

**Title:** Microencapsulation of tissues and cells for treatment of hormone-related diseases.  
(microencapsulation), Project #4

**Client:** Dr. Craig Atwood (GRECC 11G, VA Hospital)

**Faculty Advisor:** Professor William Murphy (2154 ECB)

**Team** Albert Kwansa, Team Leader

**Members:** John Harrison, Team Communicator

Yik Ning Wong (Jacqueline), Biomedical Student Advisory Committee (BSAC) Representative

Eric Lee, Biomedical Web Implementation Group (BWIG) Representative

**Project Webpage:** [http://homepages.cae.wisc.edu/~bme200/microencapsulation\\_f06](http://homepages.cae.wisc.edu/~bme200/microencapsulation_f06).

**Dates:** 12/4/06 – 12/10/06, Weeks 14 (Progress Report #12)

**Project Design Statement:** To design polyethylene glycol diacrylate (PEG-dA) hydrogels for the encapsulation of Murine Leydig Tumor Cells in an effort to increase cell viability and testosterone secretion. The PEGDA hydrogels must provide immunoprotection and allow for the effective diffusion of oxygen, nutrients, hormones, and metabolic wastes. The overall goal is to restore the testosterone level of castrated mice via injection or implantation of the PEG-dA encapsulated cells.

**Restatement of Previous Team Goals:**

1. Perform Cell Titer-Blue Cell Viability Assay on cells to be obtained on 12/4/06 and evaluate the effects of exposure time – 365 nm UV light.
2. Complete lyophilization of PEGdA samples and perform photopolymerization [initially to observe whether they are any further complications with gelation].
3. Continue research on experimental parameter rationalization and use this research in conjunction with UV-cell experimental results to propose an optimized design for the process of developing PEGdA 12000 gels for encapsulation.
4. Continue to develop presentation for final poster session and writing of the final report.

**Summary of Team Accomplishments:**

1. Performed Cell Titer-Blue Cell Viability experiments and PEGdA hydrogel swelling studies.
2. Presented during final poster session on Fri, 12/8/06 at 12:16pm in ECB atrium.

**Current Individual Goals:**

- Albert Kwansa [Team Leader]:  
Work on 12<sup>th</sup> progress report due Sunday, 12/10/06 by 5pm.
- John Harrison [Team Communicator]:
- Yik Ning Wong (Jacqueline) [BSAC Representative]:
- Eric Lee [BWIG Representative]:

**Summary of Current Team Goals:**

1. Complete the final report and prepare design notebooks for the 2<sup>nd</sup> evaluation due Wednesday, 12/13/06.
2. Gather lab supplies, determine a location for storage, and keep an inventory of all materials, reagents, and assay kits and their locations for next semester.

**Fall Semester Schedule:**

Week	Day	Date	Activities	Goals (From BME Schedule)
1	M	9/4	<b>Labor Day</b>	
	T	9/5		
	W	9/6		
	R	9/7		
	F	9/8		
			Take team photo. General research of project topic. Review past reports and presentations.	[Form teams. Select project. Contact client. E-mail team roles to advisor.]
2	M	9/11	<p>Team meeting-1 on Mon, 9/11 at 11 am in ECB. (Develop list of questions for first client meeting)</p> <p>Client meeting-1 on Fri, 9/15 at 12:00 pm in GRECC, VA Hospital.</p>	[Literature search. Meet w/Client.]
	T	9/12		
	W	9/13		
	R	9/14		
	F	9/15		
3	M	9/18	<p>Advisor meeting-1 on Mon, 9/18 at 4 pm near 2154 ECB.</p> <p>Team meeting-2 on Thurs, 9/21 at 7:00 pm in ECB.</p>	[Develop understanding of project. Develop PDS.]
	T	9/19		
	W	9/20		
	R	9/21		
	F	9/22		
4	M	9/25	<p>Team meeting-3 on Mon, 9/25 at 2:30 pm in ECB. Advisor meeting-2 on Mon, 9/25 at 3:30 pm near 2154 ECB. Team meeting-4 on Tues, 9/26 at 8:15 pm in ECB.</p> <p>Advisor meeting-3 on Fri, 9/29 at 1:00 pm near 2154 ECB. (Evaluate current direction)</p>	[Brainstorm]
	T	9/26		
	W	9/27		
	R	9/28		
	F	9/29		
5	M	10/2	<p>Team meeting-5 on Mon, 10/2 at 2:30 pm in ECB. Advisor meeting-4 on Mon, 10/2 at 3:30 pm near 2154 ECB.</p> <p>Team meeting-6 on Sun, 10/8 at 7:00 pm in ECB.</p>	[Design Alternatives]
	T	10/3		
	W	10/4		
	R	10/5		
	F	10/6		
6	M	10/9	<p>Advisor meeting-5 on Mon, 10/9 at 3:30 pm near 2154 ECB.</p> <p>Lecture: [Oral Presentation Guidelines, Peer Review of Report Drafts]</p>	[Work on Mid-Semester Presentation & Report]
	T	10/10		
	W	10/11		
	R	10/12		
	F	10/13		
7	M	10/16	<p>Team meeting-7 on Mon, 10/16 at 2:30 pm in ECB. Advisor meeting-6 on Mon, 10/16 at 3:30 pm near 2154 ECB.</p> <p>Team meeting-8 on Fri, 10/20 at 12:00 pm in ECB.</p>	<b>Work on Mid-Semester Presentation</b>
	T	10/17		
	W	10/18		
	R	10/19		
	F	10/20		
8	M	10/23	<p>Team meeting-9 on Mon, 10/23 at 3:20 pm in ECB. Advisor meeting-7 on Mon, 10/23 at 3:30 pm near 2154 ECB.</p> <p>Team presentation development in CAE at 5:30 pm. Team presentation development in ECB at 5:45 pm. Team presentation practice at 9:30 pm in room 1047 ECB (reserved through Student Leadership Center).</p> <p><b>[MID-SEMESTER PRESENTATIONS] *NEW (BME 400 Only)</b> <b>[Design Notebooks Due to Advisor] **NEW</b></p>	[Decide on Final Design]
	T	10/24		
	W	10/25		
	R	10/26		
	F	10/27		

