

## Supporting information

### Hyaluronic acid-based extracellular matrix triggers spontaneous M2-like polarity of monocyte/macrophage

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#### Supplementary method

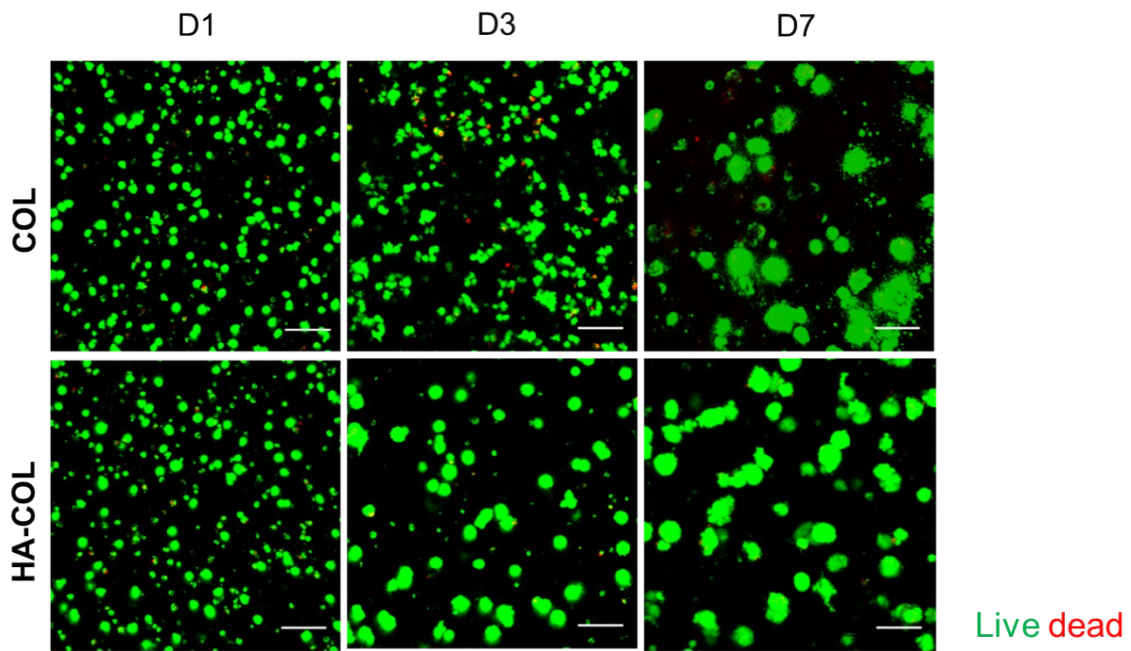
##### Live dead staining

Culture medium was removed from cell and washed DPBS. LIVE/DEAD™ Viability/Cytotoxicity Kit (Invitrogen™) was treated to cell. for 15 min at 37 °C. Then, Fresh culture medium was added to cell and image the sample by microscope.

hHAS1	GGTGGGGACGTGCGGATC	ATGCAGGATACACAGTGGAAGTAG
hHAS2	GTGGATTATGTACAGGTTTGTGA	TCCAACCATGGGATCTTCTT
hHYAL1	CATCAAGGAGTATATGGACAC T	CAGGGTTAAGGAGGAGGA
hHYAL2	GATTACCTGACACGGCTG	GAAACTGTTGGTGCTGAGA
hHYAL3	TTTCCCTGCTGCCACTT	CTTGGGAGGGTTGACTGTAA

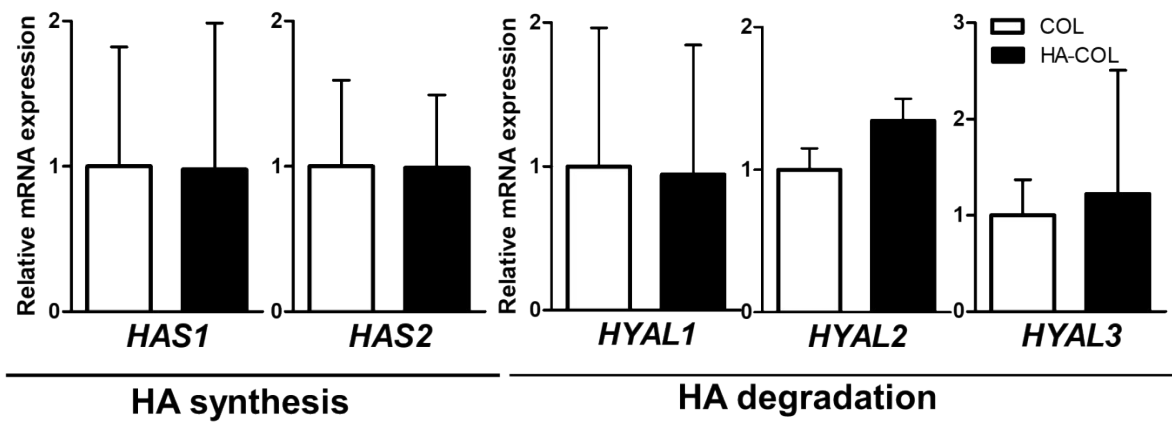
**Supplementary table 1 Primer sequences used in qRT-PCR**

