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## **MicroRNA-29a protects against cartilage degradation, synovial inflammation, subchondral bone loss in Osteoarthritic knees**

Feng-Sheng Wang, Pei-Chin Chung, Yi-Chih Sun and Jih-Yang Ko  
Kaohsiung Chang Gung Memorial Hospital, Taiwan

Osteoarthritis (OA) of knee is one of most prevalent degenerative joint disorders and a leading cause of knee arthroplasty for the elders. Cartilage degradation and subchondral bone destruction are prominent features of OA knee pathogenesis. MicroRNA-29a (miR-29a) is a small non-coding RNA reportedly contributing to regulate collagen gene expression or bone formation capacity in osteoporotic bone tissues. In collagenase-mediated OA knee models, severe articular cartilage damage and subchondral bone exposure is associated with the reduced miR-29a expression in joint lesion. Interestingly, injured knees in miR-29a transgenic mice exhibited better gait characteristics and less joint inflammation reaction than those in wild-type mice as detected by catwalk and *in vivo* near-infra red imaging. Of note, overexpression of miR-29a decreased chondrocyte apoptosis, leukocyte infiltration and osteoclast recruitment, as well as improved the cartilage injury, synovitis and subchondral bone mass loss in injured knee joint microenvironments. Gain of miR-29a function attenuated the OA-induced promotion of cartilage-degrading proteinase expression and increased cartilage matrix expression. *Ex vivo*, miR-29a transgenic mice had higher chondrogenic differentiation capacities of primary bone-marrow mesenchymal stem cells than those in wild-type mice. Several signaling transductions, including the Wnt/ $\beta$ -catenin signaling components and epigenetic pathways in knee joint tissues actively responded to miR-29a regulation. Collectively, miR-29a acts as a master regulator for stabilizing cartilage, synovial and subchondral bone homeostasis. Increasing miR-29a signaling is an innovative molecular strategy for preventing form OA-mediated joint damage. Therapeutic potential of miR-29a for rescuing OA joint is merit of exploration.

### **Biography**

Feng-Sheng Wang earned PhD of National Taiwan University at the age of 28 and has been long-term enthusiastically devoted himself to the mesenchyme stem cell biology, regenerative medicine and bone and joint disorders. He is currently the Director of Programs for Phenomics and Diagnostic, Kaohsiung Chang Gung Memorial Hospital. He has published more than 95 relevant papers in many high profile journals and been serving as a member of editorial board of many journals and academy.

wangfs@ms33.hinet.net