BME Design: Progress reports

Title: Microvascular Channel Bioprinter shutoff valve

Date: 16 Oct. 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

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	
									$0.00	
Category 2										
									$0.00	
									$0.00	
								TOTAL:	**$3.48**	

Major team goals for the next week

Next week's individual goals

- Dominique
  - Work on Solidworks designs for design idea 2 and learn about servo motors
- Ana
  - Work on a testing protocol using the simulation
  - Complete a more challenging ANSYS Fluent simulation
  - Research more on applications of Fluent
- Sophie
  - Passage cells again
  - Complete a more challenging ANSYS Fluent simulation
  - Print additional KSMs and two halves of CEVIC
- Steph
  - 3D print another CEVIC and separated CEVIC
  - Work on potential Solidworks designs for rotating design
- Mahathi
  - Relearn LabView and learn tutorials
  - Meet with valve group and start prototype

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											
Testings																
Deliverables																

BME Design: 200, 300, 301, 400 and 402

Progress Reports		X	X	X	X											
Prelim presentation																
Final Poster																
Meetings																
Client			X	X	X											
Advisor		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
  - Completed assigned sections of Preliminary report
  - Met with Computational Fluid Dynamics team member and create action items for CFD team
  - Watch an ANSYS Fluent tutorial
  - Set up client account for ordering materials
- Dominique
  - Researched valves to present to Josh
  - Coordinated a progress plan for the valve team
- Steph
  - Completed assigned sections of Preliminary report & helped edit
  - Researched potential supplies needed for prototyping
- Sophia Speece
  - Passaged cells to keep alive for future cytotoxicity testing
  - Complete assigned sections of the Preliminary Report
    - Materials
    - Methods
    - Testing
  - Go through the preliminary report once all team members are done to confirm formatting and insert bibliography
  - Met with Computational Fluid Dynamics team member (Ana Toscano) and create action items for CFD team
  - Watch an ANSYS Fluent tutorial
  - Create a simple, one way flow Computational Fluid Dynamics model using either Fluent or Solidworks Flow
- Mahathi
  - Completed assigned portion of preliminary report (Background)
  - Did research on how LABVIEW can be used on pumps and completed more background research

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Mahathi		-Preliminary report and design research	5	5	16

BME Design: 200, 300, 301, 400 and 402

Steph	10/13 10/16	Worked on preliminary report - personal section & editing Research potential materials that are needed - clamps, rotary elements, etc.	1 2	3	17
Dominique	10/16 10/14	Researched Valves Worked on assigned section of prelim report	3	3	>10
Sophie	10/09 10/10 10/12 10/14	Met with CFD Team Passage cells to use for future cytotoxicity testing Completed assigned sections of preliminary report Revised preliminary report, adding abstract and conclusion sections, and inserting bibliography	0.5 0.5 2 2	 5	 17
Ana	10/08	Worked on the preliminary report Worked on Fluid Simulation using software Worked on setting up client account	2 1 0.5	2 1 0.5	18.5