## Cell viability of THP-1 within 3D matrix



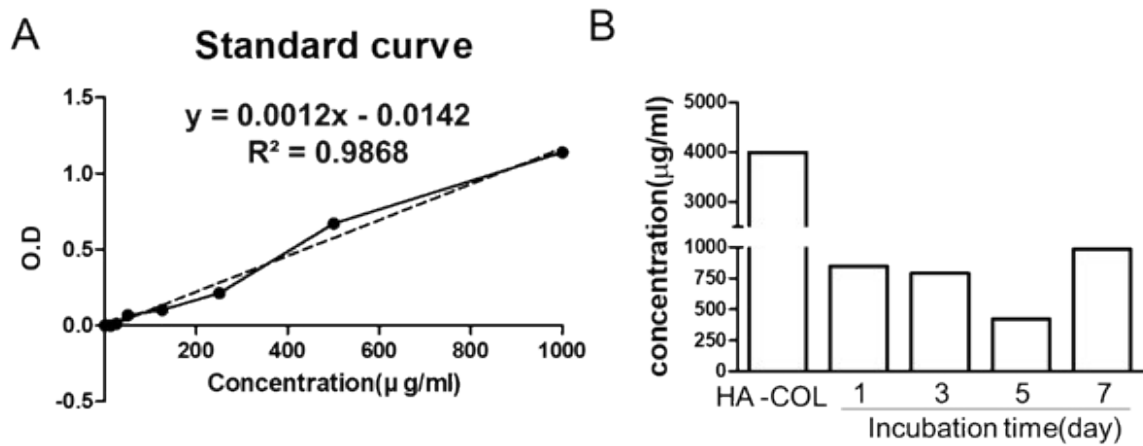
**Supplementary figure 1 Images of live/dead staining of THP-1 cells in the 3D matrix**

Green indicates live cells and Red indicates dead cells (scale bar : 100µm)



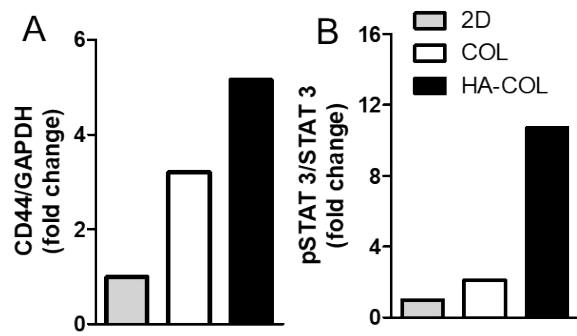
**Supplementary figure 2 Gene expression of HA metabolic gene**

Relative gene expression levels of HA synthesis (*HAS1*, *HAS2*) and HA degradation (*HYAL1*, *HYAL2*, *HYAL3*) (n=4; significant difference is determined by Student's t-test, no sign for no significant difference)



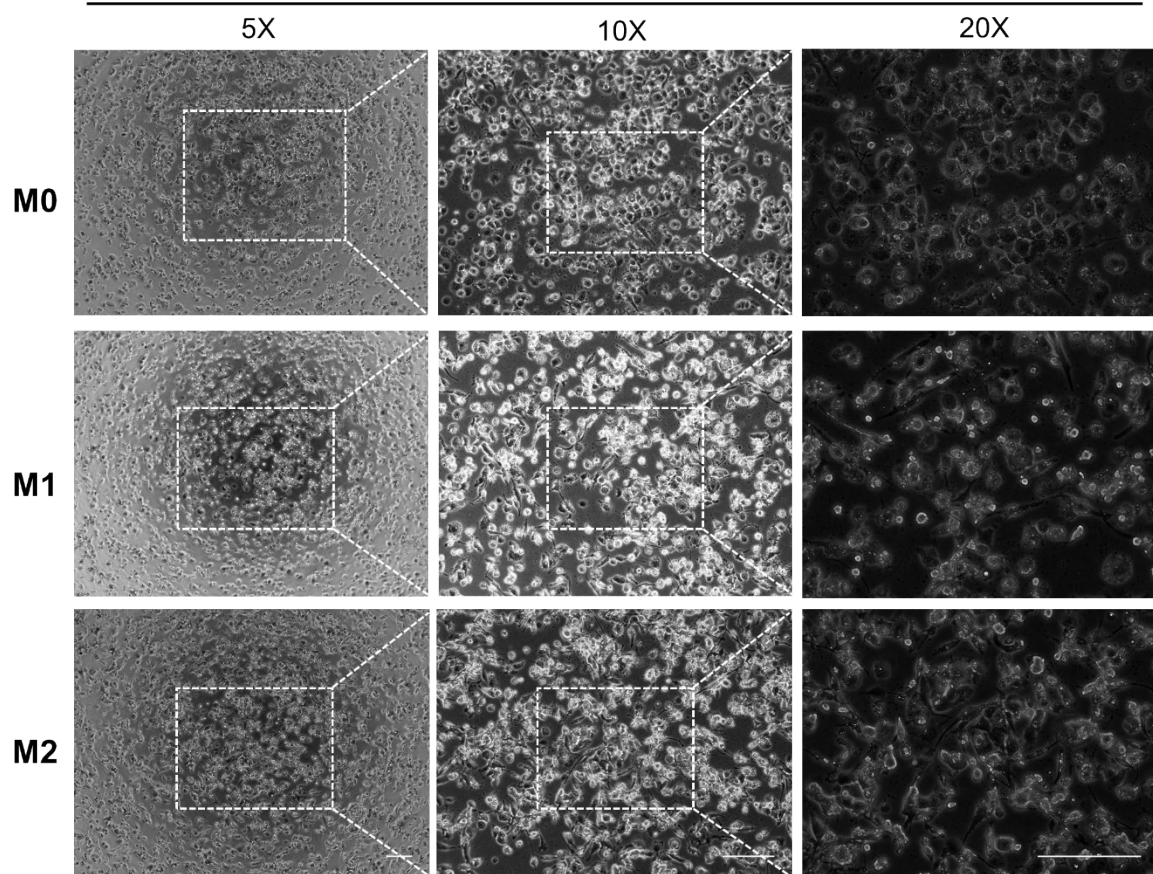
**Supplementary figure 3 HA releasing assay**

