

# **Improving the precision of small human tissue biopsy processing**

Date: 12/4/25 - 12/10/25

Client: Dr. Angela Gibson

Advisor: Dr. Tracy Jane Puccinelli

Team:

Ruhi Nagarkatte (Team Leader)

Ella Lang (Communicator)

Gianna Inga (BSAC)

Simon Nam (BWIG)

Sarah Raubenstine (BPAG)

Grace Spiegelhoff (Med Tech)

## **Problem Statement**

In the treatment of extensive burns or wounds, patients rely on emerging treatment research in the field of tissue growth and healing. Currently, studies into the healing properties of porcine skin are conducted to visualize how viable epidermis cells migrate over the site of the wound to promote cell regrowth. However, once in a culture, the porcine tissue samples cannot remain viable unless all fat is removed and the cells are able to absorb the culture media. Additionally, this process of creating samples is not standardized, resulting in samples of varying sizes with jagged edges, which limits the efficiency of sample preparation. To solve this, fabricating a tool that incorporates multiple sample slots, with uniform sizing, and a fixed blade will help to streamline research efficiency and produce more viable samples that can be successfully imaged.

## **Brief Status Update**

The team has successfully completed all final iterations of the device and deliverables for the semester. The team will meet with the clients one additional time, on 12/11/25, to present the final poster and wrap up the last parts of the design.

## **Summary of Weekly Team Member Design Accomplishments**

- Team
  - Scheduled final meeting with client to discuss further feedback of the latest design and next semester future work
  - Received PLA 3D print from the D.I lab with new modifications
  - Completed the final report with all the necessary updates and progress made on project
- Ruhi Nagarkatte
  - Divided up and completed assigned portion final report and poster presentation

- o Updated design notebook (LabArchives)
- Ella Lang
  - o Completed assigned portion of final report and poster presentation
  - o Update necessary portions of the lab archives team notebook
  - o Scheduled and confirmed the meeting with the clients
- Gianna Inga
  - o Completed assigned portion of final report and poster presentation
  - o Completed assigned portion of outreach draft
  - o Update necessary portions of the lab archives team notebook
  - o Updated CAD drawings to implement changes requested by client
  - o Designed a handle for #10 surgical blade
- Simon Nam
  - o Completed assigned portion of final report and poster presentation
  - o Updated all the fabrication, design testing, results in the lab archives team notebook
  - o Finalized and wrapped up our [project page](#) in the BME website
  - o Obtained a new artificial skin layer to be used for future device usability testing
- Sarah Raubenstine
  - o Completed assigned portion of final report and poster presentation
  - o Update necessary portions of the lab archives team notebook

## Weekly/Ongoing Difficulties

There are no ongoing difficulties facing the team this week. All iterations have been completed for the semester and are being prepared to hand off to the client. At the last meeting, the team will return all materials and discuss the timeline for next semester.

## Upcoming Team and Individual Goals

- Team
  - o Present a separated final poster presentation to the client (12/11)
  - o Hand off final design, materials, and deliverables (12/11)
  - o Discuss potential future goals with client for next semester
- Ruhi Nagarkatte
  - o Present final poster to Dr. Gibson
  - o Meet with clients to discuss next steps for testing over winter break
  - o Prepare and transport materials to client for further evaluation
- Ella Lang
  - o Present final poster to Dr. Gibson
  - o Meet with clients to discuss next steps for testing over winter break

- o Organize prototype handoff to client for further evaluation
- Gianna Inga
  - o Present final poster to Dr. Gibson
  - o Meet with clients to discuss next steps for testing over winter break
  - o Prepare and transport materials to client for further evaluation
- Simon Nam
  - o Reach out to client after returning back after new year (~Jan 6th) in case needed for further updates or feedbacks regarding design matter
  - o 3D print additional materials as needed before the semester based on clients' immediate requests
- Sarah Raubenstine
  - o Present final poster to Dr. Gibson
  - o Meet with clients to discuss next steps for testing over winter break
  - o Prepare and transport materials to client for further evaluation

## Project Timeline

Project Goal	Deadline	Team Assigned	Progress	Completed
Product Design Specification First Draft	Thursday, 09/18/2025	All	100%	X
Design Matrix Design Ideas	Friday, 09/26/2025	All	100%	X
Preliminary Presentations	Friday, 10/03/2025	All	100%	X
Preliminary Deliverables	Wednesday, 10/08/2025	All	100%	X
Show and Tell	Friday, 10/31/2025	All	100%	X
Poster Presentations	Friday, 12/05/2025	All	100%	X
Final Deliverables	Wednesday, 12/10/2025	All	100%	X

## Materials and Expenses

Item	Description	Manufacturer	Mft Pt#	Vendor	Vendor Cat#	Date	QTY	Cost Each	Total	Link
PLA	3D printed polymer through BME design Makerspace budget	Makerspace	N/A	UW-Madison	N/A	9/26/25	1	\$5.00	\$5.00	N/A
PLA	3D printed polymer through BME design	Makerspace	N/A	UW-Madison	N/A	10/16/25	1	\$1.20	\$1.20	N/A

	Makerspace budget									
Rubber Slab	12 in x 12 in sheet of 50A black rubber	Grainger Vendor	605 0-1/2A	Grainger	848EH8	10/31/25	1	\$49.99	\$49.99	<a href="https://www.grainger.com/product/Rubber-Sheet-Commercial-Grade-848EH8">https://www.grainger.com/product/Rubber-Sheet-Commercial-Grade-848EH8</a>
Glo Germ Gel - White	Gel used to investigate thoroughness of surface cleaning.	Glo Germ	GEL	Avantor Science Central	470100-620	11/7/25	1	\$25.75	\$25.75	<a href="https://www.avantorsciences.com/us/en/product/8875880/glo-germ">https://www.avantorsciences.com/us/en/product/8875880/glo-germ</a>
PLA	3D printed polymer through BME design Makerspace budget	Makerspace	N/A	UW-Madison	N/A	11/18/25	1	\$1.84	\$1.84	N/A
PLA	3D printed polymer through BME design Makerspace budget	Makerspace	N/A	UW-Madison	N/A	11/25/25	1	\$1.79	\$1.79	N/A
Nylon	3D printed polymer through BME design Makerspace budget	Makerspace	N/A	UW-Madison	N/A	11/28/25	1	\$21.00	\$21.00	N/A
Nylon	3D printed polymer through BME design	Makerspace	N/A	UW-Madison	N/A	12/3/25	1	\$19.50	\$19.50	N/A

	Makerspace budget									
PLA	3D printed polymer through BME design Makerspace budget	Makerspace	N/A	UW-Madison		12/10/25	1	\$3.08	\$3.08	N/A
								<b>TOTAL:</b>	\$129.15	