

Improving the precision of small human tissue biopsy processing

Date: 1/28/26 - 2/4/26

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)

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 met with the client on Monday, February 2nd to discuss the results of the testing they conducted with the newest iteration of the biopsy press that was provided to them over winter break. Some of the challenges the team needs to focus on are cutting down to one well to process one sample at a time, increasing the diameter of the well, using nylon for longevity, and adjusting the blade handle for a better fit. Additionally, the team established goals for the near future and summarized them in the preliminary presentation.

Summary of Weekly Team Member Design Accomplishments

- Team
 - Met with the client to discuss results and feedback from the latest iteration
 - Completed & practiced the preliminary presentation for Thursday, 2/5
 - Set up meeting with Grace to discuss future goals for the semester
 - Continued research on sanitization
- Ruhi Nagarkatte
 - Attended client meeting to receive feedback on the design
 - Completed assigned portion of the preliminary presentation

- o Set up the meeting with Grace to discuss future goals for the semester
- Ella Lang
 - o Went to the client meeting and set design goals for the semester
 - o Worked on the preliminary presentation
 - o Researched material sanitization methods and best practices
- Gianna Inga
 - o Met with client to discuss design feedback
 - o Researched packing materials utilized for reusable medical devices
 - o Completed packaging part of preliminary presentation
- Simon Nam
 - o Attended client meeting to receive feedback & further plannings for testing
 - o Completed assigned portions of the preliminary presentation
 - o Researched further on interaction & compatibility of scalpel blades with PLA | Nylon to focus on durability/stability of the design composition
- Sarah Raubenstine
 - o Attended client meeting and took meeting minutes on feedback and semester goals
 - o Completed assigned portions of the preliminary presentation
 - o Met with team and TECH to discuss future project goals and practice presentation

Weekly/Ongoing Difficulties

The team is preparing for their preliminary presentation with their advisor on 2/5/2026. The client mentioned two upcoming tissue collections on February 19th and 26th; the team could attend this to get a better understanding and feel for the porcine skin. Additionally, the team will meet with their Med Tech, Grace, to update her on all of the progress made and goals for the upcoming semester. Lastly, adjustments will be made to the design based on feedback received from the client, and a new iteration will be printed by the end of next week.

Upcoming Team and Individual Goals

- Team
 - o Present preliminary presentation to advisor on Thursday, 2/5
 - o Meet with Grace to update her on progress made and established goals
 - o Coordinate the visit to the client on the tissue collection days
 - o Start consolidating research and resources from the client for the journal article
- Ruhi Nagarkatte
 - o Help update and print the new design based on the feedback
 - o Finalize the journal to publish the article to
 - o Gather research and images for the journal article
- Ella Lang
 - o Continue research into new material selection
 - o Prepare materials for the journal article
 - o Plan a time for the team to test with the porcine tissue in the client's lab

- Gianna Inga
 - Continue to research, specifically example articles on possible publishing websites
 - Modify design based on client feedback
 - Print modified design
- Simon Nam
 - Look further into process of publishing the journal article and discuss further plannings of drafting with team
 - Schedule a visit with the clients to further collect and analyze samples through design usage
 - Investigate further into IP processing
- Sarah Raubenstine
 - Help modify the current design based on client feedback
 - Select a journal and gather research for use in the journal article
 - Present preliminary presentation and gather feedback on semester goals

Project Timeline

Project Goal	Deadline	Team Assigned	Progress	Completed
Preliminary Oral Presentation	Friday, 02/06/2026	All	100%	X
Preliminary Deliverables	Wednesday, 02/25/2026	All	0%	
Show and Tell	Friday, 03/20/2026	All	0%	
Executive Summary Draft	Friday, 04/03/2026	All	0%	
Executive Summary Final	Friday, 04/17/2026	All	0%	
Poster Presentations	Friday, 04/24/2026	All	0%	
Final Deliverables	Wednesday, 04/29/2026	All	0%	

Materials and Expenses

[illegible]

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