

BME Design: Progress reports

Title: Microvascular Channel Bioprinter shutoff valve

Date: 19 March 2026

Client: Dr. David Dean

Advisor: Dr. Paul Campagnola

Team:

- Dominique Gooden - *Co Team Leader*
- Steph Vigmond - *Communicator*
- Mahathi Karthikeyan - *formerly BSAC; now Co-Team Leader*
- Sophie Speece - *BWIG*
- Ana Toscano - *BPAG*

Problem statement

Facilitate rapid switching between bioprinter input devices so that microchannels have rapidly decreasing diameter. Also come up with a shutoff mechanism to prevent excess fluid flow from valves.

Brief status update

Difficulties / advice requests

N/A

Current design

See design matrix. In progress.

Materials and expenses

Item	Description	Manufac-turer	Mft Pt#	Vendor	Vendor Cat#	Date	#	Cost Each	Total	Link
------	-------------	---------------	---------	--------	-------------	------	---	-----------	-------	------

Category 1										
	Flexible 80A IRE print					2/18/26	1	3.06	\$3.06	
	CEVIC locking mechanism					2/18/26	1	0.32	\$0.32	
	CEVIC locking mech - updated					2/19/26	1	0.24	\$0.24	
	Updated servo & CEVIC holder					2/26/26	1	0.15	\$0.15	
	Clip and Gear					3/17*26	1	0.13	\$0.13	
	Small KSMs					3/17/26	1	4.00	\$4.00	
	CEVIC Servo Connector with tapped holes					3/18/26	1	0.18	\$0.18	
Category 2										
									\$0.00	
									\$0.00	
								TOTAL:	\$7.90	

Major team goals for the next week

Next week's individual goals

- Dominique
 - Implement revised electronics solutions into current frameworks
- Ana
 - Data analysis for integration test
- Sophie
 - Integrate all parts of the prototype and confirm that everything fits together
- Steph
 - Work on integration testing
 - Update IRE model
- Mahathi
 - Gather results and analyze them for the electronics testing and plan integration testing.

Timeline

Task	Jan	February				March				April					May
	29	5	12	19	26	5	12	19	26	2	9	16	23	30	7
Project R&D															
Empathize															

Background...	X	X													
Prototyping															
Testings					X	X	X								
Deliverables															
Progress Reports	X	X	X	X	X	X	X								
Prelim presentation		X													
Final Poster															
Meetings															
Client		X		X											
Advisor	x	X	X	X	X										
Website															
Update	X	X	X												

Filled boxes = projected timeline
 X = task was worked on or completed

Previous week's goals and accomplishments

- Ana
 - Electronics testing
 - Revised the circuit diagram
- Dominique
 - Electronics testing with Mahathi
 - Researched electronics improvements (circuitry) based on last week's electronics testing
- Steph
 - Leak & functionality testing
- Sophie
 - Leak and functionality testing
 - Designed clip to keep motor in place
 - Designed new CEVIC-Servo connector with tapped holes to allow for Voron/linear actuator attachment
 - Modeled new gear with better interface with IRE
- Mahathi
 - Electronics testing and revised protocol
 - Revised the code for integration testing

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Mahathi	3/13 3/15	Revised code, testing Research on circuit design	2 1	2 1	12
Steph	3/18	Leak & functionality testing with Sophie	2	2	21.5
Dominique	3/13 3/14, 3/18	Electronics testing with Mahathi Research	2 1	3	>10

Sophie	3/15 3/16 3/17 3/18 3/19	3D modelling Servo-CEVIC clip 3D modelling modelling new gear 3D modelling Servo-Cevic connector with attachment point for Voron/linear actuator Leak testing using syringe pump IRE dremmeling	1 1 1 2 0.5	4.5	21
Ana	3/19	revised the circuit diagram, code and circuit for testing			