

## **Seminar on History of Drugs Freshman Seminar**

### **Professor:**

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Office Hours: by appointment

### A Statement about Goals

An understanding of the history of drugs and chemicals is essential for the proper utility of these substances by the population at large. In spite of the fact that our knowledge of medicine and pesticide use increased exponentially since the 1950s, students in general are not familiar with the fascinating historical events and scientific stories associated with natural or synthetic substances. It is important to note that plants containing analgesic morphine, tetrahydro-cannabinol, bronchodilator ephedrine, and cardiotoxic glycosides were used by various cultures for centuries before pure, active, therapeutic constituents were isolated and chemically characterized. Parallel to these developments the science of human anatomy, physiology, biochemistry, and pharmacology advanced. Many scientists including Nobel Laureates contributed to Pharmacological Sciences. Better testing methods developed, and the causes of many diseases were better understood. Drug laws were instituted a century ago, and the Pharmaceutical industry flourished. The seminar presentation and discussions will include the panoramic view of when, where, who, how and why drugs were developed. The seminar series should expose students to the fascinating aspects of drug science. The student's curiosity, interest and enthusiasm will be fostered.

### Course Objectives

- Students will gain an understanding of the history of drugs, diseases, chemicals and therapeutics.
- Develop an essential breadth of knowledge in pharmacology.
- Students will know the historical key events, times, places and contributing scientists.
- To gain a historical perspective essential for deeper analysis of scientific knowledge. How decisions are made in promotion of drugs?
- The outline will provide essential foundations for the students entering professional or research careers in Life Sciences.

Prerequisite: High School General Science, physics, chemistry and physiology backgrounds needed. Viewers of National Geographic, Discovery, PBS, History Channels. Interest, curiosity, motivation and love of learning.

### Format

- 90-minute session each week with ~1 hour lecture
- Reading assignments and discussions (~30 minutes)
- Some short presentations by students
- Class size will be limited to 20 students

Credits: 2 hrs., meeting once a week, Autumn, 2006.

Grading: Pass/Non Pass grade based on oral or written quizzes, class participation and completion of assignments. Class attendance is essential. Students may select letter grade.

### **Tentative Seminar Schedule**

- Week 1 - Natural Botanical Legacy and related history.
  - The discovery of active chemical constituents
  - Early exchanges of Drugs & Diseases (~1600-1850 A.D.)
- Week 2 - Founders of Physiology and Pharmacology (1543 to 1900 A.D.)
- Week 3 - Hypnotics and Anesthetics (1800-1900 A.D.)
- Week 4 - Outline of the nervous system, transmitters and receptors
  - Drugs as a tool to probe the nervous system (1900 A.D.)
  - Drug standardization methods. Drug Laws (1906)
- Week 5 - Nobel prizes Physiology or Medicine (1901-2006)
  - Golden age of Pharmacology & Therapeutics
  - Growth of Pharmaceutical Industry (1800-2000)
- Week 6 - Student Presentations (10 min. oral presentation, 5 min. discussion; total of 6 students).
- Week 7 - Pesticides (pros 1940's and cons ~2000), preventative toxicology?
- Week 8 - Anticancer, antiviral drugs. Biotechnology, where is the cure?
- Week 9 - Student Presentations (10 min. oral, 5 min. discussion; total of 6 students)
- Week 10- Drug information, the search for truth, ethics, advertising, economics.  
Genetic idiosyncratic reactions, Dr. Andrew Weil and Dr. Deepak Chopra.  
The sensible health care!

### **Disability Services**

Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated, and should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Avenue; telephone: 292-3307, TDD 292-0901, <http://www.ods.ohio-state.edu>

## References

Patil, P.N., Gulati, O.D., Balaraman, R. (Editors) Topics in the History of Pharmacology, Distributor: Shah Prakashan, Ahmedabad, India, 2005. Pages, 294-320. A post graduate course in the History of Pharmacology and Drug Discovery, (reprints can be provided).

A class PowerPoint presentation document will be available (2006). Each topic contains notes with references.

Bender, G.A., and Thom, R.A. Great Moments in Pharmacy, Parke, Davis and Company. Northwood Institute Press, Detroit, 1966. Well illustrated, clear writing with timelines of drug development.

Modell, W., Lansing, A. and the Editors of Time-Life Books. Drugs, Time-Life Books, New York, 1967, 1972. A good reference! Easy to read, with a appendix on great scientists!

Holmstedt, B. and G. Liljestrand. Readings in Pharmacology, the McMillan Company, New York, 1963. Pages 1-61. Accurate early references and good connectivity with the development of the modern drug science.

Leake, C.D. An Historical Account of Pharmacology of the Twentieth Century, C.C. Thomas publishers, Springfield, Illinois, 1975. A great historian, Leake provided a wealth of information.

## General Reading

Krantz, John C., Jr. Historical Medical Classics Involving New Drugs, The Williams and Wilkins Company, Baltimore, 1974.

Sonnedecker, Glenn. History of Pharmacy, 4<sup>th</sup> Ed., J.B. Lippincott Company, Philadelphia, 1976.

Sneider, Walter. Drug Discovery: The Evolution of Modern Medicines, John Wiley and Sons, New York, 1985.

## Academic Misconduct

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee. For additional information, see the Code of Student Conduct ([http://studentaffairs.osu.edu/info\\_for\\_students/csc.asp](http://studentaffairs.osu.edu/info_for_students/csc.asp)).

## Partial List of Suggested Topics for Class Presentations (Autumn, 2006)

- History of Ohio based drug-chemical industry
  - Ross Laboratories
  - Pharmacia
  - Merrill Dow
  - Scotts Co. Chemicals
- History of perfumes, chemistry, physiology & therapeutics
- Aroma therapy
- Investigations on Angiogenesis & potential drugs
- Discovery of nitric oxide and its role in body functions
- History of LSD-like psychedelics
- Development of Paw Paw products for cancer
- Scientific history of frog skin toxins & potential uses
- 'Botox', when, why & where did it come from?
- Current antimalarials (*Molecular Interventions* v. 5, P. 269, **2005**)
- History of antiglaucoma drugs
- Who, when, where the nerve growth factor was discovered (*Scientific American* v. 240, P. 68, **1979**)
- The evolution of medicine (*Why We Get Sick, the new science of Darwinian medicine* by R.M. Nesse and G.C. Williams, Vintage Books, P. 961, N.Y. **1996**)
- Problems in drug discovery: From Test Tubes to Animals to Humans (*Nature Reviews Drug Discovery* v. 4, P. 961, Dec., **2005**)
- With approval of the instructor the student may select a different topic of their own choice.

## Biographical Sketch

Professor of Pharmacology, Popat N. Patil, has been on the campus with the College of Pharmacy for ~48 years where he obtained M.S. (1960) and Ph.D. (1963) from The Ohio State University. During this time, he taught Pharmacology to Pharmacy and Optometry students. His research interests include drug-antagonism, drug-receptor interactions, molecular asymmetry and drug activity, significance of drug melanin interactions, pharmacology of natural products and the history of pharmacology. In the research laboratory, he has mentored many undergraduate, graduate and post doctoral investigators leading to 200 plus publications including three books. His honors include the Balshone Teaching Award (1979), Kimberly Professor (1979-81), the Senior U.S. Scientist - Humboldt Award (1980), and Fellow of the American Association for the Advancement of Science. He has traveled from Stockholm to Sidney and Moscow to the West Indies learning and presenting the pharmacological sciences. He is located in 538 Parks Hall, College of Pharmacy, where he reads and writes. In his spare time he devotes activities to his laboratory research.