## UNDERGRADUATE RESEARCH LONG TERM GRANT APPLICATION

### Budget Worksheet

<table>
<thead>
<tr>
<th>BUDGET ITEM</th>
<th>Department or College Funds</th>
<th>Outside Agency Funds</th>
<th>Personal Funds</th>
<th>Undergrad. Research Funds</th>
<th>GRAND TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials</td>
<td></td>
<td></td>
<td></td>
<td>$3,238.00</td>
<td>$3,238.00</td>
</tr>
<tr>
<td>Equipment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stipend:</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Hrs @ $10/hr</td>
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<tr>
<td>Benefits @ 8.5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mileage to gather Data (.36 per mile)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRAND TOTAL</td>
<td></td>
<td></td>
<td>$3,238.00</td>
<td>$3,238.00</td>
<td></td>
</tr>
</tbody>
</table>

### NOTES:

- Equipment and left-over materials purchased with this grant will remain the property of WSU.
- You may not request money for gas purchases for travel. WSU reimburses travel expenses at a set mileage rate only.
- Benefits are required to be deducted for everyone even if you are already employed by Weber State University. This is mostly workers compensation insurance which is required by law.
- Students do not receive “benefits” money but you MUST show benefits (@8.5%) calculation in the “Stipend” section (above).
Project Description

Thromboxane $A_2$ (TXA2) has been shown to be an agonist in platelet activation and aggregation, leading to blood clots in the body. Today, many doctors recommend that patients at risk for cardiovascular disease take low doses of aspirin to lower thromboxane levels (Berger). However, studies have shown that a percentage of people have resistance to the effects of aspirin. In cases such as this, it is beneficial for both doctors and patients to find other methods of decreasing TXA2 levels. Omega 3 fatty acids, commonly found in fish oil, have been proven to reduce thromboxane production in humans. Omega 3 fatty acids may be used in lieu of aspirin to lower these levels. The intent of this study is to determine the impact of varying doses of fish oil on reducing thromboxane levels in healthy individuals.

In order to determine these effects, participants will be placed into one of three groups and each group will receive a different dosage of fish oil. Over the course of this study, three finger sticks and urine samples will be collected from each participant and sent to a reference lab for analysis. These samples will then be analyzed using both a T-Test and an ANOVA, which will allow researchers to determine if there are any statistically significant differences in thromboxane levels obtained.

Thromboxane $B_2$ (TXB2) is an inactive product of TXA2 that is almost entirely excreted in the urine. Utilizing the 11-dehydrothromboxane $B_2$ test, the levels of TXB2 in the urine will be determined and will represent the amount of TXA2 in the blood. Omega 3 fatty acids consist mainly of two essential fatty acids, eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). The proper ratio of EPA to DHA is critical in the prevention of cardiovascular diseases (Rupp). Utilizing the EPA/DHA ratios from the finger sticks, the most beneficial dose of EPA and DHA will be determined.

In 1985, von Schacky et al conducted a study on six healthy males to evaluate the long term effects of dietary marine omega-3 fatty acids on platelet function. A similar study was conducted in 1993 by Mashiach et al on pregnant women to determine the effects of polyunsaturated fatty acid supplements on thromboxane levels. In both studies, it was found that thromboxane levels decreased after the fish oil supplement was taken. Other studies have been conducted evaluating the beneficial
effects of fish oil in patients with cardiovascular disease, myocardial infarct, and stroke (D Schoenfeld, et al.). Through this study, the most beneficial dosage of Omega-3 fatty acids to lower TXA2 levels will be determined.

Students will be designing this study, collecting samples, and sending them to a reference laboratory to be tested. This is an independent research project in that their faculty mentor will be involved only in the supervision and counseling of them throughout this project.

Dependent ___________________________________________ X__ Independent
(student helping faculty do research) (student doing own research)

As third year medical laboratory students at Weber State University, students have been taught numerous testing procedures in the areas of hematology, clinical chemistry, and urinalysis. This has been accomplished via the completion of the following courses: MLS 1113, MLS 1123, MLS 2212, and MLS 2214. Also, one researcher has three years of patient care experience, and has been trained as a Certified Nursing Assistant, which will allow students to be more professional in collecting samples from participants.

The findings of this research project will be submitted for possible presentation at the National Conference of Undergraduate Research (NCUR) in the spring of 2012. Research findings will also be submitted for possible publication in ERGO and other scientific journals, such as Blood.

Works Cited:


Schoenfeld D, et al. "Effects of a small quantity of omega-3 fatty acids on cardiovascular risk factors in NIDDM. A randomized, prospective, double-blind, controlled study." Diabetes Care 17.1

Project Methods & Timeline:
- Recruitment of 180 participants will take place throughout the first two weeks of January 2012. Flyers will be used to explain both the importance and benefits of the study. Participants will consist of students in various classes at Weber State University and members of the community. Subjects are to be healthy individuals, who do not have any long-term diseases (i.e. diabetes, AIDS, cancer, etc.) Any individual who has experienced an inflammatory event in the past two weeks, or has ingested alcohol, NSAIDS, or other blood thinners in the past 48 hours will be excluded from this study.

