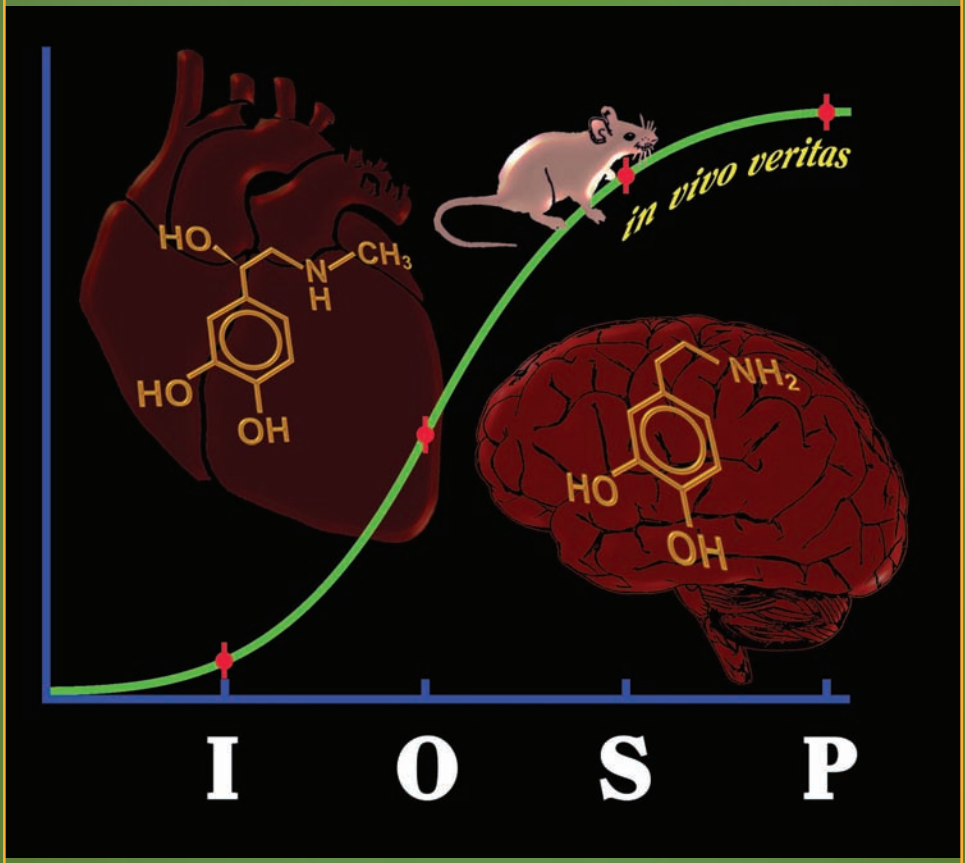
NIH-Sponsored Short Course in

Integrative and Organ Systems Pharmacology

June 1-12, 2009
Omaha, Nebraska

- A two-week intensive course with lectures, demonstrations, and hands-on experience
- Training in the use of isolated organ systems and *in vivo* animal models
- Integration of cellular and molecular pharmacology into the whole organism
- Emphasis on cardiovascular and neuropharmacology
- For graduate students, postdoctoral fellows, industry scientists, and academic faculty



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GENERAL INFORMATION

INTRODUCTION

The pharmaceutical industry and academic biomedical research institutions are increasingly realizing the essential role of intact organ systems and *in vivo* animal models in the conduct of biomedical research. There is a growing need for functional analysis of complete biological systems that include the complex genetic and environmental determinants that are only expressed in whole organisms. Examples include the dynamics of the cardiovascular system and neuronal control of complex motor behaviors.

Researchers who are skilled in taking research findings from cellular and molecular studies into integrated organ systems and whole animal studies are in great demand. To meet this need, the National Institute of General Medical Sciences (NIGMS) has provided funding for short courses to provide formal training in Integrative and Organ Systems Pharmacology (IOSP) and to enhance awareness of this rewarding career opportunity.

COURSE DESCRIPTION

This course is one of four National Institutes of Health (NIH)-sponsored courses held nationwide each year. It consists of a two-week intensive experience for 12 students followed sometime within the next year by an optional internship. The course has cardiovascular and neuropharmacology emphases, and it includes lectures, demonstrations, and an abundance of hands-on laboratory exercises. The last two days of the course feature a focused research experience in one of the Omaha faculty laboratories chosen by the student to best match their own interests. The course is now in its fifth year and has been highly successful.

Course participants are encouraged to take advantage of the opportunity for additional training following the course, through internships available in various academic and industry research laboratories. These internships provide more extensive experience with integrative pharmacology techniques and can be tailored to meet individual research and training needs. Internships can be from one week to several months in duration and can take place immediately following the course or any time in the following year. Assistance in arranging internships will be provided, and financial support will also be available for the student and/or the mentor to help cover internship expenses.

TARGET AUDIENCE

The course is designed for graduate students (PhD level) and postdoctoral fellows, but it is also appropriate for scientists in academia, industry, or government who require the skills and experience provided by the course.

COURSE GOALS AND TOPICS

GOALS

- Establish a strong connection between *in vitro* studies, organ function *in situ*, and *in vivo* results.
- Introduce students to the role of *in vivo* methods in translational research, including safety and efficacy in drug discovery and development.
- Expose students to multiple animal models and the reasons for selecting a given model for a particular purpose.
- Provide significant hands-on experience with small animal models and some exposure to larger animal models.
- Provide reinforced training in responsible conduct of research, including improved ability to articulate the need for such work in health research.
- Improve the ability of students to communicate with other scientists across a broad spectrum of research activities.

