

# PROPOSAL TO ESTABLISH A MAJOR IN EXERCISE SCIENCES

May 10, 2013

## I. INTRODUCTION

### 1. Name of major and degree title

BS in Exercise Sciences

### 2. School/Department Program that will administer the major

School of Biological Sciences

### 3. Faculty vote

The Department of Ecology and Evolutionary Biology met to discuss and vote on this issue on Wednesday, May 8, 2013. We are pleased to report that the department voted unanimously to support this new undergraduate major. The departmental vote was as follows:

Rank	Yes	No	Abstain	Absent	Eligible to Vote
Assist Prof	5	0	0	1	6
Assoc Prof/LSOE	3	0	0	3	6
Prof/Sr. Lect SOE	9	0	0	13	22
<b>Total</b>	<b>17</b>	<b>0</b>	<b>0</b>	<b>17</b>	<b>34</b>

Please note that we have included an e-mail (see Appendix entitled “Department of Ecology and Evolutionary Biology Vote for New Undergraduate Exercise Science Major) from Ms. Marissa Reyes who reported the results of the vote. Ms. Reyes is the Department Administrator of Ecology and Evolutionary Biology.

### 4. Is the major included in the most recent five-year plan?

No

### 5. Description & Importance

Virtually every organism is dependent on movement in one form or another. With respect to humans, physical activity imposes unique stresses on a broad spectrum of cell types, tissues, and organ systems. In so doing, physical activity plays a key role in shaping fundamental biological processes necessary for maintaining health and preventing disease. The goal of this unique program is to develop a small, highly talented pool of students who will become the future leaders that better explore the connection between physical activity and organismal health, in both human and nonhuman species. Based on their participation in this major, these students will be well

positioned to continue their postgraduate education in medicine, nursing, physical therapy, science education, biomedical engineering, and the biological sciences.

### **The Discipline as Offered at Other UC Campuses**

UC Davis offers a BS in Exercise Biology. The Exercise Biology program at UC Davis has approximately 700 majors. To our knowledge, there are no other UC campuses that offer such programs. It should be noted that the UC Davis program has a long tradition of being a robust department dating back to the 1970s. Additionally, we have included an appendix that includes a description of various universities/colleges that offer graduate programs in exercise sciences. We expect that the new proposed program will also be popular amongst our biological sciences major. Importantly, our program will be a so-called “boutique” program that will only accept 24 students per year. To some extent, we model this new proposed program after the very successful undergraduate neurobiology major at UC Irvine. The primary emphasis of this new proposed major will focus on the biological effects of physical activity/inactivity across a broad spectrum of species, but with a primary focus on humans.

### **Campus Academic Plan**

We have not indicated our interest in developing such a major in the most recent plan.

#### **(a) Timeliness**

In the past year, there has been an accelerating realization that greater emphasis needs to be placed on physical activity, especially as it relates to the heavy burden of medical costs. This is perhaps best illustrated by a significant American Heart Association Policy Statement entitled “The Importance of Cardiorespiratory Fitness in the United States: The Need for a National Registry.” In this policy statement, it is noted that “Besides being perhaps the strongest predictor of CVD (cardiovascular disease) and total mortality, CRF (cardiorespiratory fitness) is also strongly associated with other important health and functional outcomes...” The field of exercise science extends well beyond these connections, however. In humans, physical activity has broad implications with respect to diabetes and obesity. Physical activity is now known to be important for brain aging. While in most instances physical activity is beneficial, there are instances where too much physical activity may be harmful as seen in children with cystic fibrosis. The fundamental goal of Exercise Sciences is to better understand how physical activity/inactivity has shaped biological systems and more importantly, how physical activity/inactivity impact organismal health, in both human and nonhuman species. Our program will also stress that, within the animal kingdom, the capacity for physical activity is influenced by natural selection and has played a role in organismal fitness. Students will be introduced to model species that exhibit physiological responses quite different than that seen in humans. For instance, some small mammals do not exhibit significant loss of muscle mass during hibernation (an extreme model of muscle inactivity), yet such conditions are known to produce robust forms of muscle atrophy in humans. Such observations will be used to stimulate student interest in both human and nonhuman species and to introduce the concept that important insights about fundamental human biology might be discovered by employing a comparative physiology approach.

## **Needs of Society**

Inactivity and disuse are widely recognized as a significant factor in the development of a wide array of diseases some of which include heart disease, obesity, and diabetes. There is a clear need to train a new and highly specialized pool of professionals who become the leaders of tomorrow in important fields like physiology, physical therapy, medicine, and epidemiology.

## **Standard at Other Major Research Universities?**

UC Davis offers an undergraduate major in Exercise Biology. To our knowledge, there are no other undergraduate majors offered within the UC system that are comparable to the proposed new major. Given this background, however, it should be noted that there are undergraduate programs in exercise science throughout the country. Most notably these include Pennsylvania State University, Florida State University, Arizona State University, University of Maryland, Colorado State University, Rutgers, University of Utah, University of Michigan, University of Iowa, United States Military Academy at West Point and the University of Southern California

## **Aims, Objectives & Features**

### **(a) Educational importance, aims, and objectives**

Using the first two years of the biological science major as a foundation for this new proposed program, students will be admitted to the Exercise Sciences major in years three and undergo a rigorous set of courses that will blend principles of molecular biology, cell biology, biochemistry, physiology, and engineering into an educational program whereby students are introduced to the impact that physical activity/inactivity on human and nonhuman biology and under conditions of health and disease.

### **(b) Curricular Structure and Learning Goals and Objectives**

#### **Learning goals and objectives:**

As noted above, Exercise Sciences majors will develop a unique blend of knowledge in key scientific fields essential for understanding the impact of physical activity/inactivity under conditions of health and disease and in both human and nonhuman species.

Students will develop skills problem solving skills essential for understanding the impact of physical activity/inactivity in shaping human health.

Students will develop innovative approaches for studying the impact of physical activity/inactivity on human health.

### (c) Distinctive features

This will be a highly integrative program that will provide students with the opportunity to work with physiologists, biologists, physicians, and engineers interested in better understanding the role of physical activity in shaping human health. A premium will be placed on identifying students who exhibit academic excellence as not only defined by classroom performance, but also through evidence of: 1) problem solving; and 2) innovation. Students will be eligible to enter the program following completion of the sophomore year.

