Individual Design Reports for Weekly Meeting 5

Ultrasound Mediated Tissue Engineering Project
Team 21
Monday, November 12, 2012

Team Members: Nicholas Calistri, Aimon Iftikhar, and Kelly Stratton
TA: Sarah Brittain

Project 40
for
Dr. Yusuf Khan

University of Connecticut Health Center
Department of Orthopaedic Surgery
Department of Chemical, Materials & Biomolecular Engineering
Biomedical Engineering Program
263 Farmington Avenue
Farmington, CT 06030
Phone: (860)-679-4097
This week, we first met with our TA Sarah Brittain and our advisor Dr. Gielo-Perczak. During the meeting, suggestions were given to improve the quality of our final presentations, such as adding more technical detail and adding another SolidWorks simulation. We also needed pictures of the equipment that we are using.

We also completed the second part of the final lab report and handed it in on Wednesday. Additionally, Yvonne and I went to the health center for the entire day on Friday in order to construct scaffolds and test them on the rheometer, shown in Figure 1.

![Rheometer](image)

After constructing the gels, a lot of time was spent trying to learn how to operate the rheometer and play around with the different parameters available. Craig Hanna assisted us with the rheometer and James Veronik helped with the scaffold construction. Six trials were done. The majority of the time was spent trying to understand and operate the machine and so parameters were changed for each trial, but one strain value was found to be the most consistent, and so that is what we will be using for the rest of the time that we complete the tests. Two geometries were used with the rheometer to determine which one would be better and give more consistent results.
The progress made over the course of this week included our weekly meetings with both our teaching assistant, Sarah Brittain, and academic supervisor, Dr. Gielo-Perczak. Throughout this week, we presented a rough draft of our final presentation and spent approximately five and half hours at the Uconn Health Center.

During the meeting, valuable suggestions were given to improve the quality of our final presentations. Such suggestions included adding more technical detail, describe more specifically our model in SolidWorks, and include actual pictures of the equipment we are using. Figure 1 displays the actual rheometer that we will be using in Dr. Khan’s lab.

![Rheometer](Figure 1: Rheometer)

Kelly and I then took the trip to the health center on Friday morning, November 9, 2012, to begin constructing our scaffolds as well as obtain some raw date from the rheometer using these scaffolds. Approximately 8-9 scaffolds were made. The majority of the time after the gels were constructed was learning how to calibrate and obtain information on the rheometer. Six trials were done on the rheometer. Although the data on the rheometer was inconsistent, this could be due to human error and a lack of understanding on the machine. Despite the fact that
more experience with the rheometer will be needed, Kelly and I (along with Jim and Craig’s input) decided on a strain value \( \epsilon \). Assistance with the rheometer was given by Craig Hanna and James Veronik assisted with the gel construction.
This week, we had our weekly team meeting where we presented a rough draft of our final presentation. We were able to gain critique and input on how to improve the final presentation and report. We intend on developing more specifications on our model in SolidWorks. We also want to improve the presentation of the design, and include more technical pictures.

Kelly and Yvonne went to the health center to synthesize the scaffolds. Fortunately, Jim taught us the protocol for making these scaffolds, so they were also able to obtain some data from the rheometer. While this is a start, we intend on working throughout next week on finishing constructing the scaffolds and to move into further testing.

Figure 1: Rheometer