New model enables analysis of tissue-engineered cartilage in lab by large animal testing

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Researchers have developed a new model to analyze tissue engineered cartilage that allows for the use of a single method to assess functional tissue mechanics in cartilage constructs at all stages of development from the laboratory through large animal testing. This unified approach to soft-tissue modeling, which provides a valuable framework for comparing data across different testing methods and for standardizing mechanical outcomes reporting, is presented in an article in *Tissue Engineering, Part A*.

Gregory Meloni, Robert Mauck, PhD, and coauthors from the Perelman School of Medicine, University of Pennsylvania, Philadelphia VA Medical Center, University of Pennsylvania (Philadelphia), North Carolina State University (Raleigh), University of North Carolina-Chapel Hill, and AO Foundation (Davos, Switzerland), developed a finite element (FE) model based on the NIH-sponsored freeware FEBio that combines the unconfined compression and indentation testing methods commonly used to evaluate the mechanical properties of tissue engineered cartilage developed to treat osteoarthritis.

In the article entitled "Biphasic Finite Element Modeling Reconciles Mechanical Properties of Tissue Engineered Cartilage Constructs Across Testing Platforms," the researchers showed that the measurements of changes in material properties during the maturation of engineered cartilage tissue obtained using an FE model significantly correlated with traditional outcomes measures.

"The capacity to accurately measure cartilage tissue properties at all stages of development enables cause and effect relationships to be established more accurately, ultimately supporting successful tissue growth," says *Tissue Engineering* Co-Editor-in-Chief Peter C. Johnson, MD, Principal, MedSurgPI, LLC and President and CEO, Scintellix,

LLC, Raleigh, NC.

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