### 5. Timetable

We would like to initiate the major in fall, 2013.

### 6. Relationship to Existing Programs & Effects on Existing Programs

There will be no overlap with preexisting programs. Students applying to the new major will be required to take all of the coursework of biology majors during their first two years. Students applying to the Exercise Sciences major will enter the program during their third year. During years 3-4, students in the major will take coursework as defined below.

## II. PROJECTED DEMAND

### 1. Projected Student Demand

#### Projected Degrees in First Five Years

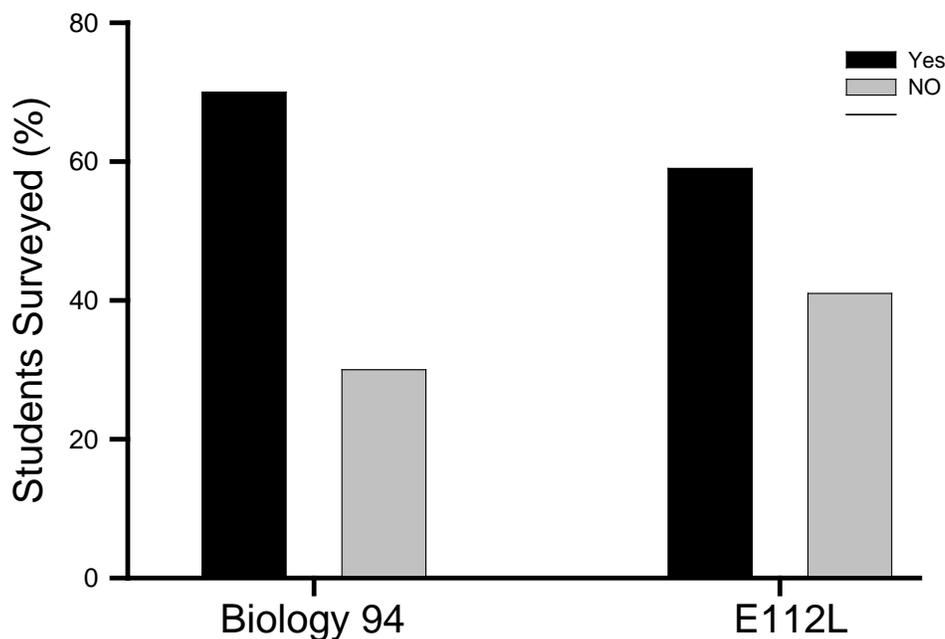
Table 1. Proposed enrollment schedule.

Year	Projected degrees
1	0
2	24
3	24
4	24
5	24

### 2. Student Input to Development of the Major

First, we would like to note that during the past five years our undergraduate Comparative Physiology of Exercise course (Biology 183) has typically had ~140 requests for enrollment. This seems like a significant level of interest, especially when the course has never been advertised to any extent. Second and more

importantly, Dr. Nancy Aguilar (Lecturer PSOE in Ecology and Evolutionary Biology) conducted two surveys during the winter 2013 quarter that provide convincing evidence that such an undergraduate major would be enthusiastically embraced at UC Irvine. Dr. Aguilar conducted two surveys: 1) students enrolled in Biology 94; and 2) students enrolled in Biology E112L, Physiology Laboratory. As summarized below, Dr. Aguilar surveyed 849 students in Biology 94 and 70% indicated that they would be interested in an Exercise Science major. With respect to those enrolled in E112L, 60% indicated that they would apply for such a major. These numbers strongly suggest that an Exercise Science major at UC Irvine will not only appeal to a large number of students but also that it will be very competitive from an academic perspective.



### III. STUDENT/FACULTY OPPORTUNITIES

#### 1. Opportunities for Graduates

This major will provide a strong foundation for students interested in pursuing graduate programs in biological sciences, biomedical engineering, and a spectrum of health science professions (e.g., physical therapists, occupational therapists, and physicians). Overall, the major will provide ideal preparation for medicine and other health professions, as well as graduate programs in biomedical engineering and a broad array of biological sciences.

## 2. Relationship to Research and Professional Interests of the Faculty

Our NIH funded T32 postdoctoral training program has acted as a catalyst to bring together key faculty on campus who are interested in the field of Exercise Science. The faculty and their area of expertise are listed in the following table:

**Table 2. Faculty, their home departments, and programmatic expertise.**

Proposed Faculty Member	Department	Programmatic Area of Expertise
Gregory Adams, Ph.D.	Physiology & Biophysics	Endocrine; myocrine factors
Manny Azizi, Ph.D.	Ecology and Evolutionary Biology	Muscle Mechanics; Neurocontrol
Ken Baldwin, Ph.D.	Physiology & Biophysics	Muscle plasticity
Tim Bradley, Ph.D.	Ecology and Evolutionary Biology	Nutrition
Vince Caiozzo, Ph.D.	Orthopedics	Muscle mechanics; myogenesis
Dan Cooper, M.D.	Pediatrics	Exercise in special populations
Steve Cramer, M.D.	Neurology	Brain injury; robotic rehab
Pietro Galassetti, M.D., Ph.D.	Pediatrics	Metabolic disorders, endocrine
Donovan German, Ph.D.	Ecology and Evolutionary Biology	Nutrition
Fadia Haddad, Ph.D.	Physiology & Biophysics	Transcriptional regulation
Jim Hicks, Ph.D.	Ecology and Evolutionary Biology	Cardiorespiratory physiology
Matt McHenry, Ph.D.	Ecology and Evolutionary Biology	Comparative biomechanics
Shlomit Radom-Aizik, Ph.D.	Pediatrics	Child health; funct. genomics
David Reinkensmeyer, Ph.D.	Mechanical and Aerospace Eng.	Robots and rehabilitation

As noted elsewhere, the primary faculty responsible for teaching the initial set of courses (i.e., those identified in Tables 3 and 4) include: 1) Drs. Bradley and German – E136 Nutrition; 2) Drs. Hicks and Caiozzo – E155 The Physiology of Extreme Environments and E183 Comparative Physiology of Exercise; and 3) Dr. McHenry – E170 Mechanical Physiology. Each faculty member has provided a letter of support, which can be found in “Primary Letters of Support.” The instruction of these core faculty will be augmented by the participation of faculty from the SOM who will participate in the seminar course, E117. As noted in the table above, this is a rich contingent of faculty in the SOM who are recognized national/international authorities in the discipline of exercise science. Therefore, it is only reasonable to try and incorporate them as best as possible. In this context, we propose to integrate the School of Medicine faculty into the seminar course

(E117). As a first approximation, we envision that SOM faculty will give 2-3 lectures per year.

