

Healing In Alignment: Bioelectric Dressing for Collagen Alignment

Progress Report #1

Date: 09/10/2026

Client: Dr. Jasmine Craig

Advisor: Professor Amit Nimunkar

Team:

Anya Bergman
Ellinore Letts
Shashandra Suresh
Callum Brown
Claire Neemann

Problem statement

Keloids are a form of dermal scarring that is caused by excessive fibroblast proliferation, and excessive extracellular matrix formation. These scars grow gradually and extend beyond the initial wound margins. Treatments such as occlusive dressings, compressive therapy, steroid and topical therapy aim to modulate the wound healing process, but have variable efficacy, require prolonged patient compliance and often have undesirable side effects. The goal of this project is to create a bioelectric dressing that would apply an exogenous electrical stimulus in order to directly affect galvanotaxis within the wound healing process. Current research has demonstrated that an externally applied, low intensity electric field can modulate fibroblast orientation, reduce excessive collagen deposition and promote a more organized ECM architecture, ultimately stimulating healing on the cellular level during early stages of wound regeneration.

Brief status update

The project is in the literature research phase. We are researching vital aspects of our project and competing designs. We plan to meet our advisor soon to discuss further actions.

Difficulties / advice requests

No difficulties currently in this stage of the design process.

Current design

The team is in the early stages of research. No design ideas have been created currently.

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	

*Meeting with client needed before materials and expenses can be discussed

Goals

Major team goals for the next week

1. Work on the Product Design Specification in order to gain a fuller understanding of what our design needs to accomplish.
2. Outline goal and plan for the project with a timeline.

Next week's individual goals

- Anya Bergman
 - Work on Product Design Specification
 - Research more physiological causes for keloids
 - Begin design matrix for future direction of the circuit
- Ellinore Letts
 - Generate questions on current testing for client meeting
 - Research cell lines and required reagents
- Shashandra Suresh
 - Work on Product Design Specification
 - Research more competing designs/materials
 - Meet client and previous team to discuss short-term and long-term project goals
- Callum Brown
 - PDS
 - "Catch up" to S26 team through client meeting and notebook review
- Claire Nesemann
 - Discuss requirements and visions with client and start to develop design ideas
 - PDS development

Timeline

Task	Sep				Oct					Nove				Dec	
	4	11	18	25	1	8	15	22	29	5	12	19	26	3	10
Project R&D															
Empathize															
Background...															
Prototyping															
Testings															
Deliverables															
Progress Reports															
Prelim presentation															
Final Poster															
Meetings															
Client															
Advisor															
Website															
Update															

Filled boxes = projected timeline

X = task was worked on or completed

Detailed accomplishments

Previous week's goals and accomplishments

- Anya Bergman
 - Researched keloid etiology, and endogenous electric fields that are intrinsic to wounds.
 - Looked through past project work to identify potential next steps.
- Ellinore Letts
 - Researched in vitro keloid modeling techniques
 - Researched testing protocols for keloid spheroid models
- Shashandra Suresh
 - Constructed emails to client and previous team and set up meetings
 - Researched keloids and both traditional and newer forms of treatment
- Callum Brown
 - Reviewed past teams notebook for context
 - Preliminary research on keloid pathophysiology and the effect of electric stimulus on wound healing
- Claire Nesemann
 - Review previous groups work (LabArchives)
 - Research keloids and basics of bioelectric dressings

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Anya Bergman	9/04 9/10	Set up the team notebook, and drive Research	0.5 1.5	2	2
Ellinore Letts	9/04-9/09	Research	2	2	2
Shashandra Suresh	09/04 09/09	Constructed emails Research	0.5 1.5	2	2
Callum Brown	9/9 9/10	Review past teams notebook Background research	2	2	2
Claire Nesemann	9/9 9/10	Review previous project work Research keloids and basics of bioelectric dressings	1 1	2	2