IBS 761-Cancer Pharmacology Fall 2005-Course Syllabus 3 Credits

Meeting Time: Thursdays, 9:00 AM- 11:00AM

Location: New Winship Building, 1365-C Clifton Road, Room C5010

Course Director: Wei Zhou, Ph.D.
Winship Cancer Institute
Phone: 404-778-2134
Email: wei_zhou@emoryhealthcare.org

Course co-Director: Hyunsuk Shim, Ph.D.
Phone: 404-778-4564
Email: hyunsuk_shim@emory.org

Administrative Asst: Sharon Lauray, 404-778-5378,
Sharon_Lauray@emoryhealthcare.org

Required Text: The Anticancer Drugs, Second Edition, William B. Pratt, et al., Oxford University Press, 1994

CLASS SCHEDULE:

Week 1 (9-8)	**Introduction** (Brief history, Principles of drug targeting, milestones in anticancer drug development, principles of drug resistance)	**Dr. Van Meir**
Week 2 (9-15)	**Covalent/Non-Covalent DNA-binding Drugs** (Nitrogen Mustards, Aziridines, Platinum etc /anthracyclines, mitoxanthrone)	**Dr. Trent Spencer**
Week 3 (9-22)	**Antimetabolites** (Folate antagonists, pyrimidine/purine antagonists etc.)	**Dr. Wei Zhou**
Week 4 (9-29)	**Endocrine Therapy of Cancer** (glucocorticoids, estrogens, tamoxifen, androgens and anti-androgens, aromatase inhibitors, adrenocortical suppressors etc)	**Dr. Ruth O'Regan**
Week 5 (10-6)	**Microtubule Inhibitors** (microtubule-stabilizing drugs: taxol, epothilones etc; microtubule-destabilizing drugs: vinca alkaloids, cryptophycins etc)	**Dr. Adam Marcus**
Week 6 (10-13)	**Gene Therapy**	**Dr. Lily Yang**
Week 7 (10-20)	**Drug Discovery** (Model systems, high throughput screening, NCI Screen, Structure-based Drug Design)	**Dr. Dennis Liotta**
Week 8 (10-27)	**Mid-Term Exam**	
Week 9 (11-3)	**Cancer Chemoprevention/Clinical Trials Design**	**Dr. Fadlo Khuri**

(Translational aspects of cancer research; Phase I-III clinical trials; molecular endpoints)

Week 10 (11-10) **New "Molecular" Therapies I** **Dr. Haian Fu**
(tyrosine kinase inhibitors (Gleevec), raf kinase inhibitors, CDK inhibitors, proteasome inhibitors)

Week 11 (11-17) **Inhibitors of Chromatin function** **Dr. Paula Vertino**
(Topoisomerase inhibitors, etc)

Week 12 (11-24) **Thanksgiving**

Week 13 (12-1) **New "Molecular" Therapies II** **Dr. Hyunsuk Shim**
New molecular targeted therapies

Week 14 (12-8) **Drug Discovery II** **Dr. Wei Zhou**
(tumor fingerprinting using microarray technology and proteomics)

Week 15 (12-15) **Final Exam (9:00-12:30pm)**

The course will be organized such that the first hour and 15 minutes is a formal lecture on a particular aspect of Cancer Pharmacology followed by a 45 minute paper discussion session in which the students read, present and discuss a current research article selected by each instructor.

Prerequisites
The prerequisites for undergraduates will be undergraduate biochemistry or cell biology and the prerequisites for graduate students will be graduate course in biochemistry or cell biology.

Grading System:
Mid-Term Exam: In this written exam the students will summarize the pharmacology of three anticancer drugs to be selected from a list provided and answer selected questions from the lectures taken in the first part of the course. (40 % of final grade)
Final-Exam: The students will write one essay on one topic selected from the curriculum and graded by the appropriate instructor (40 % of final grade).
Student's paper presentations and participation in paper discussions will account for 20% of their final grade.

Description of the topic and Goals of the course
This course is designed to provide students with an overview of the fundamentals of pharmacology as applied to cancer therapy. The course will address molecular mechanisms of action to chemotherapeutic, antihormonal, and new experimental drugs. The mechanisms by which malignant cells become resistant to anticancer agents and ways to potentially overcome drug resistance will also be discussed. The topics covered in this course will range from traditional chemotherapy drugs to current concepts in cancer pharmacology. Model systems and molecular tools currently used to accelerate drug discovery and the cellular effects of newly designed compounds and their potential as anticancer agents in experimental systems are also included. **The goal of the course** is to familiarize the students with Current Concepts in Cancer Pharmacology Research. Research in Cancer Pharmacology can have two significant benefits: investigations which lead to a useful new drug or a new strategy for using an existing drug can be of great long-term benefit to mankind, and in addition such investigations often lead to elucidation of fundamental biochemical and physiological processes, thereby advancing the frontiers of basic knowledge.