Supplementary Information for

Tauroursodeoxycholic acid (TUDCA) counters osteoarthritis by regulating intracellular cholesterol levels and membrane fluidity of degenerated chondrocytes

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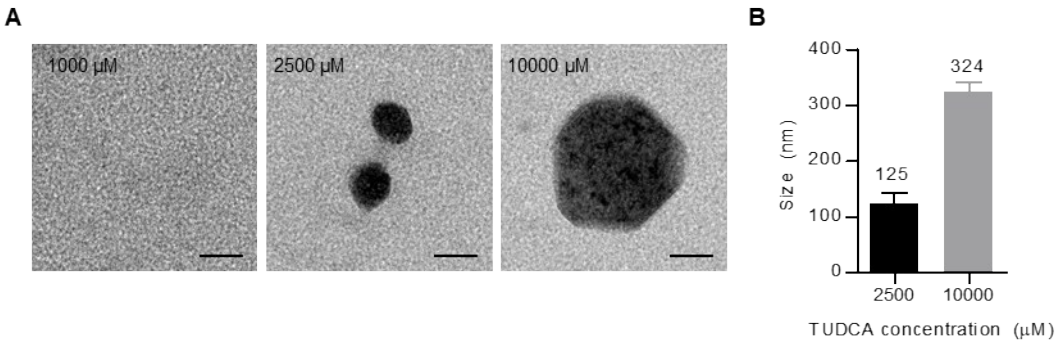
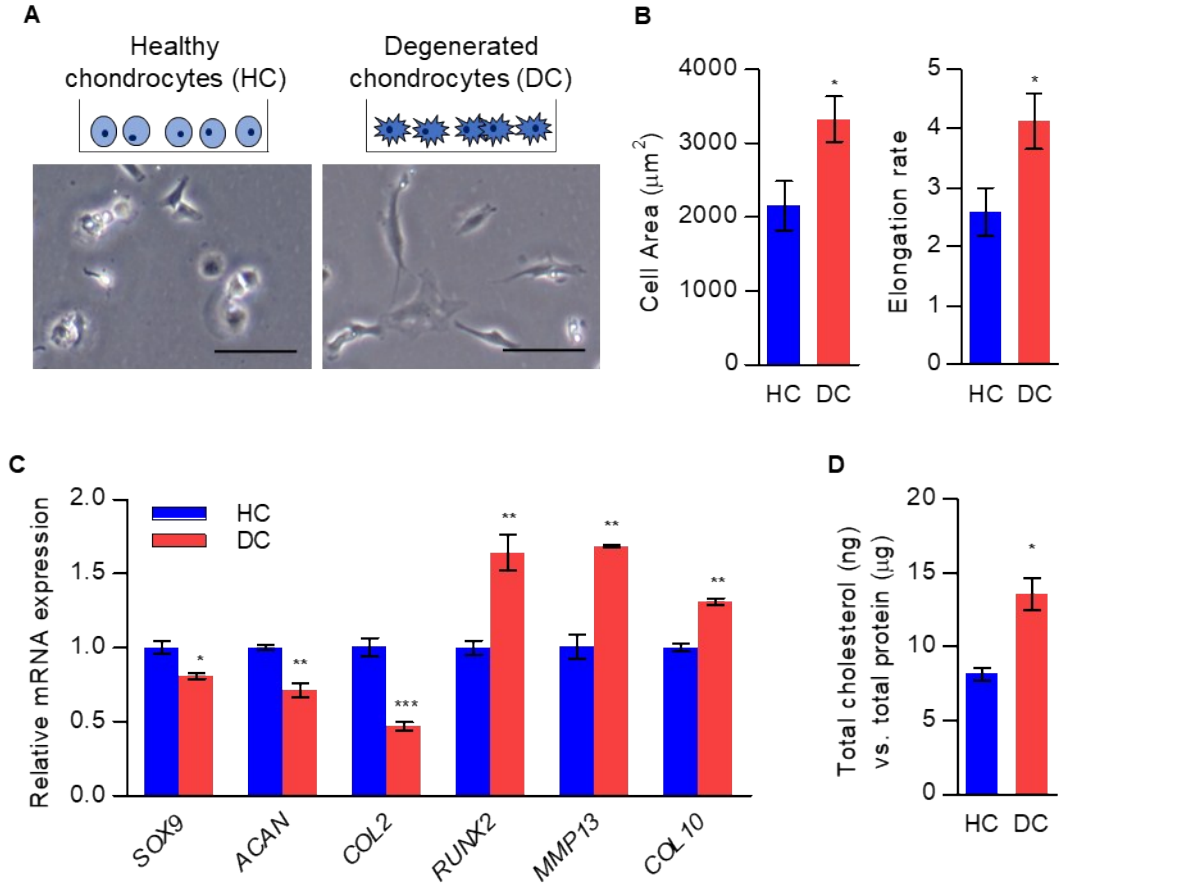
Keywords: Tauroursodeoxycholic acid (TUDCA), Cholesterol, Osteoarthritis, Membrane fluidity, Chondrocyte, Bile acid

Supplementary Figure 1



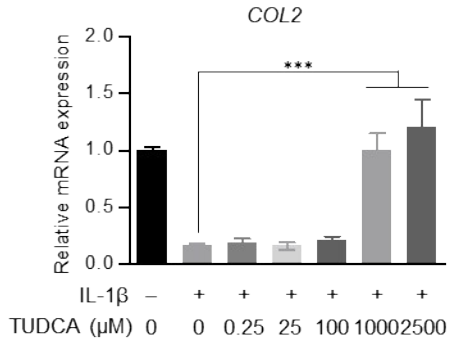
Supplementary Figure 1. Micelle formation of TUDCA in DPBS. (**A**) TEM images of TUDCA micelles in DPBS at 1000, 2500, and 10000 μM. Scale bar, 100 nm. (**B**) Average diameter of a TUDCA micelle was measured using ImageJ software. Data are mean ± s.e.m. (n=4)

Supplementary Figure 2



Supplementary Figure 2. Isolation of healthy or degenerated chondrocytes from patients with OA. (**A**) Isolation of healthy (HCs) and degenerated chondrocytes (DCs) from human knee cartilage. Cell morphology of HCs and DCs at passage 2. Scale bar, 100 μm. (**B**) Cell area and elongation rate of HCs and DCs were measured and quantified at passage 2 using ImageJ software. Data are mean ± s.e.m. (n=15, Student's t-test, **P*<0.05). (**C**) mRNA expression of chondrogenic marker genes (SOX9, COL2, and ACAN) and hypertrophic marker genes (COL10, MMP13, and RUNX2) in HCs and DCs were assessed by qPCR at 7 days of treatment. Data are mean ± s.e.m. (n=3, Student's t-test, **P*<0.05, ***P*<0.01). (**D**) Total cholesterol of HCs and DCs at passage 2 was normalized to the total protein content of the cells. Data are mean ± s.e.m. (n=3, Student's t-test, **P*<0.05).

Supplementary Figure 3



Supplementary Figure 3. The effect of TUDCA on hypertrophic-induced chondrocytes using IL-1β. mRNA expression of *COL2* in hypertrophy induced HCs following IL-1β treatment was assessed by qPCR at 7 days after treatment with or without TUDCA. Data are mean ± s.e.m. (n=4, One-way ANOVA, ****P*<0.001)**.**