9	M	10/30	Team meeting-10 on Mon, 10/30 at 2:30 pm in ECB. Advisor meeting-8 on Mon, 10/30 at 3:30 pm near 2154 ECB.	[Work on Design]
	T	10/31		
	W	11/1		
	R	11/2		
	F	11/3	Team meeting-11 on Fri, 11/3 at 12:00 pm in ECB.	
10	M	11/6	Team meeting-12 on Mon, 11/6 at 2:30 pm in ECB. Advisor meeting-9 on Mon, 11/6 at 3:30 pm near 2154 ECB.	[Work on Design]
	T	11/7		
	W	11/8		
	R	11/9		
	F	11/10	Lecture: [Machine Shop required lecture] Team meeting-13 on Sat, 11/11 at 4:30 pm in ECB.	
11	M	11/13	Meeting w/Amy on Mon, 11/13 at 12 pm at Rennebohm Hall. Advisor meeting-10 on Mon, 11/13 at 3:30 pm near 2154 ECB.	[Work on Design]
	T	11/14		
	W	11/15		
	R	11/16		
	F	11/17	Lab time: Diacrylation of PEG from 11/17 – 11/19 at Rennebohm Hall primarily carried out by Amy (Graduate Student from Dr. Kao’s Lab).	
12	M	11/20		[Work on Design]
	T	11/21		
	W	11/22		
	R	11/23		
	F	11/24	<b>THANKSGIVING</b>	
13	M	11/27	Advisor meeting-11 on Mon, 11/27 at 3:30 pm near 2154 ECB.	[Work on Design]
	T	11/28		
	W	11/29	Lab time: Attempted photopolymerization using PEGdA synthesized in Dr. Kao’s Lab.	
	R	11/30	Lab time: Diacrylation of PEGdA in Chemistry Lab.	
	F	12/1	Lab time: Diacrylation of PEGdA in Chemistry Lab.	
	S	12/2	Lab time: Drying and gelation of PEGdA, Freezing of PEGdA in Prof. Masters Lab.	
	N	12/3	Lab time: Started & finished lyophilization of PEGdA.	
14	M	12/4	Lab time: Cell Titer-Blue Cell Viability Assay on [PC3 Flask #1].	[Work on Presentation]
	T	12/5	Lab time: PEGdA hydrogel swelling experiments.	
	W	12/6	Lab time: UV Exposure experiment on PC3 cells and incubation at 37°C. [PC3 Flask #2]	
	R	12/7	Lab time: Cell Titer-Blue Assay on yesterday’s samples.	
	F	12/8	<b>[FINAL POSTER PRESENTATIONS]</b>	
15	M	12/11		[Final Meeting w/Advisor]
	T	12/12		
	W	12/13	<b>[Final Report &amp; Design Notebooks Due to Advisor]</b>	
	R	12/14		
	F	12/15		