Supplementary Table 1. List of primers used in the RT-PCR analysis of gene expression in ATDC5 cells.

|  |  |
| --- | --- |
| Primer ID | Primers (5’- 3’) |
| GAPDH-F | TGTGTCCGTCGTGGATCTGA |
| GAPDH-R | TTGCTGTTGAAGTCGCAGGAG |
| Agg-F | AGTGGATCGGTCTGAATGACAGG |
| Agg-R | AGAAGTTGTCAGGCTGGTTTGGA |
| Col II-F | AGGGCAACAGCAGGTTCACATAC |
| Col II-R | TGTCCACACCAAATTCCTGTTCA |
| Col X-F | CTCCTACCACGTGCATGTGAA |
| Col X-R | ACTCCCTGAAGCCTGATCCA |
| Col I-F | ATGCCGCGACCTCAAGATG |
| Col I-R | TGAGGCACAGACGGCTGAGTA |

Supplementary Table 2. List of primers used in the RT-PCR analysis of gene expression in chondrocytes.

|  |  |
| --- | --- |
| Primer ID | Primers (5’- 3’) |
| GAPDH-F | CACCCACTCCTCTACCTTCG |
| GAPDH-R | GGTCTGGGATGGAAACTGTG |
| Agg-F | GGAGGTCGTGGTGAAAGGTG |
| Agg-R | CTCACCCTCCATCTCCTCTG |
| Col II-F | GTGGAAGAGCGGTGACTAC |
| Col II-R | TAGGTGATGTTCTGGGAGC |
| Col X-F | AGTTCTTCATTCCCTATGCCA |
| Col X-R | CAATGTCTCCTTTCGGTCCA |
| Col I-F | GGTGCTGCTGGTAAAGAAGG |
| Col I-R | GTCTACCCAAAGCACCAG |



Supplementary Figure 1. Cell viability of ATDC5 cells when treated with different concentrations of galactose. (A) IC50 curves of ATDC5 towards galactose. Cells were cultured for 72 h. IC50 value of ATDC5 simulated by GraphPad is about 99.6 mM. (B) Proliferation histogram of ATDC5 co-cultured with a range of concentrations of galactose up to 7 days.



**Supplementary Figure 2**. (**A**) Quantitative analysis of Alcian blue staining of GAG accumulation in ATDC5 cells on day 3, 7, 14 and 21. (**B**) Quantitative analysis of GAG/DNA in ATDC5 cells, the amount of GAG was below detection limit on day 3.



Supplementary Figure 3. Immunofluorescence staining for type X collagen (A) and type I collagen (B) of ATDC5. Type X collagen and type I collagen were stained with red and nuclei was stained with blue. Scale bar = 50 µm.



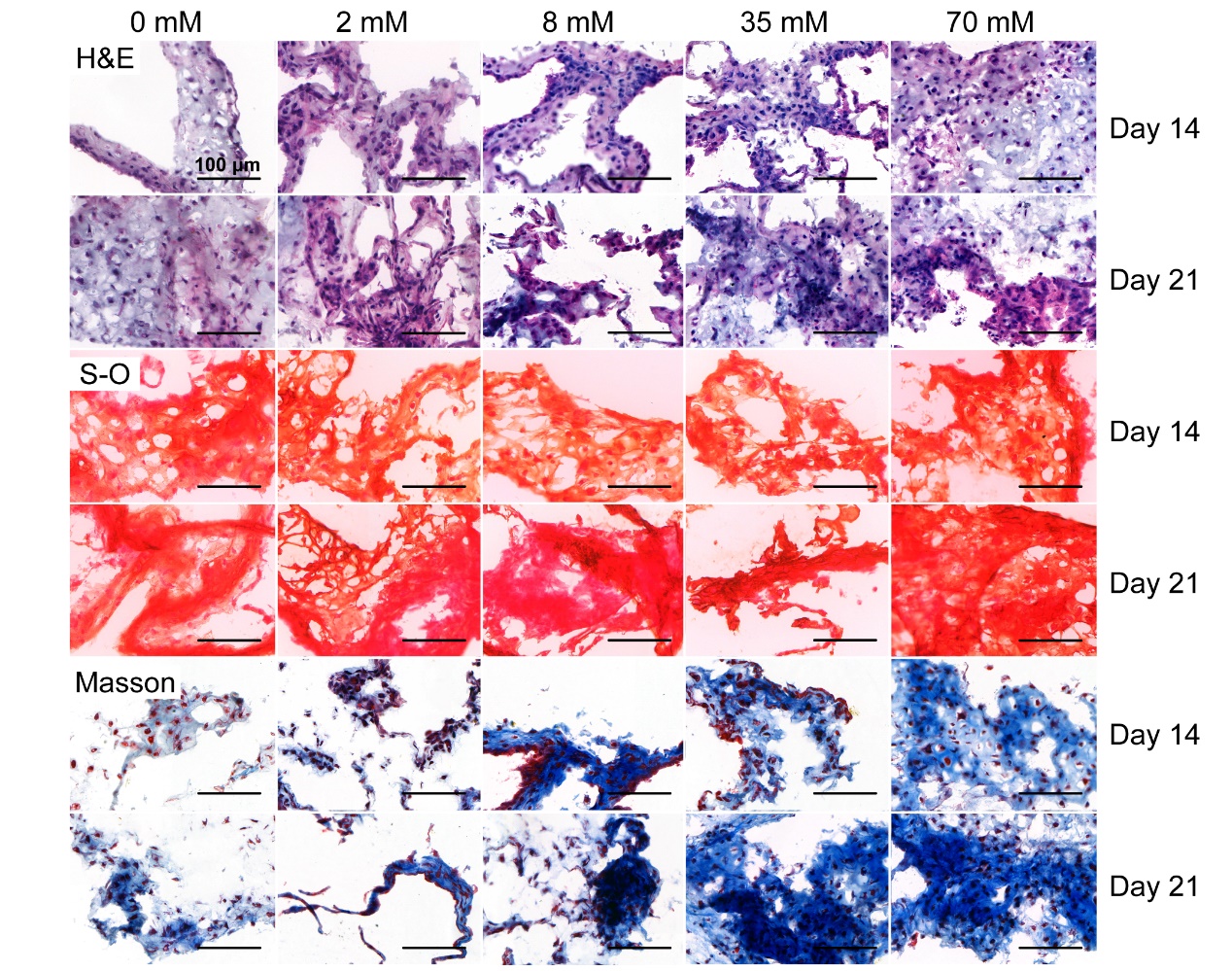
Supplementary Figure 4. Cell viability of chondrocytes when treated with different concentrations of galactose. (A) IC50 curves of chondrocytes towards galactose. Cells were cultured for 72 h. IC50 value of chondrocytes simulated by GraphPad is about 498.5 mM. (B) Proliferation histogram of chondrocytes co-cultured with a range of concentrations of galactose up to 7 days.



**Supplementary Figure 5**. (**A**) Quantitative analysis of Alcian blue staining of GAG accumulation in chondrocytes on day 3, 7, 14 and 21. (**B**) Quantitative analysis of GAG/DNA in chondrocytes, the amount of GAG was below detection limit on day 3.



Supplementary Figure 6. Immunofluorescence staining for type X collagen (A) and type I collagen (B) of chondrocytes. Type X collagen and type I collagen were stained with red and nuclei was stained with blue. Scale bar = 50 µm.



Supplementary Figure 7. Histological staining of chondrocyte masses (H&E, Safranin-O and Masson). Scale bar = 100 µm.