

Improving the precision of small human tissue biopsy processing

Date: 1/22/26-1/29/26

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 is renewing the project: Improving the precision of small human tissue biopsy processing for the 2026 Spring semester. The team plans to meet with the client on February 2nd, 2026, and has scheduled a weekly meeting with their advisor on Thursdays. Currently, the team is awaiting design feedback from the client regarding the testing they performed over winter break. This feedback will guide the team's semester goals and design plans. Additionally, the team is conducting research into some improvement areas discussed at the end of last semester, such as sterilization.

Summary of Weekly Team Member Design Accomplishments

- Team
 - Arrange and scheduled a time to meet with client (Feb 2nd)
 - Team meeting to discuss plans moving onwards for updating design
- Ruhi Nagarkatte
 - Setup new design notebook
 - Met with team to set and discuss semester goals
 - Conducted research on market forecast for biopsy devices

- Ella Lang
 - Arranged a time to meet with our client via email
 - Met with the team to discuss semester goals
 - Did research on sterilization methods and ways to improve our device
- Gianna Inga
 - Met with team & advisor to discuss goals for the semester
 - Took notes on advisor presentation
 - Documented tolerances of PLA and Nylon 12 for fabrication transition between the materials
- Simon Nam
 - Updated the project page on BME design website
 - Researched further on material property for PLA regarding interaction with tissue samples
 - Met with team to discuss and set stages for deliverables
- Sarah Raubenstine
 - Met with team and advisor to go over the goals for this semester
 - Took meeting notes on journal article from advisor meeting
 - Researched PLA limitations in medicine and ways of assessing tissue viability

Weekly/Ongoing Difficulties

Currently, we are awaiting our meeting with the client, planned for next Monday, February 2nd. During that meeting, we plan to get a better idea of ways we can improve the design. This will provide the framework needed to set design goals and plan a project timeline.

Upcoming Team and Individual Goals

- Team
 - Continue working on the design modifications
- Ruhi Nagarkatte
 - Meet with client to discuss feedback and establish new goals for the semester
 - Continue researching and modifying the design based on design feedback
 - Divide up and finish individual portion of preliminary presentation
- Ella Lang
 - Meet with the client to discuss improvements and results from their continued testing over winter break
 - Continue research based on design feedback
 - Work on the presentation for our advisor meeting next week
- Gianna Inga
 - Review the design and ensure individual parts can interact
 - Meet with client to discuss how usage of the device went
 - Work on preliminary presentation
- Simon Nam

- o Meet with client and discuss future design improvements as needed
- o Work with team to continue working on design iterations
- Sarah Raubenstine
 - o Meet with the client to discuss any data collected over break
 - o Meet with team to discuss goals for the semester based on client feedback
 - o Prepare goals presentation for upcoming advisor meeting

Project Timeline

Project Goal	Deadline	Team Assigned	Progress	Completed
Preliminary Oral Presentation	Friday, 02/06/2026	All	20%	
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