(A) Standard curve for HA releasing assay with HA solution. (B) Concentration of HA concentration from cell culture medium every 2 day. The concentration of HA is no significant difference among samples according to time. (n=3; significant differences were determined by Student's *t*-test, no sign for no significant difference)



**Supplementary figure 4 Quantification of western blot analysis.** Densitometry was performed by Image J to quantify the expression of representative protein. (A), (B) The expression of CD44 and phosphorylated STAT3 (pSTAT3) was normalized to expression of GAPDH and total expression of STAT3 respectively.

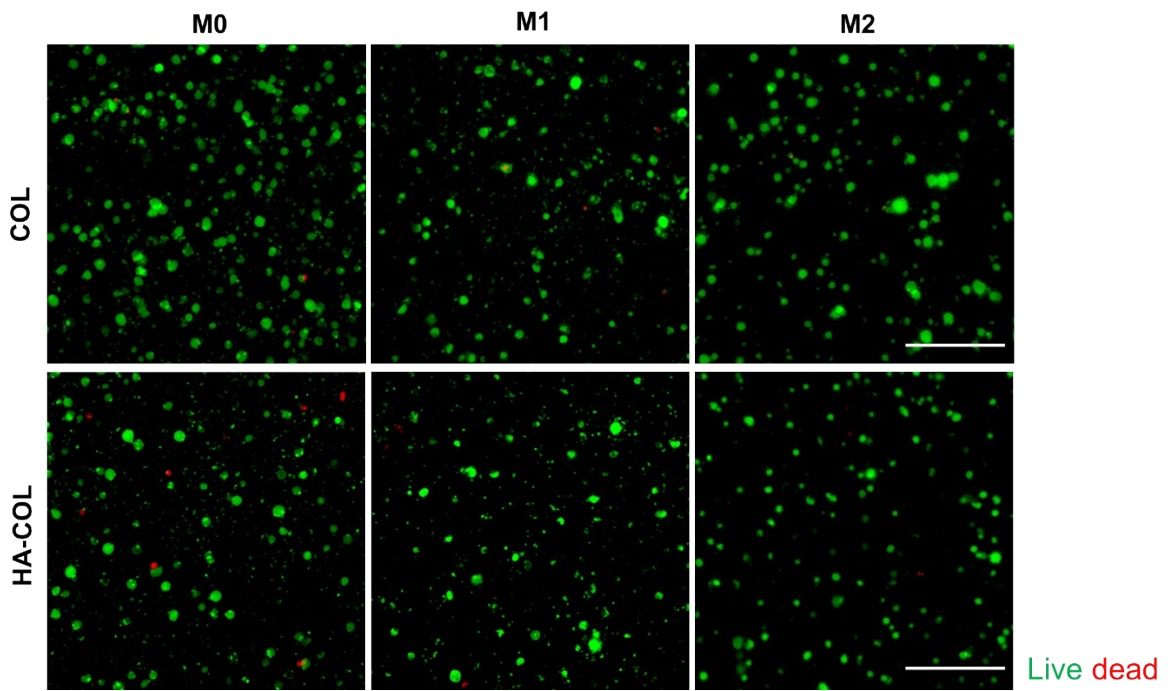
## Morphology of differentiated THP-1 cells in 2D



**Supplementary figure 5 Morphology of differentiated THP-1 cells in 2D**

Phase images of differentiated THP-1 cells (M0, M1, M2) after 5 day cultivation (Scale bar : 200 $\mu$ m)

Cell viability of differentiated THP-1 cells in 3D



Supplementary figure 6 Images of live/dead staining of differentiated THP-1 cells within 3D matrix

Green indicates live cells and Red indicates dead cells (Scale bar : 200 $\mu$ m)

**Supplementary video**

**Supplementary video 1 Live imaging of THP-1 cells within COL**

**Supplementary video 2 Live imaging of THP-1 cells within HA-COL**