

PSYC62HS 2004 DRUGS AND THE BRAIN
(Wed and Fri, 9-10 Rm H-214)

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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 context of more recent research.

Textbook

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

Accessing Course Materials

Course-related materials including course outline, lecture notes, class grades, and class announcements will be posted on the UTSC intranet. To access these materials, you *must* obtain a UTSC computer account. Setting up an account is very easy and is a *requirement* for this course as most course-related materials will not be available in any other format. The UTSC intranet will also allow you to access and send email, surf the internet, access information about all your other courses, etc. If you do not already have a UTSC computer account, please get one set up ASAP. If you have any questions about the UTSC intranet or need assistance setting up a computer account, please see a staff member at the **Computing Centre Help Desk in room B463**.

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 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 consist of short-answer and long essay questions.

SCHEDULE OF LECTURES

PART I

DATE	TOPIC	READINGS
Jan 7	Introduction to course	
Jan 9	Principles of Pharmacology	Ch. 2
Jan 14	Pharmacokinetics	Ch. 3
Jan 16	Neuronal conduction and transmission	Ch. 4
Jan 21	Neuroactive ligands I	Ch. 5
Jan 23	Neuroactive ligands II	Ch. 5
Jan 28	TERM TEST 1	Chapters 2-5
Jan 30	Neurobiology of Drug Reward Tolerance and Dependence	Ch. 6
Feb 4	Psychostimulants I	Ch. 9
Feb 6	Psychostimulants II	Ch. 9
Feb 11	Opioids	Ch. 10
Feb 13	Psychotomimetics, psychedelics, and hallucinogens	Ch. 11
Feb 16-20	READING WEEK	
Feb 25	TERM TEST 2	Chapters 6, 9-11

PART II - TENTATIVE SCHEDULE (assigned readings are listed on page 4 of the syllabus)

DATE	TOPIC	READINGS
Feb 27	An overview of major theoretical contributions shaping the study of drug addiction	
Mar 3	A compensatory conditioning theory of addiction	(Siegel, 1976; Siegel, 1979; Siegel, Hinson, Krank, & McCully, 1982)
Mar 5	Revisiting compensatory conditioning theory	(Sokolowska, Siegel, & Kim, 2002)
Mar 10	The Anhedonia hypothesis	(Wise, 1982)
Mar 12	Revisiting the Anhedonia hypothesis	(Salamone, Cousins, & Snyder, 1997)
Mar 17	Conditioned stimulus control of the expression of sensitization: PART I	(Stewart, 1992; Stewart, de Wit, & Eikelboom, 1984)
Mar 19	Conditioned stimulus control of the expression of sensitization: PART II	
Mar 24	An incentive-sensitization theory of addiction: PART I	(Robinson & Berridge, 1993)
Mar 26	An incentive-sensitization theory of addiction: PART II	
Mar 31	Hedonic homeostasis dysregulation in addiction	(Ahmed & Koob, 1998; Koob & Le Moal, 1997)
Apr 2	Drug addiction and allostasis	(Koob & Le Moal, 2001)

Assigned readings

Most articles will be posted on the UTSC intranet in PDF format. All articles will be available on reserve at the Bladen library by Feb. 27.

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.