CANNABIS

A Medical Dictionary, Bibliography, and Annotated Research Guide to Internet References

James N. Parker, M.D.
and Philip M. Parker, Ph.D., Editors
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Acknowledgements

The collective knowledge generated from academic and applied research summarized in various references has been critical in the creation of this book which is best viewed as a comprehensive compilation and collection of information prepared by various official agencies which produce publications on cannabis. Books in this series draw from various agencies and institutions associated with the United States Department of Health and Human Services, and in particular, the Office of the Secretary of Health and Human Services (OS), the Administration for Children and Families (ACF), the Administration on Aging (AOA), the Agency for Healthcare Research and Quality (AHRQ), the Agency for Toxic Substances and Disease Registry (ATSDR), the Centers for Disease Control and Prevention (CDC), the Food and Drug Administration (FDA), the Healthcare Financing Administration (HCFA), the Health Resources and Services Administration (HRSA), the Indian Health Service (IHS), the institutions of the National Institutes of Health (NIH), the Program Support Center (PSC), and the Substance Abuse and Mental Health Services Administration (SAMHSA). In addition to these sources, information gathered from the National Library of Medicine, the United States Patent Office, the European Union, and their related organizations has been invaluable in the creation of this book. Some of the work represented was financially supported by the Research and Development Committee at INSEAD. This support is gratefully acknowledged. Finally, special thanks are owed to Tiffany Freeman for her excellent editorial support.
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FORWARD

In March 2001, the National Institutes of Health issued the following warning: "The number of Web sites offering health-related resources grows every day. Many sites provide valuable information, while others may have information that is unreliable or misleading." Furthermore, because of the rapid increase in Internet-based information, many hours can be wasted searching, selecting, and printing. Since only the smallest fraction of information dealing with cannabis is indexed in search engines, such as www.google.com or others, a non-systematic approach to Internet research can be not only time consuming, but also incomplete. This book was created for medical professionals, students, and members of the general public who want to know as much as possible about cannabis, using the most advanced research tools available and spending the least amount of time doing so.

In addition to offering a structured and comprehensive bibliography, the pages that follow will tell you where and how to find reliable information covering virtually all topics related to cannabis, from the essentials to the most advanced areas of research. Public, academic, government, and peer-reviewed research studies are emphasized. Various abstracts are reproduced to give you some of the latest official information available to date on cannabis. Abundant guidance is given on how to obtain free-of-charge primary research results via the Internet. While this book focuses on the field of medicine, when some sources provide access to non-medical information relating to cannabis, these are noted in the text.

E-book and electronic versions of this book are fully interactive with each of the Internet sites mentioned (clicking on a hyperlink automatically opens your browser to the site indicated). If you are using the hard copy version of this book, you can access a cited Web site by typing the provided Web address directly into your Internet browser. You may find it useful to refer to synonyms or related terms when accessing these Internet databases. NOTE: At the time of publication, the Web addresses were functional. However, some links may fail due to URL address changes, which is a common occurrence on the Internet.

For readers unfamiliar with the Internet, detailed instructions are offered on how to access electronic resources. For readers unfamiliar with medical terminology, a comprehensive glossary is provided. For readers without access to Internet resources, a directory of medical libraries, that have or can locate references cited here, is given. We hope these resources will prove useful to the widest possible audience seeking information on cannabis.

The Editors

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1 From the NIH, National Cancer Institute (NCI): http://www.cancer.gov/cancerinfo/ten-things-to-know.
CHAPTER 1. STUDIES ON CANNABIS

Overview

In this chapter, we will show you how to locate peer-reviewed references and studies on cannabis.

