Proposal to
College of Agriculture
Student Computer Fees
(Spring 2003)

TITLE: Upgrading the Intermediate Human Anatomy & Physiology Teaching Lab in the Department of Zoology & Genetics

PROPOSED BY: Debora E. Christensen
Dept. of Zoology & Genetics

SIGNATURES:

Debora E. Christensen _____________________________
Dept. of Zoo/Gen

M. Duane Enger _________________________________
DEO, Zoo/Gen

PROJECT LEADER: Debora Christensen
Phone: 294.9665
Email: rocky@iastate.edu
II. PROJECT OVERVIEW AND EXPECTED BENEFIT

In the fall of 2002, the Department of Zoology and Genetics began offering an intermediate human anatomy & physiology course to meet the needs of undergraduate majors in health and human performance, exercise science, athletic training, dietetics, psychology and pre-health professions. As part of this service course, a new lab was created and new computers purchased last year to aid educational opportunities. The laboratory component alone enrolled approximately 250 students during the 2002-2003 year and with the change in catalogue requirements, lab enrollment is anticipated to increase to over 300 for the coming year.

While the course has been successful, the emphasis in lab remains restricted to anatomy with some limited physiology experimentation using selected computer simulations. The primary reason for this is due to a lack of data acquisition hardware and software that will collect the necessary measurements on a human (or animal) population and interface with our computers. The equipment that was available to the lab was borrowed from a lower-level course and is not capable of interfacing with the newer computers. In addition, competing interests means this equipment is not consistently available as needed. It is restricted in its usage to measurement of only one parameter at a time and frequently provides unreliable data. Because we only have one set up that works properly, students must often stand in line to collect data, creating a frustrating student experience that impedes creative and spontaneous self-experimentation. To provide the students with a quality learning experience that is truly hands-on, additional equipment is needed.

Specific Request
The Department of Zoology & Genetics is requesting College of Agriculture student computer fee funds to purchase hardware and software to measure EKGs, EMGs, lung volumes, O2 consumption, end-tidal CO2, skeletal muscle contraction, and nervous system conduction during reflexive pathways for a total of $29,570. This equipment and software will allow the course to expand beyond its current limitations and illustrate physiology with relevant human-centered laboratory experiments to our student population. In addition, this equipment and software is easily used and can be adapted to measure a variety of physiological parameters. Although a number of preprogrammed experiments are provided, the software has the potential to be easily modified by the course instructors so that we will be capable of designing our own experiments and changing those that exist with minimal additional expenditure. In addition, the data itself can be acquired by students and analyzed outside of class, something that has not been possible in the past.
**Items requested in this proposal:**
The Biopac Student Lab Ultimate System is a data acquisition system that will allow the measurement of a variety of physiological parameters including EMGs, EOGs, EKGs, galvanic skin response, temperature, spirometry air flow and lung volumes, skeletal muscle twitch kinetics, reflex physiology and conduction velocity, and blood pressure. The Biopac Gas-System 2 will allow O2 and CO2 gas analysis so oxygen consumption rates and changes in respiratory sensitivities can be measured under a variety of experimental conditions.

**A. Availability to Students**

**Location**
The intermediate human anatomy and physiology teaching lab is located in room 208 Science II. Ten sections will likely be offered each semester for the 2003-2004 academic year. Classes will be held Monday through Thursday in three-hour sections from 9:00 AM until 6:00 PM with 16 students per section with a group of four per lab bench. There is one MacIntosh desktop per lab bench. The labs are kept locked when class is not in session. However, the new software will allow students computer access to individual and class data even when the laboratory itself is locked.

**Student Usage**
The equipment we are requesting will be used initially by a total of approximately 300 students in 2003-2004, and this number is expected to increase in subsequent years, although no precedence currently exists from which to accurately project numbers. Approximately 68% of the students come from the College of Education and 22% from the College of Liberal Arts and Sciences with the remaining students coming from the other colleges in smaller numbers.

**B. Special Technologies**
No special technologies are needed.

**C. Facilities Needed**
No special facilities will be required.

**D. Support and Maintenance**
All support and maintenance is covered by student lab fees.
### Table 1. Full Itemized Budget (Costs for the Entire Project)

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<tr>
<th>ITEM DESCRIPTION</th>
<th>NUMBER</th>
<th>UNIT COST</th>
<th>TOTAL COST</th>
<th>FUNDING SOURCE</th>
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<td>TOTAL REQUEST</td>
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<td></td>
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### Table 2. Minimum Feasible Itemized Budget

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