expression for spheroids treated with the SB-43154 TGFβ (type I) receptor inhibitor, in the presence or absence of TGF1 treatment (1.5 ng/mL).



**Supplemental Figure 4:** Three distinct qRT-PCR replicate experiments demonstrated that heparin-conjugated PEG microparticles promote increased OPN mRNA expression in spheroids in a TGFβ1 concentration dependent manner.

**Supplemental Table 1**: PCR primer pairs

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| **Gene** | **Sequence (5’ to 3’)** |
| Hprt1 | Forward: GGAGTCCTGTTGATGTTGCCAGTAReverse: GGGACGCAGCAACTGACATTTCTA |
| OPN | Forward: ACTACGACCATGAGATTGGCAGTGReverse: CTATAGGATCTGGGTGCAGGCTGTAAA |
| HNF4α | Forward: ATGCGACTCTCTAAAACCCTTGCCReverse: CCAGGCTGTTGGATGAATTGAGGT |