- On January 17, 2012 and January 20, 2012, the first and second samples from participants will be collected in order to establish a baseline, which will serve as a control for this cross-over study. Samples will consist of both a finger stick and a urine sample. Following the latter collection, fish pills of various doses will be given to participants. Each group will contain no more than 60 participants. One group will be given 66 pills, each containing 360 mg EPA and 240 mg DHA, with instructions to take two pills daily. Another group will be receiving 66 pills, each containing 400 mg EPA and 200 mg DHA, with instructions to take two pills daily. The final group will receive the same EPA/DHA ratios as the second group, but will be instructed to take four pills daily (double the dosage of the other two groups). Participants will be given a tracking sheet in order to monitor daily pill intake.

- It is assumed that each participant’s diet will not vary significantly throughout the course of this study. Because each participant’s baseline will be determined, it can be assumed that their diet will not greatly impact the results of this study.
• On February 21, 2012, final samples will be collected. This will consist of both a finger stick and urine sample. Upon completion of each collection, finger stick samples will be sent directly to the reference lab in Massachusetts. This reference lab has been selected because they will be performing each test at no charge. All urine samples will be frozen at less than 25 degrees Celsius, and sent overnight to the reference lab on February 21, 2012.

• From February 22, 2012 to February 24, 2012, final samples will be tested by the reference lab. Upon reception of the results, a data analysis will be then performed by researchers.

• This project is currently in the process of review by the WSU Institutional Review Board for Human Subjects.

**Budget Explanation:**

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol Wipes (For disinfection before blood collection)</td>
<td>$19.00</td>
</tr>
<tr>
<td>Urine Sample Collection Cups</td>
<td>$175.00</td>
</tr>
<tr>
<td>BD C&amp;S Vacutainers for Preservation of Urine</td>
<td>$450.00</td>
</tr>
<tr>
<td>Shipping Costs via UPS</td>
<td>$322.00</td>
</tr>
<tr>
<td>Finger Stick Kits</td>
<td>$565.00</td>
</tr>
<tr>
<td>Incentives for Completion of Study by Participants</td>
<td>$500.00</td>
</tr>
<tr>
<td>Fish Pills of Varying Dosages</td>
<td>$1,207.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$3,238.00</strong></td>
</tr>
</tbody>
</table>
Additional Questions

1. What funding have you received from OUR in the past? Where has your previous project been disseminated?
   N/A

2. Is this project part of a required course? If so, please indicate the support (monetary and in-kind) provided for this project by the academic department.
   This project is part of a required course. However, students will receive no financial support from the department.

3. What additional sources of funding have been solicited? Is your department willing/able to fund any equipment they will be retaining?
   No other sources of funding will be provided.

4. Where do you plan to disseminate the results of this project?
   The findings of this research project will be submitted for possible presentation at the National Conference of Undergraduate Research (NCUR) in the spring of 2012. Research findings will also be submitted for possible publication in ERGO and other scientific journals, such as Blood.

5. If you are requesting a stipend, please list all significant time commitments (5+ hours per week) that you expect to maintain over the duration of your project including, for example, class and work schedules.
   No stipend is being requested
UNDERGRADUATE RESEARCH LONG TERM GRANT APPLICATION

FACULTY MENTOR RECOMMENDATION FORM

Student Name (last, first): Devlin, Amanda

Project Title: Thromboxane Reduction Due to Varying Dosages of Omega-3 Fatty Acids

1. How long and in what capacity have you known this student?
   Two Semesters. She is currently serving under me as the senator for the Dumke College of Health Professions.

2. Briefly describe the proposed project. Is this part of a larger research project? Is this part of a course? If so, how is the project apart from the nature and scope of activities normally taken for the course (Please attach a copy of your course syllabus)?
   Students will be looking to see the effects of different doses of Omega 3 fatty acids on thromboxane levels. A similar project was conducted a few years ago by WSU students with different supplements. Yes, MLS 4801. Students use principles previously taught to explore the unknown. Syllabus available upon request.

3. Give an assessment of the project’s significance to the student’s discipline and of the project’s educational and/or professional benefit to the student.
   This project is significant to this discipline of the students. Outcomes of this research may benefit a larger community and may have a great effect on healthcare locally, nationally and even internationally.

4. Comment on the qualifications of the student to successfully complete this project, both in terms of the project’s scope and its time frame.
   As MLS Junior students these students are well qualified to perform, analyze, present and eventually publish their findings.

5. Comment on the justification and appropriateness of the project budget, including the necessity of a stipend (if requesting one).
   NA - stipend. Partnerships with other healthcare providers have been established with donations of testing and expertise for the research project.

6. Describe your role in the project.
   I will be a mentor to oversee the research process, outcomes, analyzes, presentation and publication.

7. Include anything else that you think will be helpful to the committee in evaluating this application.
   The outcomes of this research may have a global impact on healthcare.

This project **X DOES** DOES NOT require review by the WSU Institutional Review Board for Human Subjects or the WSU Animal Care and Use Committee.

Project Mentor Signature: __________________________________________

Date: October 28, 2011

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Campus Mail Code Phone Extension