The Combined Health Information Database

The Combined Health Information Database summarizes studies across numerous federal agencies. To limit your investigation to research studies and cannabis, you will need to use the advanced search options. First, go to http://chid.nih.gov/index.html. From there, select the “Detailed Search” option (or go directly to that page with the following hyperlink: http://chid.nih.gov/detail/detail.html). The trick in extracting studies is found in the drop boxes at the bottom of the search page where “You may refine your search by.” Select the dates and language you prefer, and the format option “Journal Article.” At the top of the search form, select the number of records you would like to see (we recommend 100) and check the box to display “whole records.” We recommend that you type “cannabis” (or synonyms) into the “For these words:” box. Consider using the option “anywhere in record” to make your search as broad as possible. If you want to limit the search to only a particular field, such as the title of the journal, then select this option in the “Search in these fields” drop box. The following is what you can expect from this type of search:

- Development of a Cannabis Education Program


  Summary: The Education Research Section of the Ontario Addiction Research Foundation has developed and pretested three lesson plans for a cannabis education program. There are two aspects to the cannabis use issue: (1) cannabis research has indicated that there are demonstrable adverse health effects from the use of even small amounts of cannabis and (2) cannabis use is illegal in Canada at the present time. Five health lessons were developed based on the health belief model, the legal deterrence model, and a combination of the two models. There is a certain parallelism between the two models. In each model, there is perceived (1) certainty of adverse consequences, (2) speed with which punishment would be evoked, and (3) severity of punishment. While pretesting the lesson plans with 23 classes of students in grades 7 through 10, students
overwhelmingly preferred the lesson plan based on the health belief model. 3 references.

- **Comparison of the Effects of Prenatal Exposure to Tobacco, Alcohol, Cannabis and Caffeine on Birth Size and Subsequent Growth**


  Summary: Researchers examined the effects of prenatal exposure on growth parameters of children assessed at birth, 12, and 25 months of age. Maternal use of cigarettes, alcohol, cannabis, and caffeine was established for four time periods: (1) Prepregnancy, (2) first trimester, (3) third trimester, and (4) average use over pregnancy. The relationship between such usage and growth parameters of offspring followed up from birth to 12 and 24 months of age was examined. The average age of women in this study was 28.9 years. The mean family income of $31,675.42 was nonsignificantly lower than the average family income of $36,000 for the Ottawa metropolitan area in 1981. The sample assessed at birth consisted of 667 newborns and their mothers. Of these, drugs and nicotine had the most pronounced effect. After adjustment for other relevant variables, nicotine use prior to and during pregnancy was negatively related to weight and head circumference at birth. Furthermore, third trimester nicotine use was a stronger predictor of decreased weight and head circumference at birth than was first trimester use. The results obtained are consistent with ponderal index (PI) literature, suggesting a recovery of growth retardation in infants with a lowered PI. Average consumption of greater than one ounce of absolute alcohol per day was negatively related to birth weight and length. Neither cannabis nor caffeine use had a significant negative effect on any growth parameter. 2 tables, 44 references.

- **Maternal Alcohol, Tobacco and Cannabis Consumption and the Outcome of Pregnancy**


  Summary: Researchers reported the findings of a study on the influence of maternal use of cannabis upon various outcomes of pregnancy while controlling for the influence of alcohol and tobacco use. The outcomes studied were low birthweight, prematurity, intrauterine growth retardation, presence of congenital abnormalities, perinatal death, low Apgar score, and delayed time to commencement of respiration. This prospective study of 7,301 births first controlled for maternal age and parity as these factors may influence pregnancy outcomes. In general, alcohol consumption was relatively moderate in this population. Forty percent of the women smoked, with 2.8 percent smoking more than 30 cigarettes a day; women who drank more alcohol also tended to smoke more. Only 5.4 percent of the women admitted to using cannabis. The results of this study showed that infants born to smokers had lower birthweights and were more prone to intrauterine growth retardation, but they did not appear to have an increased risk of prematurity or perinatal death. Only 36 women reported using cannabis two or more times a week, not merely as smokers of marijuana but also as users of the more potent resin forms of cannabis. Subsequently 25 percent of these women gave birth to premature infants. 4 tables, 19 references.
Federally Funded Research on Cannabis

The U.S. Government supports a variety of research studies relating to cannabis. These studies are tracked by the Office of Extramural Research at the National Institutes of Health. CRISP (Computerized Retrieval of Information on Scientific Projects) is a searchable database of federally funded biomedical research projects conducted at universities, hospitals, and other institutions.