#### IV. PROGRAM AND COURSES

##### 1. Curriculum

##### (a) Required and elective courses

**Table 3. Sample schedule of required and elective courses.**

FALL	WINTER	SPRING
<b>Freshman</b>		
Bio. Sci. 93, From DNA to Organism	Bio. Sci. 94, From Organisms to Ecosystems	Math 2A, Single-Variable Calculus
Chemistry 1A, General Chemistry	Chemistry 1B, General Chemistry	Chemistry 1C, 1LC, General Chemistry and lab
Humanities Core 1A	Humanities Core 1B	Humanities Core 1C
Bio. Sci. 2A, Freshman Seminars		
<b>Sophomore</b>		
Bio. Sci. 97, Genetics	Bio. Sci. 98, Biochemistry	Bio. Sci. 99, Molecular Biology
Chemistry 51A, Organic Chemistry	Chemistry 51B, 51LB, Organic Chemistry and lab	Chemistry 51C, 51LC, Organic Chemistry and lab
Chemistry 1LD, General chemistry lab	General Education	Statistics 7, Basic Statistics, or Statistics 8, Introduction to Biological Statistics
Math 2B, Single-Variable Calculus		General Education
Bio. Sci. 194S, Safety and Ethics for Research		
<b>Junior</b>		
D103 Cell Biology	Bio E183: Comparative Physiology of Exercise	
Physics 3A, Basic Physics	Physics 3B, 3LB Basic Physics and lab	Physics 3C, 3LC Basic Physics and lab
Bio E109, Human Physiology	E112L: Physiology Lab	Bio E170: Mechanical Physiology
Bio. Sci. 100, Scientific Writing		Bio. Sci. 199, Research
<b>Senior</b>		
Bio E155: The Physiology of Extreme Environments	Bio E136: The Physiology of Human Nutrition	Bio M114L: Biochemistry Lab
Bio M116L: Molecular Biology Lab	General Education	General Education
Bio. Sci. 199, Research	Bio. Sci. 199, Research	Bio. Sci. 199, Research
Bio E117A Exercise	Bio E117B Exercise	Bio E117C Exercise Sciences

Sciences Seminar Series	Sciences Seminar Series	Seminar Series
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## 2. Academic preparation for the Major

### (a) Recommended Preparation at freshman level

The core courses for biology majors.

### (b) Recommended preparation for junior-level standing

None

### (c) Change of Major Criteria

Change of major criteria:

- UC GPA of 3.0 or higher in prerequisite science classes listed below.
- Completion of Bio 93, 94, 97-99
- Completion of General Chemistry (Chem 1A, 1B, 1C, 1LC, 1LD)
- Completion of Organic Chemistry (Chem 51A, 51B, 51LB, 51C, 51LC)
- Twenty four (24) students will be admitted per year to the Exercise Sciences major. This limit is due to the space available in the major sequence of required courses (Biosci E117A-C). Students admitted to the program must have an overall 3.0 gpa in the prerequisite biology and chemistry courses.

## 3. List of Present and Proposed Courses and Impact on Existing Course Loads

Present Courses: D103, E109, N110, E112L, M116L, N113L, M114L, E136, E155, E170, E183, Stats 7, Stats 8

Proposed Courses: Biosci E117A-C – Exercise Sciences Seminar

### Impact on other undergraduate and graduate programs

These courses are unique to UC Irvine's catalog of courses and will not negatively impact any courses currently offered.

#### (a) Letter of agreement from Chairs

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#### (b) Comment letters from Chairs

- Letter from Chair Mueller (see section entitled "Primary Letters of Support")

#### (c) Letter from Deans

- Letter from Dean Bennett (see section entitled "Primary Letters of Support")

#### (d) Letter from University Librarian

NA

## 5. Proposed Catalog Copy

Virtually every organism is dependent on movement (both intracellular and extracellular) in one form or another. With respect to humans, physical activity imposes unique stresses on a broad spectrum of cell types, tissues, and organ systems. In so doing, physical activity plays a key role in shaping fundamental biological processes necessary for maintaining health and preventing disease. While both human and nonhuman species exhibit many common biological phenomenon, there are also many unique aspects of their physiology. This major will also highlight some of the unique physiological traits of nonhuman species and how such unique phenomenon may provide important insights into human health. Upper division courses in this major are designed to integrate fundamental principles of biology, chemistry, and physics into a coherent understanding of how physical activity/inactivity impacts human health under healthy and diseased states.

### UNDERGRADUATE MAJOR IN EXERCISE SCIENCES

**University Requirements:** See pages xx

#### School Requirements:

Biological Sciences 2A, 194S; Biological Sciences Core 93, 94, 97, 98, 99, 100; Chemistry 1A-B-C, 1LC-LD or H2A-B-C, H2LA-LB-LC; Chemistry 51A-B-C, 51LB-LC or H52A-B-C, H52LA-LB; Mathematics 2A-B and either Statistics 7 or 8; Physics 3A-B-C, 3LB-LC or 7C-D-E, 7LC-LD.

### REQUIREMENTS FOR THE UNDERGRADUATE MAJOR IN EXERCISE SCIENCES

A. *Required Major Courses:* D103, E109, E117A-C, E136, E155, E170, E183, N110,

B. *Upper-Division Laboratories:* E112L, M116L, and either N113L or M114L

#### Change of Major Requirements:

**Completion of:** Biological Sciences 93, 94, 97, 98 and 99, Chemistry 1A,1B,1C, 1LC, 1LD, Chemistry 51A, 51B, 51LB, 51C, 51LC by the end of the second year at UCI.

Minimum GPA: 3.0 in prerequisite science courses and cumulative GPA of 3.0.

