A Stem Cell-Based Approach to Cartilage Repair.

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Public Summary:
Osteoarthritis (OA) is a degenerative joint disease that involves destruction of articular cartilage and eventually leads to disability. Molecules that promote the selective differentiation of multipotent mesenchymal stem cells (MSCs) into chondrocytes may stimulate the repair of damaged cartilage. Using an image-based, high-throughput screen, we identified the small molecule kartogenin, which promotes chondrocyte differentiation (EC(50) = 100 nM), shows chondroprotective effects in vitro, and is efficacious in two OA animal models. Kartogenin binds filamin A, disrupts its interaction with the transcription factor CBFbeta, and induces chondrogenesis by regulating the CBFbeta-RUNX1 transcriptional program. This work provides new insights into the control of chondrogenesis that may ultimately lead to a stem cell-based therapy for osteoarthritis.

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