

Calibrated Eye Dropper

Week 12: April 10, 2009 – April 16, 2009

Team: Sarah Switalski – Co-Leader
Michelle Tutkowski – Co-Leader
Brooke Sampone – Communicator
Jim Mott – BWIG
Eamon Bernardoni – BSAC

Client: B'Ann Gabelt
UW Dept. of Ophthalmology and Visual Sciences
UW School of Medicine and Public Health
Phone: (608) 263-5125, Email: btgabelt@wisc.edu

Advisor: Pamela Kreeger
Assistant Professor, Biomedical Engineering
Phone: (608) 890-2915, Email: kreeger@wisc.edu

Problem Statement:

A lab in the Department of Ophthalmology and Visual Sciences needs a device to accurately and efficiently deliver 5 μ L drops of experimental drugs into the cornea of the eye for glaucoma therapy testing in animals. Currently, the client uses standard micropipettes which deliver exactly 5 μ L drops, but this method is time consuming, poses a danger to the safety of the animal and makes drop placement difficult. The objective is to optimize accuracy, efficiency, and animal safety in optical drug delivery.

Previous Week's Goals:

- Continue fabrication of modified MiniFIX pipette
- Obtain hygienist polish containers for Eppendorf holder
- Research potential diaphragm covers for Eppendorf holder
- Discuss testing procedure for prototype
- Work on the design and fabrication of a tip ejector modified so that it is compatible with the MiniFIX pipette

Week 12 Activities:

Individual	Activity	Time (hours)	Weekly Total (hours)	Overall Total (hours)
Michelle	Independent	0.00	6.00	48.75
	Team Meeting	6.00		
	Client Meeting	0.00		
Eamon	Independent Work	3.50	8.50	66.00
	Team Meeting	6.00		
	Client Meeting	0.00		
Sarah	Independent Work	0.50	6.50	52.75
	Team Meeting	6.00		
	Client Meeting	0.00		
Brooke	Independent Work	0.50	3.50	53.50
	Team Meeting	3.00		
	Client Meeting	0.00		
Jim	Independent Work	2.50	8.50	66.00
	Team Meeting	6.00		
	Client Meeting	0.00		

Summary of Accomplishments:

After testing the molding properties of PMMA with a MiniFIX pipette, the team decided to use a sheath of aluminum foil around the MiniFIX when molding so the pipette can be removed after the mold is set. The team continued fabrication by making a PMMA mold inside one of the ergonomic grips and modifying the tip ejector to increase its durability. The team began fabrication on the second ergonomic grip by hollowing out an area for the thumb lip of the MiniFIX pipette to rest in. The team also obtained Eppendorfs from Professor Kreeger and hygienist rings to hold the Eppendorfs.

Next Week's Goals:

Individual Goals:

- Brooke: Prototype fabrication, testing procedure, keep in contact with client
- Eamon: Prototype fabrication, testing procedure, BSAC
- Jim: Prototype fabrication, testing procedure, maintain website
- Michelle: Prototype fabrication, testing procedure, prepare progress report
- Sarah: Prototype fabrication, testing procedure

Team Goals:

- Finish PMMA molds for both ergonomic pipette grips
- Finish tip ejector modifications to be compatible with MiniFIX pipette
- Fabricate ring Eppendorf holders
- Research and implement idea of diaphragm Eppendorf caps
- Devise and write testing procedure

Difficulties:

There are no difficulties at this time.

Project Schedule:

Tasks	Jan		Feb				Mar					Apr				May		
	23	29	6	13	20	27	6	11	13	20	27	3	10	17	24	1	6	8
Research	X	X	X	X														
Brainstorming	X	X	X	X	X													
PDS			X															
Prototype Design				X	X	X	X											
Prototype Fabrication								X	X	X	X	X	X					
Testing																		
Meeting with Client		X		X							X							
Team Meeting	X	X	X	X	X	X	X		X		X	X	X					
Presentation							X											
Written Reports								X										
Peer/Self Evaluations									X									

Expenses:

Two miniFIX micropipettes from Dynalab cost \$39.60.

One packet of three Ultra Precision Compression Springs from McMasterCarr cost \$7.70.

The team received 4 oz. of PMMA from Greg Gion.

The team has ordered 3 additional MiniFIX micropipettes from Dynalab.