Search the CRISP Web site at http://crisp.cit.nih.gov/crisp/crisp_query.generate_screen. You will have the option to perform targeted searches by various criteria, including geography, date, and topics related to cannabis.

For most of the studies, the agencies reporting into CRISP provide summaries or abstracts. As opposed to clinical trial research using patients, many federally funded studies use animals or simulated models to explore cannabis. The following is typical of the type of information found when searching the CRISP database for cannabis:

- **Project Title: CANNABIS AND SCHIZOPHRENIA: CLOzapine VS RISPERIDone**

  Principal Investigator & Institution: Green, Alan I. Psychiatry; Harvard University (Medical School) Medical School Campus Boston, Ma 02115

  Timing: Fiscal Year 2002; Project Start 0-SEP-2000; Project End 0-NOV-2004

  Summary: (Applicant's Abstract) Cannabis use disorder contributes to the morbidity of schizophrenia, leading to, poorer overall functioning. The typical antipsychotic drugs are of limited value in controlling cannabis use in these "dual diagnosis" patients. This study will assess whether new antipsychotic medications, introduced into clinical practice in the past decade, are of value for this purpose. Preliminary data suggest that the atypical antipsychotic drug clozapine (CLOZ), currently used primarily for treatment resistant patients, may limit cannabis use in "dual diagnosis" patients with schizophrenia much more effectively than do either typical antipsychotics or the "novel" (post-CLOZ) antipsychotic risperidone (RISP). In a recently published paper, we have hypothesized (a) that CLOZ will lessen substance use in such "dual diagnosis" patients in part because of its mechanism of action that includes release of dopamine (DA) in the prefrontal cortex (PFC), and (b) that the CLOZ-induced release of DA in the PFC will decrease negative symptoms (an effect shared especially by the novel antipsychotic RISP). Moreover, we have further hypothesized, (c) that through its diverse effects on both dopaminergic and noradrenergic systems, CLOZ (but not RISP or typical antipsychotics) will help to normalize dysfunctional brain reward circuits that may underlie the comorbid substance use in patients with schizophrenia. In the proposed study, patients comorbid for both schizophrenia and a cannabis use disorder will be randomly assigned to double-blind treatment (for 12 weeks) with either CLOZ or RISP. The primary aim of this study is to launch a carefully controlled pharmacological trial of the short-term effects of CLOZ and RISP on cannabis use in this population to test the hypothesis that patients treated with CLOZ will have decreases in cannabis use as compared to patients treated with RISP. A secondary aim is to begin to investigate the process by which CLOZ produces its effects on cannabis use through study of negative symptoms. A subsidiary aim is to begin to address key auxiliary measures of the effects

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2 Healthcare projects are funded by the National Institutes of Health (NIH), Substance Abuse and Mental Health Services (SAMHSA), Health Resources and Services Administration (HRSA), Food and Drug Administration (FDA), Centers for Disease Control and Prevention (CDCP), Agency for Healthcare Research and Quality (AHRQ), and Office of Assistant Secretary of Health (OASH).
of CLOZ in this "dual diagnosis" population: psychiatric symptoms, quality of life, and measures of neuropsychological functions. If the results of this study confirm the preliminary data, they could suggest a new use for CLOZ, one that could have important public health implications.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: FMRI AND COGNITION IN ADOLESCENT MDMA AND CANNABIS USERS**
  
  Principal Investigator & Institution: Tapert, Susan F. Assistant Professor; Veterans Medical Research Fdn/San Diego Foundation of San Diego San Diego, Ca 92161
  
