

**Supplementary Table 1. Formulation of HGM medium**

| Reagent                                | Brand          | #         |
|----------------------------------------|----------------|-----------|
| Advanced DMEM / F12 ( $1\times$ )      | Gibco          | 12634010  |
| HEPES ( $10\text{ mM}$ )               | Gibco          | 15630130  |
| GlutaMAX ( $1\times$ )                 | Gibco          | 35050061  |
| Primocin ( $2\text{ }\mu\text{g/ml}$ ) | InvivoGen      | ant-pm-05 |
| B-27 ( $1\times$ )                     | Gibco          | 17504044  |
| N-acetylcysteine ( $1.25\text{ mM}$ )  | MedChemExpress | HY-B0215  |
| RSPO1 ( $1\%$ )                        | Novoprotein    | CX83      |
| Noggin ( $100\text{ ng/ml}$ )          | Novoprotein    | CB89      |
| NRG1 ( $5\text{ ng/ml}$ )              | Novoprotein    | C753      |
| FGF2 ( $10\text{ ng/ml}$ )             | Novoprotein    | C046      |
| FGF10 ( $20\text{ ng/ml}$ )            | Novoprotein    | CR11      |
| A83-01 ( $5\text{ }\mu\text{M}$ )      | MedChemExpress | HY-10432  |
| Nicotinamide ( $10\text{ mM}$ )        | MedChemExpress | HY-B0150  |
| PGE2 ( $3\text{ }\mu\text{M}$ )        | MedChemExpress | HY-101952 |
| CHIR99021 ( $1\text{ }\mu\text{M}$ )   | MedChemExpress | HY-10182  |

**Supplementary Table 2. Primer sequences**

| Gene          | F                       | R                       |
|---------------|-------------------------|-------------------------|
| VEGF $\alpha$ | GCACATAGAGAGAATGAGCTTCC | CTCCGCTCTGAACAAGGCT     |
| HGF           | ACTTCTGCCGGTCCTGTTG     | CCCCTGTTCCCTGATACACCT   |
| bFGF          | GCGACCCACACGTCAAACCTA   | CCGTCCATCTTCCTTCATAGC   |
| TGF $\beta$   | CCACCTGCAAGACCATCGAC    | CTGGCGAGCCTTAGTTTGGAC   |
| CK10          | GCCTCCTACATGGACAAAGTC   | GCTTCTCGTACCACTCCTTGA   |
| CK19          | GTTTACGTACGCATTGGGTCAG  | GAGGACGAGGTCACGAAGC     |
| CD80          | TCAGTTGATGCAGGATACACCA  | AAAGACGAATCAGCAGCACAA   |
| TNF $\alpha$  | CAGGCGGTGCCTATGTCTC     | CGATCACCCCGAAGTTCAGTAG  |
| IL-1b         | GAAATGCCACCTTTTGACAGTG  | TGGATGCTCTCATCAGGACAG   |
| IGF1          | CACATCATGTCTGCTTCACACC  | GGAAGCAACACTCATCCACAATG |
| IL-10         | CTTACTGACTGGCATGAGGATCA | GCAGCTCTAGGAGCATGTGG    |
| IL-13         | TGAGCAACATCACACAAGACC   | GGCCTTGCGGTTACAGAGG     |