UNDERGRADUATE RESEARCH SEMESTER/EXPLORATORY GRANT APPLICATION
Cover Sheet

Amount Requested: $3286.00

Is there more than one person involved in this grant? YES

Student Information

Weiss, Alisha_____W01002349_____
Student Name (last, first) Student ID#

__(801) 867-5849_____aweiss3@yahoo.com_____
Phone Email

_____123_____Spring 2007_____
Total Number of Credits Completed Anticipated Graduation (term/year*)
(*funds may NOT be spent after graduation)

Project Information

_____Effect of Stress on Platelet Function_____
Project Title (10 words or less)

_____Hansen-Suchy, Kara_____3905_____
Faculty Mentor Name (last, first) Mail Code

_____ Dr. Ezekiel R. Dumke College of Health Professions_____
College (Weber State is the University, NOT college) Department

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

_____ _____9/25/06_____
Student Signature Date

_____ _____10/022006
Project Mentor Signature Date

__3905_____ ____8138_____
Campus Mail Phone Ext.

_____ _____10/022006_____
Undergraduate Research Committee Representative Date

_____ _____10/02/2006_____
Faculty Mentor Department Chair Date

UNDERGRADUATE RESEARCH SEMESTER/EXPLORATORY GRANT APPLICATION
Additional Students Form

Project Title _____Effect of Stress on Platelet Function_____

Student Information

_____Fenn, Nathan_____ _W00205998_____
Student Name (last, first) Student ID#

___(801) 726-0143_____NathanFenn@comcast.net_____
Phone Email

_____133_____Spring 2007_____
Total Number of Credits Completed Anticipated Graduation (term/year*)
(*funds may NOT be spent after graduation)

Student Information

_____Jonn, Majak_____W00451813_____
Student Name (last, first) Student ID#

_____(801) 641-1233_____majak99.5@juno.com_____
Phone Email

_____131_____Spring 2007_____
Total Number of Credits Completed Anticipated Graduation (term/year*)
(*funds may NOT be spent after graduation)

Student Information

_____
Student Name (last, first) Student ID#

_____
Phone Email

_____
Total Number of Credits Completed Anticipated Graduation (term/year*)
(*funds may NOT be spent after graduation)

_____ _____9/25/06_____
Student Signature Date

_____ _____9/25/06_____
Student Signature Date

_____ _____
Student Signature Date

Please make additional copies of this form for additional students.

UNDERGRADUATE RESEARCH SEMESTER/EXPLORATORY GRANT APPLICATION
Budget Worksheet

BUDGET ITEM	Department or College Funds	Outside Agency Funds	Personal Funds	Undergrad. Research Funds	GRAND TOTAL
Materials				$836.00 21 gauge collection needles, alcohol preps, gauze, bandages, sodium citrate tubes, EDTA tubes, needle gaurds, incentives, poster office supplies	$836.00
Equipment	Analyzers provided: Beckmann Coulter Max-M ™ PFA-100™ analyzer			$2450.00 Controls and Cartridges @ $15.00/assay	$2450.00
Mileage to gather Data (.32 per mile)					
GRAND TOTAL				$3286.00	$3286.00

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.

UNDERGRADUATE RESEARCH SEMESTER/EXPLORATORY GRANT APPLICATION
Body of Proposal

Project Description

Describe your role and that of the faculty mentor in the project; describe where this project falls along this research continuum:
Dependent _____ X_____ Independent
(student helping faculty do research) (student doing own research)

Heart disease remains one of the leading causes of death in men and women throughout the United States[1]. Diet, lack of exercise and genetics has all been proven factors in its cause; however, in the past few years, evidence shows that stress may be a fourth factor in increasing the risk [1-6]. Recent studies have shown that stress may increase platelet activity and platelet-leukocyte interaction through changes via the sympathetic nervous system[1-6]. The objective of this research project will be to evaluate both baseline (pre-stress) and post stress levels of platelet levels and function using laboratory instrumentation to determine if there are measurable differences.

The full contribution of stress on clot formation is still unknown, but it is thought to increase platelet activity through chemical involvement via the sympathetic nervous system. The active platelets then bind to white blood cells, causing them to release a variety of chemicals that cause complex changes that can lead to damage of the vessel lining, which in turn attracts migration of more platelets and white blood cells that lead to a formation of a clot[1]. If an increase platelet activity results in a subsequent increase risk of clot formation then reducing even temporary stress in our lives could perhaps lower the risk of developing heart attacks or strokes later in life.

In this study we will compare the effect of temporary stress stimulation on the effect of platelet function. Our hypothesis is that there will be an increase in platelet activity after a stress stimulation session as compared to baseline levels. Previous research has been inconclusive, in part due to test methodology being dependent on operator skill and other variables related to individual test subjects[1].

With the advent of new methodology, we will try to eliminate some of the previous researchers' variables by using a more reliable and reproducible platelet analyzer, the PFA-100™ [7].

