

PRINT-A-PUNCH

Date: October 5, 2024 to October 11, 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

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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

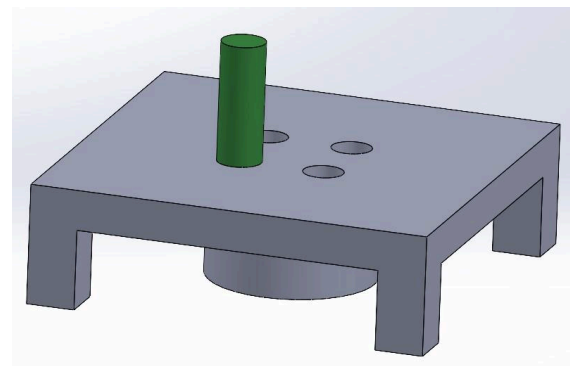
The team is currently working on prototyping several models with slight modifications to present to the client at a later date for feedback. These designs are to be made of an inexpensive PLA plastic, so that minor changes can be made before reprinting.

Difficulties / Advice Requests

- One difficulty the team encountered this week was time management on the preliminary report, as team members had other obligations consuming a lot of time, making it difficult to find time to meet as a team to discuss the report.

Current Design

We have chosen to pursue the biopsy jig design, as pictured in the figure to the right. This design utilizes four pre-cut symmetric holes to ensure consistent geometry, as well as a sample-holding cylindrical base on the bottom.



Materials and expenses

Item	Description	Manufac-turer	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

- Being preliminary prototyping
- Make minor changes and gain client feedback on prototypes

Next Week's Individual Goals

- Daniel Pies
 - Print 2-3 preliminary prototypes from TeamLab using inexpensive materials
 - Extend research to material types such as plastics and resins
 - Begin testing prototypes for consistency
- Colin Bailey
 - Print prototypes at Design innovation center at Wendt
 - Begin formulating testing procedures for evaluating tissue samples
 - Create SOP for creating punch free hand and with jig
 - Continue research where necessary
- Cole Miller
 - Assist with production of prototypes
 - Test different materials
 - Analyze results of prototypes for possible design changes
- Emmett Jones
 - Continue using CAD for possible prototypes
 - Print various types of prototypes using 3D printers
 - Continue researching materials where necessary
 - Continue updating website
 - Begin testing the prototypes accuracy
- Kendra Ohde

- Look into testing method criteria.
- Work on preliminary report
- Test prototypes

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	X	X	X												
Background...		X	X	X	X	X									
Prototyping						X									
Testings															
Deliverables															
Progress Reports		X	X	X	X	X									
Prelim Presentation					X										
Final Poster															
Meetings															
Client		X		X											
Advisor	X	X	X	X	X										
Website															
Update	X	X	X	X	X	X									

Filled boxes = projected timeline

X = task was worked on or completed

Major Team Goals For The Previous Week

- Complete preliminary report
- Complete progress report
- Complete CAD designs for several preliminary prototypes

Previous Week's Goals and Accomplishments

- Daniel Pies
 - Created progress report
 - Created preliminary report
 - Finish CAD models for preliminary prototypes
 - Present preliminary presentation
 - Continued materials research
- Colin Bailey

- Preliminary presentation
- Completed preliminary report
- Continued developing final design
- Cole Miller
 - Completed preliminary presentation
 - Presented preliminary presentation
 - Completed preliminary report
- Emmett Jones
 - Posted new resources on website
 - Completed preliminary presentation and report
 - Continue research and design brainstorming
- Kendra Ohde
 - Completed preliminary presentation
 - Completed preliminary report
 - Look into testing method criteria.
 - Work on preliminary report

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Team	10/5-10/11	Preliminary Presentation	.5	.5	6
Daniel Pies	10/5-10/11	Progress report Preliminary report CAD modeling Preliminary presentation Materials research	.5 1.5 1 .5 .5	4	18.5
Colin Bailey	10/5-10/11	Preliminary presentation Completed preliminary report Continued developing final design 3D printing research	1 2 1 0.5	3.5	15
Emmett Jones	10/5-10/11	Preliminary Report Design prototyping Update Website and Submissions	2.5 -.5 -.5	3.5	14

Cole Miller	10/5-10/11	Preliminary Report Presentation Attend BSAC Meeting	1.5 .5 1	3	15
Kendra Ohde	10/5-10/11	Preliminary Report Presentation Research	3	3	14
			Total	17.5	76.5