  Timing: Fiscal Year 2003; Project Start 1-MAY-2003; Project End 0-APR-2006
  
  Summary: (provided by applicant): The goal of this exploratory developmental project is to better understand the degree to which use of +/- 3,4-methylenedioxymethamphetamine (MDMA or "ecstasy") and cannabis during late adolescence affect brain functioning. Marijuana and MDMA are used relatively widely in the United States and Western Europe with rates increasing particularly for adolescents. Animal models have suggested adverse brain changes associated with MDMA use. Although some human studies have shown neurocognitive deficits among MDMA users, these reports have been challenged by inadequately matched comparison groups, particularly with regards to other substance use, and recent substance use. Additionally, it is unknown how use of these substances during adolescent neuromaturational processes affect brain functioning and thinking abilities. Since most users of MDMA take other substances as well, a drug-using comparison group appears appropriate. The current proposal compares brain functioning using functional magnetic resonance imaging (fMRI) and neuropsychological (NP) performance between 3 groups of 16 to 18 year old adolescents: 1) users of MDMA and marijuana, 2) users of marijuana only, and 3) nonusers. Youth will be recruited from local high schools (N=9000) during twice-annual school-wide surveys conducted as part of another ongoing research project. Testing will take place after >28 days of abstinence from MDMA, cannabis, and other substance, confirmed by frequent toxicology screening in the four weeks before assessment. Results from this study will also be compared to those of alcohol use disordered adolescents in our current fMRI and NP studies. Based on animal models and existing data in humans, it is hypothesized that the MDMA+marijuana group will show a greater degree of abnormality on these measures than the marijuana only group or the non-using control group. We predict that cognitive performances related to serotonergic functioning, such as memory and impulsivity, will be particularly abnormal, with corresponding fMRI response decreases in prefrontal, orbitofrontal, and medial temporal cortices during tasks requiring these areas. A secondary aim of this project is to refine assessment methods by developing procedures for establishing 28 days of sobriety in youth and validating measures of intoxication and post-intoxication effects to help ascertain the pharmacology of drugs taken by teens.
  
  Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: NEUROBIOLOGY OF CANNABIS BEHAVIORAL EFFECTS**
  
  Principal Investigator & Institution: D'souza, D C. Psychiatry; Yale University 47 College Street, Suite 203 New Haven, Ct 065208047
  
  Timing: Fiscal Year 2001; Project Start 5-MAR-2001; Project End 9-FEB-2004
  
  Summary: (Adapted from Applicant's Abstract): Comorbid cannabis abuse has a significant negative impact on the course and treatment of schizophrenia. Comorbid
cannabis abuse is highly prevalent in schizophrenia and schizophrenics prefer cannabis to other illicit drugs. There are no pharmacological studies characterizing the effects of cannabis in schizophrenics. The existing literature is limited by its exclusive reliance on naturalistic, retrospective self-report studies. These studies suggest that cannabis may reduce certain symptoms associated with schizophrenia at the expense of worsening others. Studying the effects of cannabis on the symptoms of schizophrenia is the first step in understanding the problem of cannabis abuse and schizophrenia. Cannabis continues to be a public health problem in the general population. While an association between cannabis use and psychosis in "healthy" individuals has been reported, the magnitude of cannabis' psychogenic effects has not been adequately studied using standardized assessments. This investigation proposes to answer the following questions: 1. Does THC have anxiolytic and euphoric effects in schizophrenia? 2. Is there altered cannabinoid sensitivity in schizophrenia: does THC increase psychosis and cognitive deficits in schizophrenics, is THC psychogenic in controls and finally, are schizophrenics more vulnerable to the effects of THC? Study subjects will be stable schizophrenics with previous cannabis exposure and matched controls. They will be tested under three conditions: placebo, 2.5 and 5mg THC delivered IV. Primary outcome measures are: PANSS, Visual Analogue Scale for Mood Disorders, CADSS (perceptual alteration scale) and tests sensitive to frontal and temporal cortical function. Secondary measures include measures of drug liking, movement rating scales and long term follow-up assessment of cannabis use.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title:** NICE (NEUROCOGNITIVE INDEX OF CANNABIS EFFECTS) SYSTEM