The researchers plan to test over the course of several days at least a total of 50 participants composed of college aged students (18-30 years), presumably less affected by atherosclerosis, high blood pressure, heart disease, and other disorders that may predispose platelets interaction.. To establish a baseline, blood samples and vital signs will be taken prior to auditory and visual stress tests. It has been determined by a prior study that maximum platelet changes will occur approximately thirty minutes after a stressful episode[3]. Therefore we will again take all participants' vital signs immediately after the stress session and question the perceived level of stress while blood will be drawn at 30 minutes post session. Data will be collated and analyzed using Statistical Package for Social Science (SPSS) software provided by Weber State University. All participants will be provided with questionnaires regarding prior medical history of self and family, use of aspirin or other medications known to effect platelet function, and their personal perception of stress. Since certain drugs such as aspirin effect platelet function our volunteers must be pre-screened for use and removed from study if those medications.

Student participants will be recruited on campus as volunteers from the Dr. Ezekiel R. Dumke College of Health Professions. Additional incentives may be sought, such as asking the Ogden School of Massage Therapy for reduced pricing on gift certificates and/or snack food. Participants will be explained in detail both in word and writing all procedures, including the drawing of blood and potential harm from the blood collection, their personal information will be confidential, and that the research is voluntary and they can leave at any time. An informed consent form will be signed and collected from all participants. At no time will student identity be associated reported finding. The study will be conducted as a blind study for those researchers performing the laboratory analysis. This study has submitted for IRB approval on September 28, 2006.

Upon completion of this research, the students will present their results at the annual WSU Undergraduate Research Symposium in March 2007 and the ASCLS Utah Spring Seminar, and possible national presentation and publication.

Project Methods

White blood cell and platelet counts will be performed on all draws on a Coulter Max-M™ on campus within four hours of collection. Platelet studies will be performed on all draws on a PFA-100™ at Ogden Regional Medical Center or McKay-Dee Hospital within four hours of collection. Time on both assays is critical to obtaining accurate results. The entire research project will be performed by three undergraduate students, who each hold a certification as a medical lab technician and are trained in taking vital signs and performing blood draws as well as laboratory analysis. The project will be mentored and supervised by Kara Hansen-Suchy, M.Ed., MT (ASCP) from the Clinical Lab Sciences department. This research project is being performed do to the lack of conclusive research regarding the effects of mental stress on platelet function and clotting mechanisms.

The research will involve the use of a series of tests designed with no possible solution in order to effectively induce stress upon participants. Immediately afterwards a questionnaire with a self rating system will be used to assess participant stress level. The blood tests will be performed on two clinical instruments (Coulter Max-M™ and PFA-100™). The data collected will be used by SPSS software to assess baselines (initial or non-stressed) to post-stress samples.

Project Timeline

Step #	Description of Steps to be Completed	Deadline
1	Submission of IRB Application Form	09-28-2006
2	Order supplies and materials for research	10-13-2006
3	Creation of psychological tests and surveys	10-20-2006
4	Completion of PFA-100 training	10-27-2006
5	Establish research time commitment with IHC or Ogden Regional Hospital.	11-3-2006
6	Finish Participant Recruitment	1-12-2006
7	Begin Research Project	1-15-2007
8	Completion of Research Project	2-1-2007
9	Data Analysis	2-16-2007
10	Article completed and presentation for WSU Undergraduate Research Symposium and ACLS Utah Spring Seminar	3-1-2007

Budget Explanation

The following items will be provided by WSU Clinical Laboratory Sciences Department: Beckmann Coulter Max-M™ and reagents. The following item will be provided by McKay Dee Hospital or Ogden Regional Medical Center Laboratory: PFA-100™ Platelet Function Analyzer. For items bought with undergraduate funds, please refer to the grant proposal's budget form.

References

1. Brydon L, Magid K, Steptoe A. Platelets, coronary heart disease, and stress. Brain behavior, and immunity. 2006;20(20):1 13-119.

2. Aurigemma C, Crea F, Infusino F, and others. Platelet reactivity in response to mental stress in syndrome X and in stable or unstable coronary artery disease. Thrombosis research. 2005; 116(1):25-31.

3. Brydon L, Edwards 5, Erusalimsky J, and others. The influences of psychological stress and socioeconomic status on platelet activation in men. Atherosclerosis 2003; 168(1):57-64.

4. Florian L, Reka B, Maria G, and others. Effect of mental and physical stress on platelet activation markers in depressed patients and healthy subjects: a pilot study. Psychiatry research. 2004: 127(1/2):55-64.

5. Gibson L, Hamer M, Steptoe A, and others. Inflammatory and hemostatic responses to repeated mental stress; Individual stability and habituation over time. Brain, behavior, and immunity. 2006;20(5) :456-459.

6. Philip S, Kesson M, Daisy W, and others. Pathophysiological processes underlying emotional triggering of acute cardiac events. Proceedings of the National Academy of Sciences of the United States of America. 2006;103(11):4322-4327.

7. Comp C.P, Gosselin R, Mammen E, and others. PFA-100 System: A new method for assessment of platelet dysfunction. Seminars in Thrombosis and Hemostasis 1998;24: 17-24.