

Senior Project – BioPrinter

09/18/2012

GOALS FROM LAST WEEK

- Polymer decision : PCL
 - Tests on fibroblast and chondrocytes
 - Temperature parameters
 - Porosity: microCT (?) - ACM image???? From the biology department, look up fixation.
 - Will probably require slicing.
 - Mind and look up thickness
 - Sigma---website – nw 4000 , 100 g for \$ 85
 - How much will actually be needed?

ADVANCES FROM THIS WEEK

- Flasks - plates
 - UpCell-temperature regulated – cells would attach at 37 C
 - Hydrocell – minimized cell attachment \$80
 - LOOK- for non-binding , non-treated – 96 units
 - Although some cells MAY attach, we can work with that
- CAD model and G code that will be broken down layer by layer
 - Sublayers of the scaffold pattern will be integrated a different language which will then go to the main system.
- No shipping with a specific website through Dave
- Cell Deposition
 - Piston attached to a syringe
 - Extruder head temperature range can affect the cells
 - Tests may need to be run in order to see the time for cells
 - Autoclaveable plates, should be sterile
 - Ethanol was used for sterilization - scaffold
 - Maintain sterility throughout centrifugation when getting ethanol out
 - Cells were forced to aggregate – to keep small populations together
 - Depending on the viscosity of PCL – sterile filtering → 0.2 um
- Cross Linking
 - Uv light - favored
 - Would be used before hand
 - How to prevent cytotoxicity – would be used before hand.

- Users should be protected
 - Boxes for crosslinking
 - How would uv irradiate?
 - Y-axis oversized, move out for crosslinking, and then move back
- MSDS for the chemicals that are going to be used by Friday September 21, 2012
 - One electronic, one hard copy
 - Collect as we encounter
- Carriage/Countertop - Electronics
 - Location will be determined in a couple of days
 - Rails are 12 in + 2in max
 - Plastic : Delrin
 - Aluminum 661
 - Sleeve-Bearing Carriages and Guide Rails – Nylon. – \$47.28
 - Step Motor Driver, 3A Max, CW230 - \$48.50
 - Arduino Mega ADK
 - AD590 Series : Solid State Temperature Sensor - \$22

GOALS FOR NEXT WEEK

- VERY IMPORTANT: Diagram for the general system
 - Diagram of every stage
 - How each system connects to another system
- Budget for present materials, this should include
 - Data sheet of each material
 - Summary of highlighted parameters
- Fluid analysis (ANSIS)
- Dimensions of the countertop in order to determine exact location
- Electrical components isolation for humidity control