**Supplemental Data 1. Characteristics of the chondrocytes from five dogs.**

**Cell culture**

Second passage canine chondrocytes from humeral heads of five dogs (three 3-year-old female experimental beagles, one 4-year-old female experimental beagle, and one 13-year-old castrated male mixed-breed) were seeded in 6-well plates at an initial density of 5.0 × 104 cells/cm2 and cultured at 37 °C in 5% CO2. After incubated for 24 hr, the medium was changed, and the cells were cultured for an additional 72 hr.

**RNA extraction and quantitative real-time polymerase chain reaction (qPCR)**

Total RNA of canine chondrocytes was extracted using a NucleoSpin RNA Purification Kit (Macherey-Nagel, Dürren, Germany), then reverse-transcribed into cDNA using a M-MLV RT Kit (Invitrogen, Carlsbad, CA, U.S.A.). Target genes were analyzed by qPCR with a KAPA SYBR FAST qPCR Kit (KAPA Biosystems, Woburn, MA, U.S.A.). The primers of hyaline cartilage specific genes, type II collagen alpha 1 chain (*COL2A1*) and SRY-box 9(*SOX9*) genes, were used to characterize the chondrogenic phenotype. Type I collagen alpha 2 chain (*COL1A2*) was evaluated to detected possible dedifferentiation to a fibroblast-like phenotype. Glyceraldehyde-3-phosphate dehydrogenase (*GAPDH*) gene was used as an internal reference. The primer information is shown in Table. 1 of main text.

**Results**

The gene expression levels are expressed as average with the standard deviation of triplicated raw Ct values. The expression of *COL2A1* and *SOX9* were confirmed in all five specimens, indicated the hyaline cartilage origin of the chondrocytes. The expression of COL1A2 suggested that the chondrocytes possibly underwent dedifferentiation during *in-vitro* culture.

 **Suppl Fig 1. The phenotype-related gene expression levels of chondrocytes from five dogs.**

After 72 hr culture, the gene expression levels of glyceraldehyde-3-phosphate dehydrogenase (*GAPDH*), type II collagen alpha 1 chain (*COL2A1*), type I collagen alpha 2 chain (*COL1A2*), and SRY-box 9 (*SOX9*) in chondrocytes from five dogs were measured by qPCR. The results showed the Ct values of target genes. All data expressed as mean ± SD of a triplication.