PURPOSE. Syndecan-4 plays a critical role in cartilage degradation during osteoarthritis (OA). The aim of this study was to investigate the expression and localization of syndecan-4 in different OA joint tissues.

METHODS. Syndecan-4 mRNA levels were quantified by RT-PCR in human OA primary cells. Syndecan-4 was localized by immunohistochemistry in knee, hip or shoulder OA bone/cartilage biopsies. Syndecan-4 was quantified by immunoassay in chondrocytes culture supernatant and cell fraction.

RESULTS. No significant difference was detected in syndecan-4 expression level in sclerotic compared to non-sclerotic osteoblasts or in inflamed synoviocytes compared to normal/reactive ones. Differentiated hypertrophic chondrocytes from knee, but not from hip cartilage, expressed more syndecan-4 than non-hypertrophic cells. Using an immunoassay for the extracellular domain of syndecan-4, we found 68% of the syndecan-4 in the culture supernatant of OA chondrocytes culture, suggesting that a large majority of the syndecan-4 is shed and released in the extracellular medium. The shedding rate was not affected by hypertrophic differentiation state of the chondrocytes or their joint origin.

CONCLUSION. Even if chondrocytes clusters are seen in OA knee, hip and shoulder cartilage and hypertrophic differentiation appears in knee and hip OA articular chondrocytes, syndecan-4 synthesis only increased in knee. These findings suggests the presence of biochemical difference between articular cartilage according to their location and that syndecan-4 could be a biochemical marker specific for knee OA.