Treatment & Diagnosis of Cartilage Degeneration in Patients with Osteoarthritis

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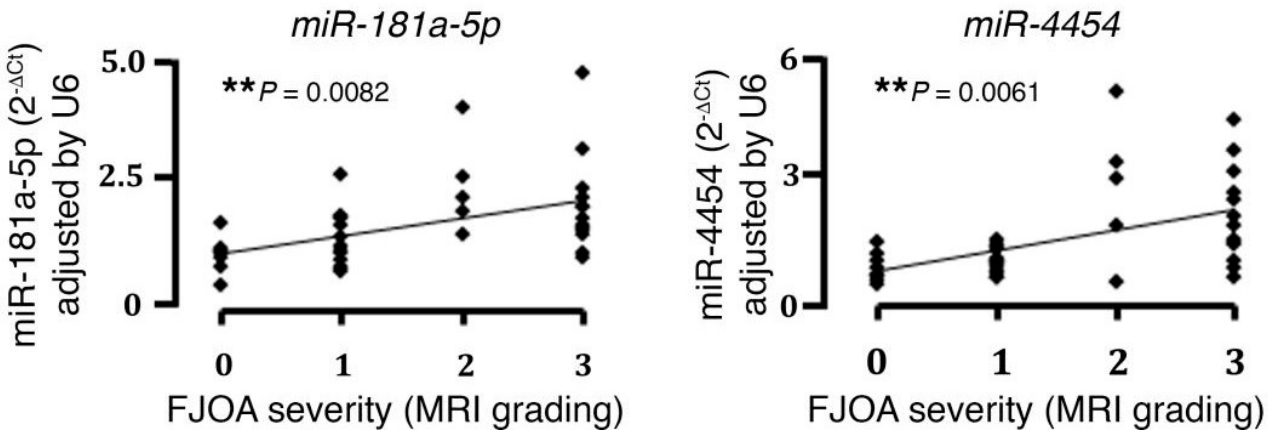
Technology description

A panel of biomarkers upregulated in Facet Joint Osteoarthritis (FJ OA) predicted in disease, two of which are highlighted

Early changes in facet cartilage can provide significant value for initial diagnosis of patients with FJ OA. Currently, there is no diagnostic biomarker method available for this condition. Researchers from University Health Network have discovered 2 differentially expressed miRNAs in early FJ OA. The elevated expression of these biomarkers directly correlates with the disease' s progression (see figure below). Results have been obtained from histological samples of 34 patients with FJ OA and 21 control patients with lumbar disc herniation. The results from an independent ongoing research study on blood samples from 40 patients (with FJ OA severity from 0-3) demonstrated elevated levels of miR-181-5p and miR-4454 and their direct correlation with the disease' s progression.



Correlation between the expression of miR-181-5p or miR-4454 and the severity of FJ OA based on MRI grading. Total 55 patients (21 control and 34 from the FJ OA groups)

In vitro data from cultured facet OA chondrocytes treated with inhibitors of the two microRNAs showed significant downregulation in the expressions of catabolic, inflammatory and cell death markers and significant upregulation in the expression of type II collagen. These results confirm that miR-181-5p or miR-4454 can be possible therapeutic targets for OA therapy.

Publications

A. Nakamura et al. JCI Insight. 4 (2016) e86820.

Application area

Therapeutic application to treat osteoarthritis (OA)
Development of microRNA (miRNA) inhibitors as OA disease modifying therapy

Institution

University Health Network

Inventors

联系我们

叶先生

电 话：021-65679356
手 机：13414935137
邮 箱：yeyingsheng@zf-ym.com