activated. Explain the progressive joint damage after inflammatory pathways are activated. IL-1 decreases the available antioxidant protection in the joint may damage to structural matrix proteins and alter cell signaling pathways. Chronic oxidative stress may increase cell senescence, cause cytokines and mechanical forces leaving the tissue vulnerable to oxidative damage. Cartilage tissue generates reactive oxygen species in response to IL-1 receptor antagonist reduces nitric oxide production. ECSOD scavenges superoxide and prevents oxidative damage. Figure 2. Total nitrate/nitrite measured from OA cartilage treated with and without IL-1beta. Results: Exogenous BMP-2 improved the chondrogenic character of HACs when amplified over two passages in monolayer. The stimulatory effect of BMP-2 on type II collagen expression was observed not only at the mRNA level but also at the protein level, and this is crucial for cartilage matrix reconstruction. Our preliminary data with HACs first amplified in monolayer and then cultured in collagen sponges showed better cartilage repair. Conclusions: ECSOD scavenges superoxide and prevents oxidative damage in the joint. Cartilage tissue generates reactive oxygen species in response to cytokines and mechanical forces leaving the tissue vulnerable to oxidative damage. Chronic oxidative stress may increase cell senescence, cause damage to structural matrix proteins and alter cell signaling pathways leading to osteoarthritis. The finding that a key inflammatory cytokine (IL-1) decreases the available antioxidant protection in the joint may explain the progressive joint damage after inflammatory pathways are activated.

Conclusions: ECSOD scavenges superoxide and prevents oxidative damage in the joint. Cartilage tissue generates reactive oxygen species in response to cytokines and mechanical forces leaving the tissue vulnerable to oxidative damage. Chronic oxidative stress may increase cell senescence, cause damage to structural matrix proteins and alter cell signaling pathways leading to osteoarthritis. The finding that a key inflammatory cytokine (IL-1) decreases the available antioxidant protection in the joint may explain the progressive joint damage after inflammatory pathways are activated.

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BONE MORPHOGENETIC PROTEIN-2 IS A SPECIFIC CHONDROGENIC INDUCER WITH POTENTIAL USE FOR (MATRIX-ASSOCIATED) AUTOLOGOUS CHONDROCYTE IMPLANTATION

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Purpose: The aim of this study was to investigate if addition of bone morphogenetic protein (BMP)-2 to human articular chondrocytes (HACs) could help to maintain their chondrogenic phenotype in long-term culture conditions necessary for autologous chondrocyte implantation (ACI). We also evaluated the potential of BMP-2 as a repair factor in combination with collagen-based biomaterials, to extend the technique to osteoarthritic lesions.

Methods and Material: In a first step, HACs from 19 donors were cultured independently, according to the procedure used for ACI. Real-time PCR and Western blotting were used to evaluate the chondrocyte phenotype and gel retardation assays were performed to analyze DNA binding of transcription factors under the effect of BMP-2. Next, we evaluated the responsiveness of HAC to BMP-2 when cultured within collagen sponges. This first approach was undertaken with independent cultures of three donors and the cellular phenotype was estimated by using real-time PCR.

Results: Exogenous BMP-2 improved the chondrogenic character of HACs when amplified over two passages in monolayer. The stimulatory effect of BMP-2 on type II collagen expression was observed not only at the mRNA level but also at the protein level, and this is crucial for cartilage matrix reconstruction. Our preliminary data with HACs first amplified in monolayer then cultured in collagen sponges in the presence of BMP-2 have revealed that BMP-2 is able to restore COL2A1 gene expression that was lost during the amplification step. Conclusions: Adding exogenous BMP-2 to HACs expanded in the conditions generally used for ACI or during Matrix-associated ACI is clearly beneficial to support the chondrocytic phenotype. Importantly, no sign of hypertrophic maturation or osteogenic induction was detected beside the beneficial to support the chondrocytic phenotype. Importantly, no sign of hypertrophic maturation or osteogenic induction was detected beside the

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ELUCIDATING THE MECHANISM OF OSTEOARTROPATHY IN ALKAPTONURIA: LESSONS FOR OSTEOARTHRITIS

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Purpose: Alkaptonuria (AKU) is a rare autosomal recessive condition re-

Figure 1. Mean EC-SOD secretion by human OA cartilage in vitro treated with IL-1beta.

Figure 2. Total nitrate/nitrite measured from OA cartilage treated with and without IL-1beta.