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Role of primary cilia of chondrocytes under mechanical stimulation in osteoarthritis

Abstract:

Osteoarthritis (OA) is the most common joint disease that can cause pain and disability in adults. The main pathological feature of osteoarthritis is cartilage degeneration, which is caused by chondrocyte apoptosis, cartilage matrix degradation, and the destruction of inflammatory factors. Primary cilia are very sensitive to mechanical and physicochemical stimuli, are important structures involved in cell signal transduction, and may play an important role in the development of OA. It has been found that the morphology (location, length, incidence and direction) of the primary cilia of chondrocytes is related to OA, and the relevant signaling pathways in the process of OA can be regulated by the primary cilia. Low intensity pulsed ultrasound (LIPUS) is a commonly used clinical treatment for OA. Studies have found that LIPUS can activate TRPV4, regulate the inward flow of calcium, promote NF- κ B into the nucleus, regulate the transcription of synthetic matrix genes, and play a positive role in OA. This suggests that LIPUS regulates the process of knee osteoarthritis in mice by mediating the TRPV4 channel through primary cilia. At the same time, moderate mechanical stimulation can inhibit the degradation of articular cartilage and apoptosis induced by $il-1\beta$, and moderate mechanical stimulation can affect the process of OA by participating in the regulation of calcium ions through primary cilia. These studies suggest that primary cilia of chondrocytes play an important role in the development of OA and may be a target for intervention.

Biography

Ying Kong has completed his MD at the age of 36 years from Central South University. She is the director of department of Physical Medicine and Rehabilitation Department at the Second Xiangya Hospital, Central South University. She has published more than 10 papers in reputed journals and has been obtained seven fundings supported.