

Perfusion Chamber with Elastic and Porous Membrane

Client: Dr. Donna Peters, UW Medical Sciences Center Department of Pathology

Advisor: Professor William Murphy, Ph.D.

Team: Holly Liske, Leader

Laura Piechura, Communicator

Joey Labuz, BWIG

Kellen Sheedy, BSAC

Problem Statement

Dr. Peters aims to test the effects of various drugs on the movement of fluid across a layer of human eye cells. Currently, the eye cells are supported on a silicon membrane that simulates the flexibility of the tissue in vivo. The membrane is placed in an Ussing perfusion chamber that measures the effects of pressure on the cell layer. This experimental system must be redesigned to allow greater control of the experimental conditions. Specifically, the chamber must allow for control of the movement of fluid, easy replacement of cell culture plates, and measurement of fluid pressure with computer-controlled transducers. In addition, a porous elastic membrane that permits fluid flow will replace the silicon membrane of the current system. A successful design will be used to screen for potential treatments of glaucoma.

Week One

Goals:

- Form a team to begin work on the project.
- Take a group photo to be posted on the project website.
- Review group members' weekly schedules to plan future meeting times.
- Contact the client to schedule a preliminary meeting.

Activities:

- Holly: Called Dr. Peters to schedule a preliminary meeting (0 hr).
Began literature search of background information (1 hr).
- Laura: Emailed Dr. Peters to introduce our team and schedule a preliminary meeting (0.25 hr).
Began literature search of background information (1 hr).
- Joey: Began literature search of background information (1 hr).
- Kellen: Began literature search of background information (1 hr).

Accomplishments:

- Took a group photo.
- Chose Wednesday evenings as a default time for future out-of-class meetings.
- Scheduled a preliminary meeting with Dr. Peters.
- Gained background knowledge of the perfusion chamber project.

Difficulties:

- No team member is available during the scheduled BSAC meeting time. Kellen plans to maintain email contact with the BSAC Chair Mollie Lange.

Week Two

Goals:

- Meet with Dr. Peters on Friday, September 14 at 12:30 pm in 6590 Medical Sciences Center.
- Continue literature search of background information.
- Create informal list of project design specifications.
- Begin brainstorming project design ideas.

Week One Progress Report: September 7 to 13, 2007

Project Timeline

Team Goals	9/7	9/14	9/21	9/28	10/5	10/12	10/19	10/26	11/2	11/9	11/16	11/23	11/30	12/7	12/14
Propose project	—														
Conduct background research	—	—	—												
Meet with Dr. Peters		—	—												
Develop PDS			—	—											
Brainstorm design ideas	—	—	—	—	—	—	—	—							
Choose design alternatives					—	—									
Plan midsemester presentation					—	—	—								
Write midsemester paper					—	—	—	—							
Choose final design								—	—						
Order materials									—	—					
Construct prototype									—	—	—	—			
Test prototype													—	—	
Plan final poster presentation												—	—	—	
Write final paper												—	—	—	
Meet with Professor Murphy														—	—

Expenses

No expenses have been incurred.