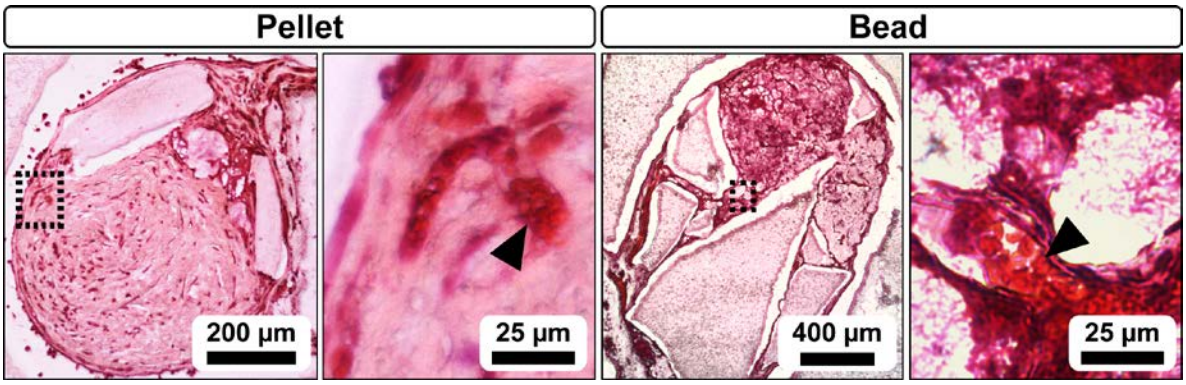
obtained by normalizing the number of blood vessels to the total number of cells. The presence of red blood cell-containing lumina was verified via high magnification bright field microscopy and H&E staining (Figure S1). Statistical analyses were performed in Prism (GraphPad, La Jolla, CA). Significance was assessed by Student's t-test or 2-way ANOVA and Tukey's post-hoc test ($p < 0.05$). Data are presented as mean ± SEM.



Supplemental Figure 1: H&E staining of 8 week explanted tissues, highlighting the presence of infiltrating blood vessels. Black dashed boxes indicate the area magnified in the right panel of each sample; black arrowheads mark the presence of red blood cells within blood vessel lumina.

3. Results

3.1. *In vitro* analysis

3.1.1. DNA and biochemical quantification

Histological evaluation of samples at the time of implantation highlighted the size differential between the two culture types, as the diameter of the beads was approximately twice that of the pellets (Figure 2A,B). Further inspection of H&E stained sections confirmed the presence of enlarged cells, characteristic of hypertrophic chondrocytes, in both cell pellets and cell-seeded alginate beads (Figure 2A,B insets). Quantification of