**Application Process to Declare the Major:** The major in Exercise Sciences is open to junior- and senior-level students only. Applications to declare the major during the spring of the sophomore year. Review of applications submitted at that time and selection to the major by the Exercise Science Faculty Board is completed at the end of the sophomore year. Information can also be found at

<http://www.changeofmajor.uci.edu>. Double majors within the School of Biological Sciences or with Public Health Sciences, Biomedical Engineering: Premedical, Nursing Science, or Pharmaceutical Sciences are not permitted.

### Sample Program – Exercise Sciences

A sample program is shown in the Table 4.

**Table 4.**

FALL	WINTER	SPRING
<b>Freshman</b>		
Bio. Sci. 93	Bio. Sci. 94	Math 2A
Chemistry 1A	Chemistry 1B	Chemistry 1C, 1LC
Humanities Core 1A	Humanities Core 1B	Humanities Core 1C
Bio. Sci. 2A		
<b>Sophomore</b>		
Bio. Sci. 97	Bio. Sci. 98	Bio. Sci. 99
Chemistry 51A	Chemistry 51B, 51LB	Chemistry 51C, 51LC
Chemistry 1LD	General Education	Statistics 7 or Statistics 8
Math 2B		General Education
Bio. Sci. 194S		
<b>Junior</b>		
D103	Bio E183:	
Physics 3A	Physics 3B, 3LB	Physics 3C, 3LC
Bio E109	E112L	Bio E170
Bio. Sci. 100		Bio. Sci. 199
<b>Senior</b>		
Bio E155	Bio E136	Bio M114L
Bio M116L	General Education	General Education
Bio. Sci. 199	Bio. Sci. 199	Bio. Sci. 199
Bio E117A	Bio E117B	Bio E117C

## V. ACADEMIC STAFF Endorsement of

### 1. Faculty and Teaching Assignments

#### (a) Faculty members expected to teach on a regular basis

All of the faculty listed in Table 2 have expressed support for this major. The primary faculty responsible for teaching the initial set of courses (i.e., those identified above in Tables 3 and 4) include: 1) Drs. Bradley and German – E136 Nutrition; 2) Drs. Hicks and Caiozzo – E155 The Physiology of Extreme Environments and E183 Comparative Physiology of Exercise; and 3) Dr. McHenry – E170 Mechanical Physiology. Each faculty member has provided a letter of support, which can be found in “Primary Letters of Support.”

**VI. RESOURCE REQUIREMENTS****1. Faculty FTE**

None

**2. Teaching Assistantships**

None

**3. New library acquisitions**

None.

**4. Instructional equipment**

None.

**5. Staff**

None.

**6. Academic Advising**

Academic advising will be handled by the School of Biological Sciences.

**7. Space**

None.

**8. Other operating costs**

None.

**VII. INTERDISCIPLINARY DEGREE PROGRAMS****1. Statement of Commitment:**

NA

**2. Recognition for Faculty**

NA

**3. Statement of Faculty Participation**

NA

**(a) Level of faculty involvement**

NA

**(b) Level of faculty interest**

NA

**(c) Number of faculty who regularly give courses**

NA

**(d) Release time needed**

NA

## Format for Descriptions of New Programs in Five-Year Perspective

- **Campus** - Identify the campus on which the anticipated action will occur. If the anticipated action involves two or more UC campuses or some other entity (e.g., a DOE lab, a CSU campus), identify all participating entities and specify which is the lead campus.
  - The new major in Exercise Sciences will reside on the UC Irvine campus.
- **Name and Anticipated Action** - Provide the name of the academic program (including specific degree title; e.g., PhD, BFA), school or college, or research unit and identify the anticipated action.
  - School of Biological Sciences is proposing to initiate a new undergraduate major to be called “Bachelor of Sciences in Exercise Sciences”.
- **Description of and Reasons for Anticipated Action - Describe** the anticipated action, why it is worthwhile, and how it relates to the campus’ mission. Provide enough information so that a previously uninformed reader would have a reasonable understanding of the academic program, academic unit, or research unit that is envisioned (for creations). Describe changes being planned to existing academic programs, academic units, or research units for transfer, consolidation, disestablishment or discontinuance [TCDD].) For a school or college, include the academic degree programs, academic units, and research units it will have or does have.
  - Virtually every organism is dependent on movement (both intracellular and extracellular) in one form or another. With respect to humans, physical activity imposes unique stresses on a broad spectrum of cell types, tissues, and organ systems. In so doing, physical activity plays a key role in shaping fundamental biological processes necessary for maintaining health and preventing disease. The goal of this novel program in Exercise Sciences is to develop a small, unique, and highly talented pool of students who, through the common theme of exercise, will be able to integrate their knowledge across various levels of biological organization; from molecules to organismal function. On this background, our students will become the future leaders in exploring the connection between physical activity and organismal (human and other target species) health.
- **Relationship to Existing Campus Programs, Units, and Mission** - Identify existing campus degree programs, academic units, and/or research units that are similar to those involved in the anticipated action (whether they will be created, changed, or ended).
  - UC Irvine has never offered a degree program in the area of exercise science. Hence, the proposed program is very unique and yet positioned to take advantage of a strong collection of faculty dedicated to better understanding the connection between physical activity and fundamental physiological processes essential for maintaining and promoting animal and human health. The faculty spans the schools of Biological Sciences, Medicine, and Engineering.
- **Resources** - For anticipated creations of new programs and units, describe the new faculty, staff, courses, and facilities (including equipment, space, library) that are needed. For anticipated TCDD actions, describe current resources of the program and unit (e.g., number of tenured faculty, number of untenured faculty, staff, space, research support, supplies and equipment) and identify those that will be freed up in the anticipated action.
  - Currently, there are a number of core classes already being taught that can be used to support the overall mission of this new major. A new course, Biosci E117A-C, will provide

students with a year-long seminar series that will address fundamental topics in exercise science in a highly interactive environment between students and faculty participating in the program. Additionally, we anticipate the creation of at least 2-3 additional courses in the near future that will provide some flexibility to the major. The following table describes courses currently being offered that would be essential in fulfilling the requirements of the Exercise Sciences major.