Principal Investigator & Institution: Gevins, Alan S. President; Sam Technology, Inc. 425 Bush St, 5Th Fl San Francisco, Ca 94108

Timing: Fiscal Year 2001; Project Start 0-SEP-1999; Project End 1-AUG-2003

Summary: (provided by applicant) The decriminalization of medicinal marijuana in numerous states has increased the demand for research on how marijuana affects patients. Unfortunately, there is currently no standard means for assessing the cognitive and neurophysiological changes resulting from marijuana smoking. Accordingly, we propose to develop a self-contained device, the NICE (Neurocognitive Index of Cannabis Effects) system, to objectively and efficiently assess marijuana-related changes in cognitive brain function. In Phase I we collected data from ten recreational marijuana users before and after the smoked marijuana cigarettes containing an active or a placebo dose of THC. After smoking marijuana subjects were less accurate in a test of intermediate-term memory, and responses in a sustained attention/working memory task were slower. Marijuana produced large concomitant changes in task-related EEG and event-related potentials. Multivariate combinations of performance and neurophysiological measures readily tracked the neurocognitive changes following marijuana smoking. The Phase I project also contributed to the ongoing design of a compact and highly automated testing and analysis system. In Phase II we propose to extend and further validate our procedures for classifying marijuana's effects on an individual basis using a larger database, fully implement a prototype system, and subject it to independent evaluation studies. PROPOSED COMMERCIAL APPLICATION: Not Available

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen
**Project Title: PRENATAL CANNABIS & CIGARETTE EXPOSURE - OUTCOME**

Principal Investigator & Institution: Fried, Peter A. Professor; Carleton University 1125 Colonel by Drive Ottawa,

Timing: Fiscal Year 2002; Project Start 1-APR-1988; Project End 0-JUN-2005

Summary: (provided by applicant): Since 1978, a longitudinal study -- the Ottawa Prenatal Prospective Study (OPPS) -- has been investigating a low risk population, the effects of marihuana and cigarettes used during pregnancy. The general objectives of this competitive renewal are twofold and take advantage of the age of the OPPS subjects (20-23 years) who have been assessed since birth. We will continue to assess the young adults focusing upon the domains impacted by either prenatal marihuana or cigarettes at younger ages and examine the predictive validity of the infant and early childhood tests in terms of the continuity of effects over two decades. The second thrust of the proposed work will be to examine parameters related to regular marihuana use by the OPPS offspring, the evaluation of such use upon cognitive performance and an investigation of possible effects after prolonged cessation of regular usage. We have identified, via self-report and urinalysis, that approximately 30 percent of the OPPS 16 1/2 to 19 year old subjects are using marihuana on at least a weekly basis and have been doing so for a year or more. Approximately 20 percent in this age range have used marihuana to that extent in the past but have quit for at least six months. Among these past and present users over half averaged at least 5 joints per week. By using both within and between subject comparisons we will address such question as: whether there are predrug cognitive differences between non-users and future users; whether there is an impact upon cognitive performance that persists beyond the acute intoxication phase either while there may be a drug residue lingering in the CNS or well after such a residue has been cleared. We have the unique opportunity to examine, for the first time within the same subjects, cognitive performance before the initiation of regular marihuana use, during such use and after prolonged cessation. The low-risk nature of the OPPS sample, the vast array of background information, and the longitudinal neuropsychological data spanning infancy to young permits an examination of both the etiology of marihuana use and the consequences on cognitive performance in a manner identified by many researchers as being the pragmatically optimal protocol.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

**Project Title: RESIDUAL COGNITIVE EFFECTS OF CANNABIS--AN FMRI STUDY**

Principal Investigator & Institution: Yurgelun-Todd, Deborah A. Director, Cognitive Neuroimaging Laborat; Mc Lean Hospital (Belmont, Ma) Belmont, Ma 02478

