

PRINT-A-PUNCH

Date: September 21, 2024 to September 27, 2024

Client: Prof. Colleen Witzenburg (witzenburg@wisc.edu) and Mr. Daniel Pearce (dppearce@wisc.edu)

Advisor: Dr. Megan Settell - settell@wisc.edu

Daniel Pies - dpies@wisc.edu - Team Leader

Colin Bailey - cgbailey@wisc.edu - Communicator

Kendra Ohde - ohde@wisc.edu - BPAG

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Problem Statement

In order to carry out effective biaxial testing of tissue, a precise, symmetric sample must be cut. A cruciform shaped sample allows this testing to be performed however there are not currently any products that can uniformly cut this type of sample. The goal of this project is to generate a method to use factory produced razor blades to cut small samples of tissue so biaxial tensile testing is effective while keeping the product simple and inexpensive.

Brief Status Update

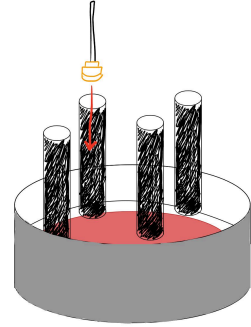
This week we mainly focused on the design matrix as well as finalizing our designs. For the design matrix we selected out top 3 designs which are the Razor 1-step, Razor 2-step, and the Biopsy Jig. When the matrix was created we found that the Biopsy Jig performed the best with a score of 76.5 while the Razor 2-step was the next best at 73 and the Razor 1-step at 66. The Biopsy Jig performed the best on replicability, ease of use, and ease of fabrication. Although, this design did score the lowest on cost due to using a biopsy punch and not only using razor blades. Then our team moved towards focusing on our project presentation which we will be presenting this upcoming week.

Difficulties / Advice Requests

- One challenge the team faced this week was filling out the design matrix. This difficulty was handled by keeping good communication, especially on points we disagreed on.
- A second challenge the team faced this week was planning our client meeting. Since we were working under a relatively tight time constraint, it was difficult for the team to find time where we could all meet with the client, and instead settled on only two team members going in to Mr. Pearce's lab to observe the cutting of the sample.

Current Design

We have chosen the top 3 designs being Razor 1-Step, Razor 2-Step, and the biopsy jig. Although the team has CAD mock-ups of the razor 1 and 2 step designs, we are currently working on finalizing the CAD design. A rough sketch will be included for the time being but will be updated as soon as the CAD design is complete.



Materials and expenses

Item	Description	Manufacturer	Mft Pt#	Vendor	Vendor Cat#	Date	#	Cost Each	Total	Link
Category 1										
									\$0.00	
									\$0.00	
Category 2										
									\$0.00	
									\$0.00	
								TOTAL:	\$0.00	

Major Team Goals For The Next Week

- Work on Project Presentation
- Continue research
- Consider reevaluation of final design, accounting for advice from the client

Next Week's Individual Goals

- Daniel Pies
 - Preliminary report and presentation
 - Continue researching for relevant information to the project
 - Complete CAD sketch of final design
 - Begin prototyping
- Colin Bailey
 - Preliminary report
 - Preliminary presentation
 - Prototyping
- Cole Miller
 - Preliminary report and presentation
 - Choose best design from proposed designs

- Begin work on prototypes
- Emmett Jones
 - Preliminary presentation and report
 - Choose top design
 - Complete revising of chosen idea
 - Begin prototyping
- Kendra Ohde
 - Finalize details of what we need to order: specific razor blades, biopsy punches, 3D print material, etc.
 - Work and practice project presentation

Timeline

Task	September				October				November					December	
	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13
Project R&D															
Empathize															
Background...															
Prototyping															
Testings															
Deliverables															
Progress Reports		X	X	X											
Prelim Presentation															
Final Poster															
Meetings															
Client		X		X											
Advisor	X	X	X	X											
Website															
Update	X	X	X	X											

Filled boxes = projected timeline
 X = task was worked on or completed

Major Team Goals For The Next Week

- Continue basic background research
- Begin working on sketches
- Work on preliminary presentation

Previous Week's Goals and Accomplishments

- Daniel Pies
 - Continue research on relevant topics
 - Materials
 - Tissue thickness for artery samples
 - Current practices

- Organize files and create necessary documents
- Brainstorm potential designs for initial prototype
 - Create CAD mockups
- Meeting with client to get feedback on designs and watch sample cutting
- Colin Bailey
 - Brainstorm potential ideas
 - Plan observation time
 - Design Matrix
- Cole Miller
 - Brainstorm design ideas
 - Attend a demonstration from client of cutting and preparing tissue samples
 - Work on Design Matrix
- Emmett Jones
 - Continue updating website with Progress Report, PDS, and other relevant information
 - Begin rough sketching of preliminary design ideas
 - Continue research to assist with preliminary designs
 - Tissue Mechanics
 - Cruciform shaped tissue samples usage
- Kendra Ohde
 - Continue research
 - Materials
 - Ways to prevent asymmetry by reducing the strain on the tissue
 - Current products used as well as new technologies being developed
 - Look at the finances for the project and create a rough list of things that are necessary for the project
 - Brainstorm potential design ideas

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Team	9/21-9/27	Meeting with client Design matrix meeting	1 1	2	3
Daniel Pies	9/21-9/27	Design matrix team meeting Attend lab client meeting CAD prototyping Research	1 1 2 .5	4.5	11
Colin Bailey	9/21-9/27	Team meeting Work on design matrix	1 .5	3	8.5

		CAD prototyping Plan lab observation time	.5 1		
Emmett Jones	9/21-9/27	Work on design matrix and report Brainstorm possible designs Attend Advisor Meeting	1 1 .5	2.5	7.5
Cole Miller	9/21-9/27	Team Meeting Attend lab observation Attend BSAC Meeting Work on Design Matrix	1 1 1 .5	3.5	8.5
Kendra Ohde	9/21-9/27	Work on designs finalizing details Work on design matrix Work on design matrix report Research materials cost based on each design Attend BPAG meeting	3	3	8
			Total		30