Course Number	Course Title	Faculty Member
Biology E117 A-C	Exercise Sciences Seminar	Participating faculty
Biology E136	The Physiology of Human Nutrition	Drs. Tim Bradley and Donovan German
Biology E155	The Physiology of Extreme Environments	Drs. Jim Hicks and Vince Caiozzo
Biology E170	Mechanical Physiology	Dr. Matt McHenry
Biology E183	The Comparative Physiology of Exercise	Drs. Jim Hicks and Vince Caiozzo

- Funding** - For anticipated creations of new programs and units describe the anticipated funding sources and strategies (including fee status for graduate degree programs). For TCDD actions, describe current funding sources for the programs or unit.
  - During the initial phases of the Exercise Sciences major (initial 2-3 year period), no new funds are required. However, as the program becomes more mature, an additional series of courses will be proposed and there may be a relatively small cost to initially support these courses.
- Students** - Provide an estimate of the numbers of undergraduate and graduate students likely to be involved as the action is being implemented and when it is at a steady state. For anticipated transfers, consolidations, and discontinuances, also describe what arrangements will be made for current students to complete their degree programs.
  - We intend to admit 24 undergraduates each year after completion of their sophomore year for a total of 48 students at steady state.
- Employment Implications** - For anticipated creations of graduate degree programs, describe likely employment opportunities after degree completion. For all other anticipated actions, if there are any implications for employment of students after graduation, describe them.
  - This major will serve as an ideal preparation for a broad spectrum of health science professions and graduate programs. We anticipate that individuals graduating from this program will choose professions in academia (biological and engineering sciences) and in the health sciences (e.g., physical therapy, occupational therapy, physicians).
- UC Campuses and Other California Institutions with Similar Offerings** - Identify other UC campuses and other California institutions with academic programs, academic units, or research units similar to those for which either a creation or a TCDD action is anticipated.

•• The only UC school to offer a major similar to that proposed is UC Davis, which offers an undergraduate degree in Exercise Biology. The UC Davis program serves ~ 600 undergraduate students. As noted above, we expect that the proposed program will be much more selective and will strive to produce a unique workforce positioned to be the future leaders in this field.

- **Anticipated Campus Review and Implementation Dates** - Provide an estimate of when the proposal will be ready to begin campus review and when proposers would like to implement what is being proposed. For academic degree programs, give the preferred date for first enrolling students in a new degree program or for last enrolling students in a degree program that will be transferred, consolidated, or discontinued. For schools and colleges, ORUs, and MRUs, give the preferred date for opening a new unit or for transferring, consolidating, or disestablishing an existing unit.
  - The proposal will be ready for review by the end of April 2013, and we would like to admit the first students to the major in fall, 2013.
- **Campus Contact Person** - Identify the person leading the development of the proposal, the person bearing major responsibility for creating the proposal. In most cases this will be a faculty member. For MRUs, it will likely be the MRU director. Provide the responsible individual's name, title, department, mailing address, email address, telephone number, and fax number.

Vincent J. Caiozzo, Ph.D.  
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and

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University of California Irvine  
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# PRIMARY LETTERS OF SUPPORT

Key Administrative Letters

**Al Bennett, Ph.D.**  
Dean and Professor  
School of Biological Sciences

**Ralph Clayman, M.D.**  
Dean and Professor  
College of Health Sciences

**Dan Cooper, M.D.**  
Chair of the Department of Pediatrics  
and  
Director, Institute for Clinical and Translational Sciences

**Laurence D. Mueller, Ph.D.**  
Professor and Chair  
Ecology & Evolutionary Biology

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Key Faculty Letters

**Tim Bradley, Ph.D.**  
Professor  
Ecology and Evolutionary Biology

**Vincent James Caiozzo, Ph.D.**  
Professor  
Departments of Orthopedics  
and Physiology and Biophysics

**Donovan German, Ph.D.**  
Assistant Professor  
Ecology and Evolutionary Biology

**James Hicks, Ph.D.**  
Professor  
Ecology and Evolutionary Biology

**Matt McHenry, Ph.D.**  
Associate Professor  
Ecology and Evolutionary Biology



Albert F. Bennett  
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6 March 2013

Council on Educational Policy  
University of California, Irvine

Proposed Major in Exercise Science

I am in full support of the proposed Bachelor of Science in Exercise Sciences degree within the School of Biological Sciences. This new, cross-disciplinary program will bring together key faculty in Biological Sciences, Engineering and Medicine to examine connections between physiology, anatomy, physical activity and health. The collective expertise at UCI will combine to provide a new, selective program as we expand our campus offerings to serve increasing numbers of students.

I look forward to seeing the inception of this new major to serve students interested in pursuing academic work as well as a variety of health sciences careers. Please keep me informed of plans as this exciting opportunity progresses.

Sincerely,

A handwritten signature in cursive script, reading "Albert F. Bennett".

Al Bennett  
Hana and Francisco J. Ayala Dean



Ralph V. Clayman, M.D.  
Dean, School of Medicine  
Professor, Dept of Urology  
University of California, Irvine

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March 8, 2013

To: Council on Educational Policy  
University of California, Irvine

Re: Proposed Undergraduate Major in Exercise Science

Dear Council on Educational Policy:

This letter represents ***my most enthusiastic support*** of the proposed undergraduate major in Exercise Sciences. From my perspective, this new major will create novel opportunities for our undergraduate students, by providing them with a unique major that integrates topics spanning molecular biology-to-organismal function. Additionally, the students will have the opportunity to work with a strong group of faculty that spans the Schools of Biological Sciences, Medicine, and Engineering. In particular, some of the faculty in the School of Medicine (e.g., Drs. Adams, Baldwin, Caiozzo, Cooper, and Galassetti) are nationally and internationally known for their work in this field and will be strong participants in the Exercise Sciences major. Importantly, the new undergraduate major will provide students with the appropriate tools for successfully entering graduate programs in a wide array of professional programs in the health sciences (e.g., medical school, physical therapy, occupational therapy, etc.). I should also note that the Institute of Clinical and Translational Sciences (ICTS), a NIH funded program, has a strong interest in understanding the impact of physical activity/inactivity on health, and the resources of the ICTS will be made available to help support the Exercise Sciences major.

I look forward to the development of this program and promoting the interests of both our undergraduate students and faculty.

Sincerely,

A handwritten signature in black ink that reads "Ralph V. Clayman".

