

Osteochondral Transplant System—Week 3, Progress Report

Client: Dr. Brian Walczak

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Problem Statement

Osteochondral allografting is a common procedure performed on patients that require replacement of diseased bone. Current methods of implantation require the application of mechanical forces that have a detrimental effect on the live chondrocytes present on the implant. Maximizing the amount of viable tissue during and after the surgery is a crucial factor for the success of the procedure. Hence, the client requests a delivery system that will reduce the amount of mechanical forces required to securely place the implant into the donor site.

Previous Week's Goals

- Begin to gather tools necessary to extract bone plugs for experimentation ✖
- Consider various combinations of taps and dies that will be necessary for our tentative tests with bone plugs in the 10-20 mm diameter range ✖
- Research tools that can be purchased in a hardware store that will allow us to quickly and efficiently extract bone plugs ✓
- Alternatively, we can begin to consider how we will go about fabricating our own bone extraction device ✓

Summary of Team Accomplishments

- Researched and agreed on at least three different methods to evaluate using a design matrix for chondrocyte viability testing
- Investigated resources that will allow us to use a confocal microscope for future testing
- Proposed a new method for bone plug extraction that relies on a guide and a hole saw

This Week's Goals (Team and Individual)

- Construct a design matrix that evaluates three different methods for chondrocyte viability quantification
- Create a PowerPoint for preliminary presentation
- Use SOLIDWORKS to model the guide part that will be used for bone plug extraction
- Place an order for a trephine part that will be compatible with our guide
- Reserve time slots to receive confocal microscope training
- Edit PDS

Project Difficulties

The butcher shop that provides us with fresh bovine femurs is only able to provide this service on Fridays and the confocal microscope that we hope to use is not available over the weekends. Hence, we currently expect a 3-day gap between when we can obtain the fresh femurs for testing and when we can image our samples. This 3-day gap may result in a large source of error in our imaging results.

Expenses

No expenses to report.

Individual Activity Log

Person	Task	Time (hr)	Weekly Total (hr)	Semester Total (hr)
Rodrigo (Leader)	Weekly progress report	0.5	3.5	9.5
	Adviser meeting	0.5		
	Team meeting	0.5		
	Individual research & work	2		
Eduardo (Communicator)	Team meeting	0.5	3	8
	Adviser meeting	0.5		
	Individual research & work	2		
Nick (BSAC & BWIG)	Adviser meeting	0.5	2	6
	Team Meeting	0.5		
	Individual research & work	1		
Bilin (BPAG)	Adviser Meeting	0.5	3	8
	Team Meeting	0.5		
	Individual research & work	2		

