PROJECT RESUME

This is a project which fuses advanced imaging technology with mechanical stress prediction to advance our understanding of bone cartilage crosstalk in osteoarthritis. Sesamoid bones are unique anatomical structures that form within tendons. The patella is the largest sesamoid bone in the body and is a crucial component of healthy knee biomechanics. In our research on osteoarthritis, patellae have also become an excellent osteochondral explant model system. An important aspect of explant tissues is that they can be used in bioreactor systems – which can deliver relevant mechanical stimulus in a lab based setting. Finite element (FE) models have been used to great effect to determine what stresses in the patella should be. Thus the global aim of this project is to develop an FE model of the patella bone to allow prediction of local stresses, in both bone and cartilage, that are generated by mechanical stimulus in a bioreactor system.

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