Ralph V. Clayman, MD  
Dean, School of Medicine  
Professor, Department of Urology



To: Council on Educational Policy (CEP)

Re: Newly proposed undergraduate major in Exercise Sciences

Dear Members of CEP:

This letter represents *my most enthusiastic support* for the development of the undergraduate Exercise Sciences major. As a pediatrician and scientist, I have a deep dedication to understanding the role of physical activity/inactivity in shaping the health of our lives. My entire academic career has been devoted to this theme and the development of this new major will provide the necessary pipeline of students who will ultimately go on to become leaders in the field.

I am the Director and PI of the NIH funded Institute for Clinical and Translational Sciences (ICTS). The ICTS is a \$20 million grant and funds a number of units that may be beneficial to this newly proposed undergraduate major. In particular, the ICTS has made a significant investment in the study of physical activity and health. In this context, we have two laboratories that consist of a suite of instrumentation that can be used for a variety of research and teaching activities in this field. Additionally, I and my group have established the Pediatric Exercise Research Center (PERC) that is currently conducting a number of studies in this field. The resources of both the ICTS and PERC will be made available to support both the research and teaching missions of this new undergraduate major.

I look forward to our continued interactions and working with the faculty of the new major to create an exciting opportunity for our undergraduate students in such an important area of study.

Sincerely,

Dan M. Cooper, M.D.  
Chair, Department of Pediatrics  
Director, UCI Institute for Clinical and Translational Science  
Professor of Pediatrics and Biomedical Engineering  
Associate Dean for Translational Science  
UC Irvine School of Medicine

Cc'd: Vince Caiozzo, Ph.D.  
James Hicks, Ph.D.



LAURENCE D. MUELLER

Department of Ecology & Evolutionary Biology  
Irvine, CA. 92697-2525  
Phone: (949) 824-4744  
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<http://darwin.bio.uci.edu/~mueller>

27 February 2013

Council on Educational Policy  
University of California, Irvine

*RE: Proposed major in Exercise Science*

I am writing to give my strong support to the proposed major in Exercise Sciences. This major will utilize existing courses and faculty in the Department of Ecology & Evolutionary Biology without the need for substantial additional resources. The major should appeal to many undergraduates in Biological Sciences with interests in health related professions. Additionally, this major has the potential in the future to develop highly qualified students who may participate as graduate students in UCI's growing exercise research program.

The planned growth trajectory of this major has been purposefully kept at modest levels. This will prevent the need for a major redistribution of teaching resources. However, I have no doubt that there will be many highly qualified students willing to enter this major. I think this will be an excellent program and give it my strongest support.

Sincerely,

A handwritten signature in cursive script that reads "Laurence D. Mueller".

Laurence D. Mueller  
Professor and Chair  
Ecology & Evolutionary Biology



School of Biological Sciences  
Department of Ecology & Evolutionary Biology

321 Steinhaus Hall  
Irvine, CA 92697-2525  
(949) 824-6006  
(949) 824-2181 (fax)  
<http://ecoevo.bio.uci.edu>

To: Dr. Jim Hicks  
Dr. Vince Caiozzo

March 11, 2013

Dear Jim and Vince:

I am excited about the new proposed major in Exercise Sciences and I fully support its implementation. It is my understanding that the goal of this program is to develop a small, highly talented pool of students who will engage in a major that allows them to fully explore the connection between physical activity and organismal health, in both human and nonhuman species.

As you know, I teach a nutrition course entitled "Physiology of Human Nutrition", and I see this course as playing a fundamental role in developing undergraduate students in the field of exercise science. I am not only supportive of the major, but I look forward to participating in the program as Founding Faculty Member supporting the program via my course on human nutrition. As part of my commitment to the new major, I understand the importance of offering the course on an annual basis so that students can progress on schedule for graduation in 4 years.

Best regards,

A handwritten signature in black ink, appearing to read "Timothy Bradley", is written over a large, stylized, handwritten flourish that extends to the right.

Timothy Bradley, Professor  
Dept. of Ecology and Evolutionary Biology  
University of California, Irvine



**DEPARTMENT OF ORTHOPAEDIC SURGERY**

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*Ranjan Gupta, M.D., Professor*

*Martin C. Tynan, M.D., Clinical Professor*

**MUSCULOSKELETAL ONCOLOGY**

*Bang H. Hoang, M.D., Assist. Professor*

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*Stuart A. Green, M.D., Clinical Professor*

**UCI SPINE CENTER 714 - SPINE UC**

*Nitin N. Bhatia, M.D., Assist. Clinical Professor*

*P. Douglas Kiestler, M.D., Clinical Professor*

*Charles D. Rosen, M.D., Clinical Professor*

**TRAUMA**

*Martin C. Tynan, M.D. Clinical Professor*

*David P. Zamorano, M.D. Assist. Clinical Professor*

**Orthopaedic Research Division**

**BONE BIOMECHANICS RESEARCH LAB**

*Joyce H. Keyak, Ph.D., Chief*

*Assoc. Professor in Residence*

**JOINT BIOMECHANICS RESEARCH LAB**

*Thay Q Lee, Ph.D., Chief, Professor in*

*Residence and Vice Chairman for Research*

**MUSCULOSKELETAL ONCOLOGY  
RESEARCH LAB**

*Bang H. Hoang, M.D., Chief, Assist. Professor*

**NEUROMUSCULAR RESEARCH LAB**

*Vince J. Caiozzo, Ph.D., Chief*

*Professor in Residence*

**PERIPHERAL NERVE RESEARCH LAB**

*Ranjan Gupta, M.D., Chief, Professor & Chair*

Vincent J. Caiozzo, Ph.D.  
Medical Sciences I B-152  
Department of Orthopaedics  
College of Health Sciences  
University of California  
Irvine, CA 92697

Phone: 949-824-5571

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e-mail: [vjcaiozz@uci.edu](mailto:vjcaiozz@uci.edu)

April 4, 2013

To: Council on Educational Policy (CEP)

April 11, 2013

Re: Newly proposed undergraduate major in Exercise Sciences

Dear Members of CEP:

One of the major research interests of mine during the past 35 years has been devoted to understanding the impact of physical activity/inactivity on human health with a particular focus on skeletal muscle. My work has been funded by NIH and during the past 10 years I have had a NIH T32 postdoctoral training program dedicated to producing the next generation of exercise scientists. This training program has acted as a catalyst for bringing together a large number of faculty who also have an interest in understanding the role of physical activity/inactivity in shaping human health.

