

BME Design: Progress reports

Title: Microvascular Channel Bioprinter shutoff valve

Date: 23 October 2025

Client: Dr. David Dean

Advisor: Dr. Paul Campagnola

Team:

- Dominique Gooden - *Team Leader*
- Steph Vigmond - *Communicator*
- Mahathi Karthikeyan - *BSAC*
- 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

The two sub teams continue to meet and work towards individual goals. This weeks goals revolve around preparing a rudimentary prototype to bring to the Show and Tell deliverable.

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										
	3D Printed CEVIK & 5 KSMs	N/A (3D Printed)	N/A	N/A	N/A	09/19	1		\$3.48	
	3D Printed CEVIC and 8 KSMs					10/20	1		\$12.60	
Category 2										
									\$0.00	
									\$0.00	
								TOTAL:	\$16.08	

Major team goals for the next week

Next week's individual goals

- Dominique
 - Print tubing holder
 - Conduct preliminary compression tests using materials we have
- Ana
 - Help print the tubing holder for show and tell
 - Continue research
 - Work on demonstration simulation
- Sophie
 - Complete a rudimentary prototype of the IRE motorized for show and tell
 - Continue work on CFD
- Steph
 - Work on a working prototype for IRE design
 - Continue modeling CEVIC
 - Continue research
- Mahathi
 - Look up arduino code for servo motors
 - For alternate valve look up labview compatibility

Timeline

Task	Aug	September				October					November				Dec	
	26	4	11	18	25	2	9	16	23	30	6	13	20	27	4	11
Project R&D																
Empathize																
Background...					X											
Prototyping					X			X	X							
Testings							X									

Deliverables																
Progress Reports		X	X	X	X	X	X	X	X							
Prelim presentation						X										
Final Poster																
Meetings																
Client			X	X	X	X	X	X								
Advisor		X	X	X	X		X									
Website																
Update		X	X	X	X	X	X	X								

Filled boxes = projected timeline

X = task was worked on or completed

Previous week's goals and accomplishments

- Ana
 - Worked on simulation
 - Worked on research
 - Worked on setting up account for client
- Dominique
 - See below
- Steph
 - Worked on SOLIDWORKS model
 - Worked on research
- Sophia Speece
 - Modeled IRE in SolidWorks
 - Continued CFD modeling
 - Printed another set of CEVIC and KSMs
- Mahathi
 - Researched pinch valves for a price that could work with our CEVIC device
 - Met with team and discussed potentially using servo motors

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Mahathi	10/17 10/21	Worked on Labview documentation Researched cheaper valves that can automated	3 2	5	20
Steph	10/18 10/21 10/23	- Worked on a SOLIDWORKS model of CEVIC - Continued working on SOLIDWORKS - Consult with Jesse in lab & further model work	3 1.5 2	6.5	23.5
Dominique	10/18/25	Created a hybrid design idea for a valve shutoff mechanism	1.5	4.5	>10

	10/18/25 10/18/25 10/22/25	Learned about servo motor design and integration in design idea Constructed a tubing holder prototype (on solidworks) for testing 2 more shutoff mechanisms on solidworks Team meeting	.5 1.5 1		
Sophie	10/18 10/21 10/22	Modeled IRE in SolidWorks ANSYS Fluent tutorials Team meeting	1 0.5 1	2.5	19.5
Ana	10/22/2025	Worked on simulation Worked on research Worked on setting up account for client	1.5 1 0.5	3	21.5