TITLE:

"**Human cartilage-derived chondroprogenitor cells resist terminal differentiation and promote integration of meniscus tissue tears.**"

ABSTRACT:

Meniscus injuries are among the most common orthopaedic injuries. Tears in the inner one-third of the meniscus heal particularly poorly as these injuries present a significant clinical challenge. In the present study we demonstrate that chondroprogenitor cells from healthy human articular cartilage can be used to facilitate successful bridging of inner meniscal tears in a fashion that relies on CXCR4. These cartilage-derived progenitor cells were identified on the basis of having elevated basal expression of chondrogenesis marker Sox-9, compared to BM-MSCs. They also exhibit significantly reduced basal expression of collagen X, which is a marker of terminal chondrocyte differentiation and hypertrophy, compared to BM-MSCs and mature articular chondrocytes. We show that cartilage progenitors are capable of migrating to the area of injury and promoting collagen bridging across inner meniscal tears, while maintaining reduced expression of collagen X. Treatment of these cells with CXCR4 inhibitor AMD3100 disrupted cell localization to area of injury and prevented meniscus tissue bridging.

Investigator Bio. (Brief):

Dr. Chathuraka Jayasuriya is an Assistant Professor of Orthopaedics at Rhode Island Hospital and the Warren Alpert Medical School of Brown University. Dr. Jayasuriya received his Bachelor's degree in Biological Sciences with a concentration in Genetics and Development from Cornell University, Ithaca, NY in 2006. He received his PHD in Biomedical Sciences at Brown University, Providence, RI in 2013. He is a molecular cell biologist by training with a background in molecular genetics and musculoskeletal research. Dr. Jayasuriya's laboratory has two main focuses: (1) improving joint injury repair strategies using native tissue stem cell populations (2) elucidating the molecular mechanisms that promote successful cell-based musculoskeletal tissue repair.