Timing: Fiscal Year 2001; Project Start 0-MAY-1999; Project End 0-APR-2003

Summary: Despite the widespread use of marijuana, relatively little is known about the long term effects of the drug on neurocognitive and neurophysiologic function. The proposed investigation emerges from our studies of neuropsychological effects of marijuana in college students and adults, as well as from our previous investigations utilizing neuropsychological paradigms and functional magnetic resonance imaging (fMRI) to assess changes in regional cerebral activity in response to cognitive challenges. Neuropsychological assessments indicate that selected cortical functions, especially attentional and memory processing, are diminished after heavy cannabis use. Moreover, we have recently studied chronic marijuana smokers after a 28 day abstinence period, and found that performance on measures of memory and attention remained significantly reduced. The neural mechanisms underlying these cognitive deficits, the
extent to which these functions may recover, and the time course of recovery remain to be clarified. To date, no study has incorporated focal neuroimaging using cognitive challenge paradigms and a lengthy period of monitored abstinence from the drug. Fast scan, fMRI techniques have increased the spatial and temporal for functional imaging beyond what has previously been available. We now propose to examine regional cerebral activation during cortical challenge paradigms in three study groups following 1 and 28 days of a monitored abstinence from marijuana. The three study groups will be comprised of 60 current heavy long-term smokers of marijuana, 60 former heavy long-term smokers of marijuana, and 60 light smokers of marijuana. This project will provide important new information regarding the type, presence, and magnitude of the effects of cannabis on brain function. Further, the identification of neural processes which demonstrate improvements in cognitive activation following abstinence may be critical for the development of intervention strategies, the design of new treatments, and decisions regarding public policy.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

E-Journals: PubMed Central

PubMed Central (PMC) is a digital archive of life sciences journal literature developed and managed by the National Center for Biotechnology Information (NCBI) at the U.S. National Library of Medicine (NLM). Access to this growing archive of e-journals is free and unrestricted. To search, go to http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=Pmc, and type “cannabis” (or synonyms) into the search box. This search gives you access to full-text articles. The following is a sample of items found for cannabis in the PubMed Central database:


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3 Adapted from the National Library of Medicine: http://www.pubmedcentral.nih.gov/about/intro.html.
4 With PubMed Central, NCBI is taking the lead in preservation and maintenance of open access to electronic literature, just as NLM has done for decades with printed biomedical literature. PubMed Central aims to become a world-class library of the digital age.
5 The value of PubMed Central, in addition to its role as an archive, lies in the availability of data from diverse sources stored in a common format in a single repository. Many journals already have online publishing operations, and there is a growing tendency to publish material online only, to the exclusion of print.

• **Drinking, cannabis use and driving among Ontario students.** by Adlaf EM, Mann RE, Paglia A. 2003 Mar 4; http://www.pubmedcentral.gov/articlerender.fcgi?tool=pmcentrez&artid=149249

• **High times for cannabis research.** by Iversen L. 1999 May 11; http://www.pubmedcentral.gov/articlerender.fcgi?tool=pmcentrez&artid=33571


• **Marijuana: federal smoke clears, a little.** by [No authors listed]; 2001 May 15; http://www.pubmedcentral.gov/articlerender.fcgi?tool=pmcentrez&rendertype=external&artid=81049

• **Medical marijuana to sell for $5 per gram.** by Sibbald B. 2003 Aug 5; http://www.pubmedcentral.gov/articlerender.fcgi?tool=pmcentrez&rendertype=external&artid=167129

• **Much ado about marijuana.** by Carranza J. 2001 Sep 4; http://www.pubmedcentral.gov/articlerender.fcgi?tool=pmcentrez&rendertype=external&artid=81400

• **Much ado about marijuana.** by Voth EA. 2001 Sep 4; http://www.pubmedcentral.gov/articlerender.fcgi?tool=pmcentrez&rendertype=external&artid=81398

• **Much ado about marijuana.** by Hajela R. 2001 Sep 4; http://www.pubmedcentral.gov/articlerender.fcgi?tool=pmcentrez&rendertype=external&artid=81397