Dr. Hicks and I have taught an undergraduate course (Biology 183, The Comparative Physiology of Exercise) since approximately 1992. This class has been extremely popular and has always been filled. Based on the interests of students and faculty, Dr. Hicks and I are now proposing the establishment of a new undergraduate major in biological sciences, The Exercise Science major.

We look forward to your feedback and the creation of a new successful undergraduate major.

Sincerely,

A handwritten signature in purple ink that reads "V. J. Caiozzo".

Vincent J. Caiozzo, Ph.D.  
Professor  
Departments of Orthopedics and  
& Physiology and Biophysics



**Donovan P. German, PhD**  
Assistant Professor

Ecology & Evolutionary Biology  
5234 McGaugh Hall  
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Fax: (949) 824-2181  
dgerman@uci.edu

12 April 2013

Dr. Vincent Caiozzo and Dr. James Hicks  
University of California  
Exercise Science Major

Dear Dr. Caiozzo and Dr. Hicks:

I am excited about the new proposed major in Exercise Sciences and fully support its implementation. As you know, I study digestion and metabolism in animal models and I teach a course entitled "Human Nutrition" (Bio Sci E136). I see this course playing a fundamental role in developing undergraduate students in the field of exercise science. Hence, not only am I supportive of the major, but I look forward to participating in the program through my research endeavors and as one of the primary faculty supporting the program via my course on human nutrition.

Please contact me if you have any questions.

Thank you,

A handwritten signature in cursive script that reads "Donovan P. German".

Donovan P. German



To: Council on Educational Policy (CEP)

April 11, 2013

Re: Newly proposed undergraduate major in Exercise Sciences

Dear Members of CEP:

As one of the co-developers, I enthusiastically support the proposed undergraduate Exercise Science major. As a physiologist, my research program has focused on the vertebrate cardiopulmonary system and the response of this system to the elevated metabolic demands associated with activity. Soon after arriving on the UCI campus in 1991, I met with Dr. Caiozzo and we developed a course entitled "The Physiology of Exercise" (Bio E183). This course was developed on the premise that the ability to perform exercise is of paramount importance to most animals, and integrated elements of endocrinology, neurophysiology, respiratory and cardiovascular physiology, skeletal muscle biology and biochemistry. The course has been very successful since its development—always oversubscribed and receives excellent reviews from students. In addition, we have also taught Bio E155, entitled "Physiology in Extreme Environments". In this particular course we provide an in-depth look at the physiological mechanisms that allow animals, including humans, to be physically active and survive in extreme environments (high altitude, microgravity, deserts, etc). Like BioE183, when we have offered this course, it is over subscribed.

We believe that a small "boutique" major in Exercise Science will attract high quality undergraduates and the course of study and experiences we have outlined will prepare them for additional training in medicine, physical therapy, nursing and/or graduate school. Based on the success of the courses we have offered that focus on "exercise", I suspect that the major will also be oversubscribed.

I look forward to the approval of this major and working with the students and faculty who will be associated with our program.

Sincerely

A handwritten signature in black ink that reads "James W. Hicks".

James W. Hicks, Ph.D  
Professor  
Associate Vice Chancellor for Research  
Department of Ecology and Evolutionary Biology

Cc'd: Vince Caiozzo, Ph.D.

Matthew J. McHenry, Ph.D.  
Associate Professor  
mmchenry@uci.edu 949-302-7325

March 5, 2013

Founding Faculty Member Letter of Support

Dear Jim and Vince:

As you know, I have been teach a course entitled “Comparative Biomechanics” (E170) and the overall theme of this course would mesh nicely with your newly proposed undergraduate major in Exercise Sciences. E170 provides a broad biomechanical perspective on movement and its modulation by sensory input. These are fundamental themes that span multiple disciplines, including that of exercise science. In addition, Emanuel Azizi and I are developing a course entitled “Animal Sensing and Motion” (E139), which would also appear to fit well into your proposed curriculum. As such, I look forward to offering these courses to Exercise Science majors and serving as a Founding Member of the new major.

Sincerely

A handwritten signature in black ink, appearing to read 'Matthew McHenry', with a stylized flourish at the end.

Matthew McHenry

**ECOLOGY AND EVOLUTIONARY BIOLOGY  
DEPARTMENTAL VOTE TO SUPPORT THE  
ESTABLISHMENT OF AN UNDERGRADUATE  
EXERCISE SCIENCES MAJOR**

**From:** [James Hicks](#)  
**To:** [Vincent Caiozzo](#)  
**Subject:** Fwd: Proposed New Exercise Science Undergraduate Major - EEB Faculty Vote  
**Date:** Wednesday, May 08, 2013 1:13:17 PM

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FYI

Sent from my iPhone. Please excuse typos

Begin forwarded message:

**From:** "Marissa Reyes" <[mrreyes@uci.edu](mailto:mrreyes@uci.edu)>  
**Date:** May 8, 2013, 12:49:45 PM PDT  
**To:** <[jhicks@uci.edu](mailto:jhicks@uci.edu)>  
**Cc:** <[ldmuelle@uci.edu](mailto:ldmuelle@uci.edu)>  
**Subject:** Proposed New Exercise Science Undergraduate Major - EEB Faculty Vote

Hi Jim,

Please see below regarding the EEB departmental vote in favor of the Proposed New Exercise Science Undergraduate Major.

<b>Rank</b>	<b>Yes</b>	<b>No</b>	<b>Abstain</b>	<b>Absent</b>	<b>Eligible to</b>
<b>Vote</b>					
Assistant Professor	5	0	0	1	6
Associate	3	0	0	3	6
Professor/LSOE					
Professor/Sr. Lecturer	9	0	0	13	22*
SOE					
<b>Total</b>	<b>17</b>	<b>0</b>	<b>0</b>	<b>17</b>	<b>34</b>

\*\* Dean excluded from total.

Thanks!

