

DRUGS AND THE BRAIN
PSYC62 2003 (Wed Rm H-214; Fri Rm H-305)

Instructor: Prof Suzanne Erb
Office: S-540C
Office hours: Tues 3:30-5 pm or by appointment.
e-mail: use WebCT mail only.

Teaching Assistant: Vanessa Lopak; contact through WebCT mail.

Course description

Psychopharmacology is the study of the effects of drugs on behaviour, cognition, and emotion. There are many different classes of drugs that act within the central nervous system to alter behaviour, cognition and emotion. Some have been designed for the treatment of mental disorders such as schizophrenia and depression. Other drugs are known primarily for their social or recreational abuse potential. This course will provide an introduction to basic principles of psychopharmacology with a specific focus on drugs of abuse.

The course is divided into two parts. In Part I, we will work through the first 11 chapters of David Grilly's textbook, "Drugs and Human Behaviour". A range of topics pertinent to the study of psychopharmacology will be covered, including behavioural pharmacology and pharmacokinetics, neurobiological mechanisms of drug action, tolerance and dependence, and classification of psychotropic drugs. In addition, the behavioural and neurobiological effects of each of the major classes of drugs of abuse will be examined. Having established these basic principles and concepts, we will analyze in Part II of the course some of the theories and ideas that have been seminal in shaping and guiding the field of drug addiction research over the past several decades. The original theoretical papers and investigations will be discussed in the light of more recent research.

Textbook

David M. Grilly (2002) *Drugs and Human Behavior, Fourth Edition*. Boston, MA: Allyn & Bacon.

WebCT

All students must obtain a UTSC e-mail account. This is required to access the WebCT course page. WebCT will be used for posting of any lecture materials, posting of grades, general questions and e-mail (see guidelines for e-mail below), and all important class announcements. *Please get your e-mail accounts set up ASAP.* If you have any questions about WebCT or need assistance setting up an e-mail account, please see a staff member at the **Computing Centre Help Desk in room B463**. A WebCT demonstration will be given in the first class.

Guidelines for e-mail

Please use e-mail judiciously. Any general questions about course material, evaluation, etc should be posted in WebCT using the discussion link on the homepage, so that I can respond a single time to questions that more than one student is likely to have. Questions that you do not wish to post in this public forum, should be sent to me via WebCT mail; *please do not send mail to my personal e-mail account.*

Evaluation

Evaluation will be based on two term tests, each worth 25% of the final grade, and a final exam worth 50% of the final grade. The term tests will be written in class, consist of multiple choice, true/false, and short-answer questions, and be based on lecture and textbook material. The final exam will cover material from the second term test on; *however, it should be kept in mind that an understanding of Part II of the course requires a solid understanding of material covered in Part I.* The final exam will be comprised of true/false, short answer, and long answer questions.

SCHEDULE OF LECTURES

PART I

DATE	TOPIC	READINGS
Jan 8	Introduction to course	Ch. 1
Jan 10	Principles of Pharmacology	Ch. 2
Jan 15	Pharmacokinetics	Ch. 3
Jan 17	Neuronal conduction and transmission	Ch. 4
Jan 22	Neuroactive ligands	Ch. 5
Jan 24	Tolerance, dependence, and sensitization	Ch. 6
Jan 29	TERM TEST 1	Chapters 2-6
Jan 31	Drug classification	Ch. 7
Feb 5	Sedative-hypnotics and anxiolytics	Ch. 8
Feb 7	Psychostimulants	Ch. 9
Feb 12	Opioids	Ch. 10
Feb 14	Psychotomimetics, psychedelics, and hallucinogens	Ch. 11
Feb 17-21	READING WEEK	
Feb 26	TERM TEST 2	Chapters 7-11

PART II (assigned readings are listed on page 5 of the syllabus)

DATE	TOPIC	READINGS
Feb 28	An overview of major theoretical contributions shaping the study of drug addiction	
Mar 5	A compensatory conditioning theory of addiction	(Siegel, 1976; Siegel, 1979; Siegel, Hinson, Krank, & McCully, 1982)
Mar 7	Revisiting compensatory conditioning theory	(Sokolowska, Siegel, & Kim, 2002)
Mar 12	The Anhedonia hypothesis	(Wise, 1982)
Mar 14	Revisiting the Anhedonia hypothesis	(Salamone, Cousins, & Snyder, 1997)
Mar 19	Conditioned stimulus control of the expression of sensitization: PART I	(Stewart, 1992; Stewart, de Wit, & Eikelboom, 1984)
Mar 21	Conditioned stimulus control of the expression of sensitization: PART II	
Mar 26	An incentive-sensitization theory of addiction: PART I	(Robinson & Berridge, 1993)
Mar 28	An incentive-sensitization theory of addiction: PART II	
Apr 2	Hedonic homeostasis dysregulation in addiction	(Ahmed & Koob, 1998; Koob & Le Moal, 1997)
Apr 4	Drug addiction and allostasis	(Koob & Le Moal, 2001)

Assigned readings

** Articles will be posted on WebCT in pdf format, when possible. All articles will be available on reserve at the Bladen library, by Feb. 28.*

Ahmed, S., & Koob, G. (1998). Transition from moderate to excessive drug intake: change in hedonic set point. Science, 282, 298-300.

Koob, G., & Le Moal, M. (1997). Drug abuse: hedonic homeostatic dysregulation. Science, 278, 52-58.

Koob, G. F., & Le Moal, M. (2001). Drug addiction, dysregulation of reward, and allostasis. Neuropsychopharmacology, 24, 97-129.

Robinson, T. E., & Berridge, K. C. (1993). The neural basis of drug craving: an incentive-sensitization theory of addiction. Brain Research Reviews, 18, 247-291.

Salamone, J. D., Cousins, M. S., & Snyder, B. J. (1997). Behavioral functions of nucleus accumbens dopamine: Empirical and conceptual problems with the anhedonia hypothesis. Neuroscience and Biobehavioral Reviews, 21, 341-359.

Siegel, S. (1976). Morphine analgesic tolerance: Its situation specificity supports a Pavlovian conditioning model. Science, 193, 323-325.

Siegel, S. (1979). The role of conditioning in drug tolerance and addiction. In J. D. Keehn (Ed.), Psychopathology in Animals: Research and Clinical Implications (pp. 143-168). New York: Academic Press.

Siegel, S., Hinson, R. E., Krank, M. D., & McCully, J. (1982). Heroin "overdose" death: Contribution of drug-associated environmental cues. Science, 216, 436-437.

Sokolowska, M., Siegel, S., & Kim, J. A. (2002). Intraadministration associations: Conditional hyperalgesia elicited by morphine onset cues. Journal of Experimental Psychology: Animal Behavior Processes, 28, 309-320.

Stewart, J. (1992). Neurobiology of conditioning to drugs of abuse. In P. W. Kalivas & H. H. Samson (Eds.), The Neurobiology of Drug and Alcohol Addiction. Annals of the New York Academy of Sciences (Vol. 654, pp. 335-346). New York: New York Academy of Sciences.

Stewart, J., de Wit, H., & Eikelboom, R. (1984). Role of unconditioned and conditioned drug effects in the self-administration of opiates and stimulants. Psychological Review, 91, 251-268.

Wise, R. A. (1982). Neuroleptics and operant behavior: The anhedonia hypothesis. Behavioral and Brain Sciences, 5, 39-87.