

BME Design: Progress reports

Title: Microvascular Channel Bioprinter shutoff valve

Date: 26 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
 - Continue design idea to help with syringe pullback mechanism on solidworks
 - Conduct integration testing with team
- Ana
 - Work on executive summary
 - Start on poster for final presentation
- Sophie
 - Complete integration testing
 - Continue to improve CEVIC-Servo holder
- Steph
 - Work on executive summary
 - Gather results from testing
- Mahathi
 - Gather results and finish 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
 - Filled form for purchase
 - Started initial tests with Mahati
- Dominique
 - Brainstormed design idea for syringe pullback mechanism based on client meeting
 - Research on negative pressure mechanisms in fluidic systems
- Steph
 - Updated IRE design
 - Researched briefly about resin printing
 - 3D printed in anticipation of testing
- Sophie
 - Met with Client
 - Met with Advisor
- Mahathi
 - Met with client
 - Started testing the button element with circuit

Activities

| Name | Date | Activity | Time (h) | Week Total (h) | Sem. Total (h) |
|---------|----------------|------------------------------------------------------------------------------------|----------|----------------|----------------|
| Mahathi | 03/22 3/24 | Testing Met with Dr.Dean | 2 1 | 3 | 22 |
| Steph | 03/22 03/23 | Research on resin printing & redesign IRE Print KSMs in anticipation of testing | 1 0.5 | 2 | 23.5 |

| | | | | | |
|-----------|--------------------------------------------------------------------------------------------|--------------------------------------------------------|------------|---|-------|
| | 03/25 | Re-print KSMs after printing had failed | 0.5 | | |
| Dominique | 3/25 3/26 | Team meeting with Dr. Dean Brainstormed Design idea | 1 | 1 | >10hr |
| Sophie | 03/24 03/24 | Met with client Met with advisor | 0.5 0.5 | 1 | 22 |
| Ana | Filled form for purchase Started initial tests with Mahati Integration tests | 0.5 1 1.5 | 3 | 3 | |