

Improving the precision of small human tissue biopsy processing

Date: 9/4/25-9/11/25

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)

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 established communication with both their advisor and client to utilize throughout the semester. They came up with questions to prepare for the client to better understand the goals of the project. Future meetings were set up with the client and advisor to keep them informed and report on the progress of the design. Research was begun to gather information to build foundational knowledge of the project.

Summary of Weekly Team Member Design Accomplishments

- Team
 - Met with advisor
 - Established future meeting times
 - Generated questions to ask the client
 - Established communication with the client
 - Met with the client
 - Established future meeting times
- Ruhi Nagarkatte
 - Set up team, advisor, and client meeting times
 - Met with advisor and client

- o Set up team information in design notebook
 - o Conducted preliminary research on current techniques, materials, and reviewed the given presentation and photos
- Ella Lang
 - o Met with advisor and client
 - o Outlined and wrote the Problem Statement
 - o Established contact with the client and updated them on presentation dates, the team website, and weekly progress reports
 - o Reviewed the provided slideshow that will guide our design work and preliminary research
- Gianna Inga
 - o Met with advisor and client
 - o Updated brief status update
 - o Generated questions to ask client
 - o Signed up to be a bme mentor
 - o Started preliminary research for materials and the mechanical properties of pig skin
- Simon Nam
 - o Met with advisor
 - Specifically gave general information about the project coursework/flow
 - o Generated questions to ask to client(s) prior to meeting with following the contents of PDS
 - o Updated the project page with problem statement, description, team name, progress report for Week 2
 - o Initiated research on biopsy tools
- Sarah Raubenstine
 - o Met with advisor to discuss project meeting times and the upcoming semester
 - o Collaborated on list of questions to ask the client during initial meeting
 - o Met with client and took down meeting notes
 - o Began researching pig skin studies and different biopsy tools

Weekly/Ongoing Difficulties

There are no ongoing difficulties facing the team this week. In the next week, the team is hoping to conduct enough research to draft a Product Design Specifications (PDS) and start brainstorming potential solutions.

Upcoming Team and Individual Goals

- Team
 - o Update client's initial information and design specification needs to advisor and begin working on the drafting of PDS
- Ruhi Nagarkatte
 - o Divide PDS among team members, complete assigned portion

- o Conduct more research on competing designs and physiology of cell culture
 - o Update design notebook as needed
- Ella Lang
 - o Research more about porcine tissue, biopsies, and wound healing
 - o Send out the progress report
 - o Begin working on the PDS
- Gianna Inga
 - o Document research in team notebook
 - o Work on individual portion of PDS
 - o Attend BSAC meeting
 - o Reach out to assigned BME mentee
- Simon Nam
 - o Research more on specific cutting devices, materials for pig skins
 - o Begin drafting for PDS
 - o BME Outreach seminar document completion
 - o Update design page with PDS and reach out to assigned BME mentee if needed
- Sarah Raubenstine
 - o Continue to research tissue background and competing designs
 - o Update team and advisor meeting notes in team notebook
 - o Complete assigned portion of the PDS

Project Timeline

Project Goal	Deadline	Team Assigned	Progress	Completed
Product Design Specification First Draft	Thursday, 09/18/2025	All	0%	
Design Matrix Design Ideas	Friday, 09/26/2025	All	0%	
Preliminary Presentations	Friday, 10/03/2025	All	0%	
Preliminary Deliverables	Wednesday, 10/08/2025	All	0%	
Show and Tell	Friday, 10/31/2025	All	0%	
Poster Presentations	Friday, 12/05/2025	All	0%	
Final Deliverables	Wednesday, 12/10/2025	All	0%	

Materials and Expenses

Item	Description	Manufacturer	Mft Pt#	Vendor	Vendor Cat#	Date	QTY	Cost Each	Total	Link
Component 1										

							TOTAL:			