Marissa

***Marissa Reyes***

Department Administrator  
Ecology and Evolutionary Biology  
School of Biological Sciences

University of California, Irvine  
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**SURVEY OF STUDENTS REGARDING THE  
DEVELOPMENT OF A NEW UNDERGRADUATE  
EXERCISE SCIENCES MAJOR**

**Responses to iClicker Survey Question  
about Proposed Exercise Science Major  
Winter 2013**

**Original Clicker Question for Bio 94 (Organisms to Ecosystems)**

We are planning a new Exercise Sciences major starting in Fall 2013. It will be an integrative program with opportunities to work with physiologists, biologists, physicians, and engineers interested in studying human and non-human organisms. Students will be able to pursue postgraduate education in medicine, nursing, physical therapy, science education, biomedical engineering, and the biological sciences.

Courses will include Human Physiology, Physiology Lab, Exercise Physiology, Biomechanics, Human Nutrition, Sensory and Motor Systems, Seminar series in Exercise Science.

70% (n=598) A) Yes  
30% (n=251) B) No

**Revised Clicker Question Bio 94 (Organisms to Ecosystems)**

There has been a lot of interest in the possibility of an Exercise Sciences major. For the Biomechanics and Sensory & Motor Systems courses, you need to be comfortable with lower division calculus and physics.

Are you still interested in the major?

22% (n=178) A) Yes, I'm ok with math and physics  
34% (n=278) B) Yes, but I'm a little nervous about math and physics.  
21% (n=175) C) No. Math and physics are deal breakers.  
23% (n=193) D) No. I wasn't interested before and I'm still not interested.

**Bio 94 Responses to revised iClicker question by level**

	<b>Freshman</b>	<b>Sophomore</b>	<b>Junior</b>
Yes, I'm ok with math and physics	22%	23%	17%
Yes, but I'm a little nervous about math and physics	35%	31%	25%
No. Math and physics are deal breakers	21%	19%	35%
No. I wasn't interested before and I'm still not interested.	22%	27%	23%
<b>Number of Students</b>	<b>493</b>	<b>247</b>	<b>48</b>

### Bio 94 Responses to revised iClicker question by major

	<b>Bio Sci</b>	<b>Pharm Sci</b>	<b>Pub. Health Science</b>	<b>Undec.</b>	<b>Psych</b>	<b>Chem</b>
Yes, I'm ok with math and physics	24.2%	17.2%	10%	22.1%	26.7%	15.4%
Yes, but I'm a little nervous about math and physics	33.2%	31.1%	33.3%	36.4%	26.7%	38.5%
No. Math and physics are deal breakers	20.1%	15.6%	33.3%	31.2%	26.7%	15.4%
No. I wasn't interested before and I'm still not interested.	22.5%	36.1%	23.3%	10.4%	20%	30.8%
<b>Number of Students</b>	<b>467</b>	<b>122</b>	<b>30</b>	<b>77</b>	<b>15</b>	<b>13</b>

### Clicker Question from Physiology Lab E112L

(Note: Physiology Lab is almost 100% Senior Bio Majors, so I didn't do any analysis by level or major.)

We are proposing a new Exercise Sciences major starting in Fall 2013. It will be an integrative program with opportunities to work with physiologists, biologists, physicians, and engineers interested in studying human and non-human organisms. Students will be able to pursue postgraduate education in medicine, nursing, physical therapy, science education, biomedical engineering, and the biological sciences.

Courses will include Human Physiology, Physiology Lab, Exercise Physiology, Biomechanics (calculus & physics may be prereqs), Human Nutrition, Sensory and Motor Systems, Seminar series in Exercise Science.

If you had known about this as a sophomore, would you have applied?

59% (n=121) A) Yes

40% (n=83) B) No

**LIST OF SCHOOLS OFFERING COURSEWORK IN THE  
EXERCISE SCIENCES**

<b>Institution, program</b>	<b>S-Rank High</b>	<b>S-Rank Low</b>	<b>Research High</b>	<b>Research Low</b>
Arizona State U. Kinesiology	8	23	12	29
Auburn U. Exercise Science	34	39	29	37
Boston U. Rehabilitation Science	25	36	15	31
Drexel U. Physical Therapy & Rehabilitation Sciences	18	32	11	31
Georgia State U. Sports Science	8	26	10	31
Indiana U. at Bloomington Human Performance	26	35	35	39
Iowa State U. Health and Human Performance	10	26	19	33
Louisiana State U. at Baton Rouge Kinesiology	29	36	31	36
Michigan State U. Kinesiology	14	25	19	30
Ohio State U. Kinesiology major	14	31	9	28
Oregon State U. Exercise and Sport Science	10	26	8	23
Pennsylvania State U. Kinesiology	1	5	3	7
Purdue U. Main Campus Health & Kinesiology	30	37	28	37

Temple U. Kinesiology	28	36	27	36
Texas A&M U. Health & Kinesiology	17	29	27	36
U. of Arkansas Main Campus Kinesiology	39	41	40	41
U. of Connecticut Kinesiology	1	8	1	3
U. of Delaware Biomechanics and Movement Science	5	17	5	18
U. of Florida Health and Human Performance	4	19	4	16
U. of Georgia Exercise Science	3	12	4	18
U. of Houston Kinesiology	17	30	16	32
U. of Illinois at Chicago Kinesiology/ Movement Sciences	1	9	2	7
U. of Illinois at Urbana- Champaign Kinesiology	11	27	8	24
U. of Kentucky Exercise Science	6	23	4	16
U. of Maryland at College Park Kinesiology	6	19	6	17
U. of Massachusetts at Amherst Kinesiology	1	6	1	3
U. of Michigan at Ann Arbor Kinesiology	11	27	11	29

U. of Minnesota-Twin Cities Kinesiology	4	13	3	8
U. of Mississippi Exercise Science	37	41	36	39
U. of New Mexico Health PE & Recreation	37	41	40	41
U. of North Carolina at Chapel Hill Human Movement Science	1	8	8	26
U. of North Carolina at Greensboro Exercise and Sport Science	24	35	16	31
U. of Southern California Biokinesiology	7	23	7	24
U. of Southern Mississippi Human Performance	29	38	33	39
U. of Tennessee Exercise Science	23	34	18	31
U. of Texas at Austin Kinesiology Ph.D.	12	28	9	27
U. of Toledo Exercise Science	26	35	24	34
U. of Utah Exercise and Sport Science	37	41	29	37
U. of Virginia Kinesiology	9	23	13	29
U. of Wisconsin at Madison Kinesiology	12	28	9	23
Washing- ton U. in St. Louis Movement Science	7	23	6	21