Introduction

The Anterior Cruciate Ligament (ACL) is one of the ligaments that provide/restrict proper axial and rotational stability of knee (Figure 1). The menisci are C-shaped fibrocartilage discs found in the knee which provide protection for the cartilage layer within the knee joint (Figure 1). Both the ACL and menisci are essential for proper knee movement and joint health.

Current Results

Scaffolds made from poly(desaminotyroisyl-tyrosine dodecyl ester dodecanoate) (poly(DTD DD)) have shown very good biocompatibility as well as retention of mechanical properties within short term large animal models.

Objective

To develop artificial polymer scaffolds for ACL and meniscus that possess (i) mechanical properties which match that of the original tissue, (ii) biocompatibility including potential to promote cellular growth and regeneration, and (iii) a resorption timeline that allows for the polymer scaffold to degrade/resorb while cellular reconstruction/regeneration takes place.

Current Goals

-To design and produce biocompatible polymer scaffolds with an optimum resorption time with mechanical properties similar to poly(DTD DD).
-To characterize biocompatibility, resorbability, and retention of mechanical properties of these resorbable polymers in vitro and in vivo.
-To further explore biocompatibility, resorbability, and retention of mechanical properties within longer term large animal studies than those performed for poly(DTD DD) fibers so far.

References

4. Pictures were provided by Michael Dunn, Charles Gatt, Nick Tovar, and Eric Balint.

http://arthroscopy.com/sp05001.htm
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