TOPICS, PROCEDURES AND TECHNIQUES (PARTIAL LIST)

Introductory and General

- Ethical aspects of care and use of animals in research
- Proper handling of animals and drug administration
- Anesthetizing and ventilating animals
- Surgical procedures on small and large animals
- Post-operative pain control
- Use of imaging techniques with experimental animals
- Primate models for biomedical research

Neuropharmacology

- Animal models in central nervous system drug development
- Behavioral studies in animal models for learning and memory, pain and motor function

Cardiovascular Pharmacology

- Effects of drugs on isolated rat blood vessels and heart preparations
- Cardiovascular instrumentation of dogs and rats
- Animal models of heart failure

ACCOMMODATIONS

HOUSING

Student housing in apartment-style dorms is available at the Clarkson College Residence Hall located within easy walking distance of the University of Nebraska Medical Center campus. These housing units consist of a common area (kitchen and living room) with three or four adjoining bedrooms and two bathrooms. Bed linens and towels are provided; however, participants need to provide their own toiletries.

For those participants who wish to stay at a local hotel, a list of recommendations with discounted room rates and within close proximity of the UNMC campus is available upon request. Participants are responsible for any expenses incurred.

MEALS

Continental breakfast will be available in the meeting room most days. Meal tickets will be provided for lunch in the UNMC campus cafeteria or lunch will be catered into the meeting room. All dinners and breakfast/lunch on Sunday, June 7, are the responsibility of each participant. Participants are welcome to utilize the UNMC campus cafeteria on the weekend or take advantage of Omaha's wide variety of outstanding restaurants and entertainment venues.

STUDENT COMMENTS FROM PREVIOUS YEARS

- *This course has been essential in my ability to collaborate on projects outside of my dissertation project. My ability to learn about other tissues and the proper way to handle and perform experiments was a great experience that has enhanced my graduate education.*
- *The strengths of this course included hands-on learning, wide scope of coverage, careful planning of time and resources, lots of personal attention and social opportunities.*
- *I really liked the time spent with the IACUC discussion. Too often we overlook this part of animal investigations, yet it needs to be a pivotal part of all of our research.*
- *The elective work with an experienced researcher and the opportunity to personalize the design of the last days of the course were invaluable.*
- *I definitely have some new techniques I hope to employ in my research in the coming months, particularly the isolated tissue preparations.*
- *The effort of trying to create an informal setting for interaction with the invited guest lecturers over lunch and social activities was also admirable and very rewarding.*

FACULTY

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Principal Investigator
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University of Nebraska Medical Center

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Pharmacology and Pharmacy Sciences
Creighton University Medical Center

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University of Nebraska Medical Center

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Pharmacology
Creighton University Medical Center

Irving H. Zucker, PhD
Cellular and Integrative Physiology
University of Nebraska Medical Center

APPLICATION AND REGISTRATION PROCEDURE

Applications will be accepted until the course fills. Applications received on or before April 3, 2009, will be given priority consideration and qualify for a discounted registration fee. Successful applicants will be notified by email. Course registration is limited to 12, so early application is recommended.

UNMC Campus

Applicants for the course must provide:

1. A letter from the student's mentor or the employee's supervisor, briefly describing the applicant's background and indicating how this course will benefit the student or employee.
2. A letter from the applicant on the importance of the course for his/her career.

These items will be used to assess the suitability of applicants for the course. It is necessary that all applicants be actively involved in research and that this course be important for their current research project and/or their future career goals.

If accepted, the applicant is expected to attend the entire course. Arrival is on May 31, and departure is on June 13, 2009.

FEES

The registration fee includes course tuition, housing in the Clarkson College Residence Hall dorms, course materials, continental breakfast and lunch. The fee may be paid by check (made payable to the UNMC Center for Continuing Education) or by credit card. Payment must accompany the application. If the applicant is not accepted for the course, the payment will be returned. Fellowship support is available to help defray travel expenses and/or course registration fees based upon need.

CANCELLATION POLICY

Full refunds may be obtained if a written request is received by May 1, 2009. A $125 processing fee will be retained for cancellations after that time. No refunds will be given after May 18, 2009.

FOR FURTHER INFORMATION

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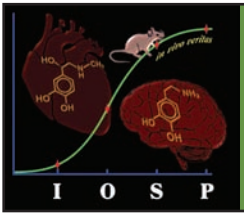
REGISTRATION FORM

CIK# 9983



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To register, complete and forward this form along with:

- ❒ Applicant letter
- ❒ Mentor/supervisor letter
- ❒ Payment

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Name		*SSN (last 4 digits)*
Degree		*Status* ❒ *Graduate Student* *Which year?* _____ ❒ *Post Doctoral* ❒ *Faculty* ❒ *Other* _____
Affiliation		
Mailing Address (Line 1)		
Mailing Address (Line 2)		*City/State/Zip*
Telephone	*Fax*	*Email Address*

REGISTRATION FEE:

- ❒ **$700** *(if application is received on or before April 3, 2009)*
- ❒ **$800** *(if application is received after April 3, 2009)*
- ❒ I prefer to arrange my own housing and receive a $100 discount

PAYMENT OPTIONS:

- ❒ Check or money order enclosed made payable to the UNMC Center for Continuing Education
- ❒ Charge to my
  - ❒ American Express ❒ MasterCard ❒ Visa
  - Card Number _____ Expiration Date _____
  - Cardholder's Name _____ Three Digit Verification Code _____
  - Signature _____

MAIL TO:

Center for Continuing Education
University of Nebraska Medical Center
986800 Nebraska Medical Center
Omaha, NE 68198-6800

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Toll Free: (877) 832-6924
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*Available Monday to Friday 9:00 AM-3:00 PM CST

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