Title: Microencapsulation of Tissues and Cells

Team Members:
Joe Zechlinski – Team Leader
Bryan Baxter – Communications
Timothy Eng – BWIG Representative
April Zehm – BSAC Representative

Client:
Craig Atwood, Ph.D.
Research Director, UW Memory Research Program
University of Wisconsin-Madison Medical School
Research Director, Wisconsin Alzheimer's Institute
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Date: 09/01/05 – 09/08/05

Problem Statement:
A method of treatment for various diseases incorporates the encapsulation of cells and tissues and the time-released delivery of chemical mediators. Presently, this method encounters a slew of problems, including a lack of biocompatibility, limited immunoprotective properties, and hypoxia. The client desires the development of microcapsules that would permit the successful release of hormones (namely, testosterone and inhibin) by encapsulated cells into animals, while avoiding the aforementioned problems.

Last Week’s Goals:
• N/A

This Week's Goals:
• Meet as team to update PDS and discuss this semester’s goals
• Meet with client to discuss future directions

Summary of Accomplishments:
• Will continue project on two fronts as discussed with client: (a) developing nozzle to eject cell/PEG suspensions; (b) begin MA-10 cell viability and possibly hormone testing on thin membrane PEG macroscaffolding

Difficulties: Must define appropriate sites and supply sources to begin research. Most likely, PEG will be diacrylated in Prof. Murphy’s lab, cell experiments with PEG conducted in Dr. Atwood’s lab, and current nozzle work done in Prof. Williams’ lab.
Activities:

Team: 2.5 hours – team meeting (1.5) and client meeting (1)
Joe Zechlinski: 0.5 hours – progress report
Bryan Baxter: 0.5 hours – solenoid nozzle investigations
Tim Eng: 0.25 hours – updating design notebook
April Zehm: 0.25 hours – updating design notebook

Total time this week: 4 hours
Cumulative Project time: 4 hours

Project Timeline:

<table>
<thead>
<tr>
<th>Week of</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
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<tr>
<td></td>
<td>2 9 16 23</td>
<td>14 21 28</td>
<td>4 11 18 25</td>
<td>2 7 9</td>
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Deliverables
- Progress Reports
- Midsemester Presentation
- Final Poster Presentation
- Design Notebooks
- Final Report

Meetings
- Client
- Final Meeting with Advisor

Research
- Materials
- Droplet Generation
- Design
- Polymer/Hybrid
- Printing Methods
- Testing
- Limitations
- Efficacy

Prototype
- Order Materials
- Printer Modifications
- Produce Capsules
- Encapsulate Cells

Website Updating

Team: Joe Zechlinski, Bryan Baxter, Tim Eng, April Zehm

Cost Analysis:

<table>
<thead>
<tr>
<th>Date</th>
<th>Item</th>
<th>Cost</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-17-05</td>
<td>Epson R200 Printer</td>
<td>$94.00</td>
<td>From UW DoIT; for droplet generation</td>
</tr>
<tr>
<td>3-17-05</td>
<td>Irgacure 2959</td>
<td>$0.00</td>
<td>Free sample from Ciba</td>
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<tr>
<td>3-17-05</td>
<td>Depression Slides (24)</td>
<td>$15.90</td>
<td>From Fisher; for use with printer</td>
</tr>
<tr>
<td>4-1-05</td>
<td>Eppendorfs, tubing, etc.</td>
<td>$0.00</td>
<td>Provided by Prof. Williams</td>
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<tr>
<td>4-1-05</td>
<td>Linux computer</td>
<td>$0.00</td>
<td>Provided by Prof. Williams</td>
</tr>
<tr>
<td>Date</td>
<td>Item Description</td>
<td>Cost</td>
<td>Provider</td>
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<tr>
<td>4-1-05</td>
<td>UV lamp</td>
<td>$0.00</td>
<td>Provided by Prof. Williams</td>
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<tr>
<td>4-15-05</td>
<td>Mineral Oil</td>
<td>$0.00</td>
<td>Provided by Prof. Murphy</td>
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<tr>
<td>4-15-05</td>
<td>PEG/PEG-DA (various MW)</td>
<td>$0.00</td>
<td>Provided by Prof. Murphy &amp; Williams</td>
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