

**BME 400 Weekly Progress Report**  
Team #31: Microscope Cell Culture Incubator

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Progress Report Period: Wednesday, March 29th- Wednesday, April 5th

**Project Overview**

Live cell imaging systems provide a controlled environment for cells to continue to live in while imaging is performed. Current live cell imaging chambers that are compatible with a standard inverting microscope are expensive do not perform well with small culture vessels such as microfluidic devices. The team’s goal is to design a low-cost incubator for use on a microscope that can sustain cell life while imaging is performed on a variety of cell-culture platforms.

**Restatement of Second Semester Team Goals**

- Further develop the prototype so that it is user friendly and readily available for extensive testing
- Conduct further testing and systems validation of the model
- Produce comprehensive written report

**Summary of Team Accomplishments**

- Trevor (BPAG): Full system testing with immersion heater
- Steve (Communicator): Worked on Outreach deliverables.
- Jenny (BWIG): LCD display integration finalized, imaging tests and startup time testing with new water heater
- Jack (Leader): Ordered the PCB as well as all components needed to fabricate it
- Peter (BSAC): Completed outreach, continued water heater testing/design.

**Summary of Design Accomplishments:**

**Activities**

Person	Date	Activity	Time (hr)	Weekly Total (hrs)	Semester Total
Team	3/30/17	Team Meeting, preparation for outreach	2.5	4.5	19.5
	3/31/17	SOHE Outreach	1.0		
	3/31/17	Team Meeting	1.0		
Trevor	4/3/17	Full system testing	2.0	2.5	29.75
	3/29 - 4/4	Communications about supplies/parts	0.5		

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	3/29 - 4/4	Communications about supplies/parts	0.5		
Steve	3/31/17	Outreach Deliverables	1.0	2.0	17.5
	4/2/17	Outreach Deliverables	1.0		
Jenny	3/31/17	LCD troubleshooting and integration	2.5	4.5	20.25
	4/4/17	Start up time testing and preliminary imaging with water heater in system	2.0		
Jack	4/2/17	Final EAGLE design changes	3.0	7.0	35.25
	4/3/17	Ordering PCB/components, final design rules check with Sam Lines	3.0		
	4/4/17	Drafted enclosure ideas	1.0		
Peter	4/2/17	Water Heater Testing/Designing	1.5	3.5	21.25
	4/5/17	Design Testing	2.0		

### Team Goals for Next Week

- Collaborate on enclosure design
- Work on testing protocol for live cell testing
- Validate immersion heater
- Define size of the glass that we want

### Individual Goals

- Trevor: Make sure we have everything ordered that we need for this semester, develop CAD and test for final prototype
- Jenny: Identify more permanent cell source for imaging, executive summary
- Peter: Complete Outreach event, test incubation system with water heater. Make final modifications to structure.
- Jack: Draft final plan for fabrication, work on enclosure
- Steve: Complete Outreach deliverables, get set projected timeline for glass shop inquiry/order it test immersion heater.

### Difficulties

We are happy with initial tests of the immersion heater, however this will require more validation and data collection that we will have to do before live cell tests.

### Project Schedule

Tasks	Jan		February				March					April				May	
	20	27	3	10	17	24	3	10	17	24	31	7	14	21	28	5	8
Project Development																	
Research	x	x	x	x					x								
Brainstorming	x	x	x	x					x								
Design Matrix				x													
Materials			x	x		x	x	x			x						
Fabrication				x	x	x	x	x	x		x						
Testing			x	x	x	x	x	x	x		x						
Final Design								x			x						
Deliverables																	
Progress	x	x	x	x	x	x	x	x	x	x		x					

Deliverables															
Progress Reports	x	x	x	x	x	x	x	x	x		x				
PDS		x													
Mid-semester Powerpoint				x	x										
Mid-semester Report					x										
Patenting															
Final Poster															
Final Report					x										
Meetings															
Team	x	x	x	x	x		x	x	x		x				
Advisor		x		x	x			x							
Client		x			x		x								
Website															
Updates	x	x	x	x	x	x	x	x	x		x				

Colored boxes are anticipated work. X's indicate progress or completion.

**Expenses to date for second semester**

- Multi-Output AC DC Converter: \$28.48
- 15Ohm 2W Resistors (2): \$0.40
- 36Ohm 5W Resistors (2): \$1.12
- Immersion heater: \$26.00 + \$10.00 shipping = \$36.00
- CO2 Tank: \$13.94

Total: \$73.94