### The National Library of Medicine: PubMed

One of the quickest and most comprehensive ways to find academic studies in both English and other languages is to use PubMed, maintained by the National Library of Medicine. The advantage of PubMed over previously mentioned sources is that it covers a greater number of domestic and foreign references. It is also free to use. If the publisher has a Web

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* PubMed was developed by the National Center for Biotechnology Information (NCBI) at the National Library of Medicine (NLM) at the National Institutes of Health (NIH). The PubMed database was developed in conjunction with publishers of biomedical literature as a search tool for accessing literature citations and linking to full-text journal articles at Web sites of participating publishers. Publishers that participate in PubMed supply NLM with their citations electronically prior to or at the time of publication.
site that offers full text of its journals, PubMed will provide links to that site, as well as to sites offering other related data. User registration, a subscription fee, or some other type of fee may be required to access the full text of articles in some journals.

To generate your own bibliography of studies dealing with cannabis, simply go to the PubMed Web site at [http://www.ncbi.nlm.nih.gov/pubmed](http://www.ncbi.nlm.nih.gov/pubmed). Type “cannabis” (or synonyms) into the search box, and click “Go.” The following is the type of output you can expect from PubMed for cannabis (hyperlinks lead to article summaries):

- **“A study of chronic cannabis users in Varanasi”**.
  Author(s): Das Gupta SM, Srivastava GP, Singh LN, Tripathi CB.

- **A 12-step treatment approach for marijuana (Cannabis) dependence.**
  Author(s): Miller NS, Gold MS, Pottash AC.

- **A cannabis registry.**
  Author(s): Milman DH.

- **A case for cannabis.**
  Author(s): Flynn P.

- **A case for cannabis?**
  Author(s): Tylden E, Wild D.

- **A chromatographic comparison of the constituents of nutmeg and mace (Myristica fragrans Houtt.) with those of marihuana and hashish (Cannabis sativa L.).**
  Author(s): Forrest JE, Heacock RA.
• **A clinical sign for persistent harmful cannabis abuse?: a pilot study.**  
  Author(s): Turkson SN, Obeng-Bekoe O, Asamoah V.  

• **A community survey of adverse effects of cannabis use.**  
  Author(s): Thomas H.  

• **A comparison of olanzapine with haloperidol in cannabis-induced psychotic disorder: a double-blind randomized controlled trial.**  
  Author(s): Berk M, Brook S, Trandafir AI.  

• **A comparison of the effects of prenatal exposure to tobacco, alcohol, cannabis and caffeine on birth size and subsequent growth.**  
  Author(s): Fried PA, O’Connell CM.  

• **A 'demand side' estimate of the dollar value of the cannabis black market in New Zealand.**  
  Author(s): Wilkins C, Bhatta K, Casswell S.  

• **A dramatic response to inhaled cannabis in a woman with central thalamic pain and dystonia.**  
  Author(s): Chatterjee A, Almahrezi A, Ware M, Fitzcharles MA.  

• **A fatal motor-car accident and cannabis use. Investigation by radioimmunoassay.**  
  Author(s): Teale D, Marks V.  
• A flicker paradigm for inducing change blindness reveals alcohol and cannabis information processing biases in social users.
  Author(s): Jones BT, Jones BC, Smith H, Copley N.

• A further comparison of cannabis (marijuana) users and non-users.
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  Author(s): Tumosa CS.

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  Author(s): McGee R, Williams S, Poulton R, Moffitt T.

• A longitudinal study of the effects of adolescent cannabis use on high school completion.
  Author(s): Lynskey MT, Coffey C, Degenhardt L, Carlin JB, Patton G.

• A longitudinal study of the effects of tobacco and cannabis exposure on lung function in young adults.
  Author(s): Taylor DR, Fergusson DM, Milne BJ, Horwood LJ, Moffitt TE, Sears MR, Poulton R.

• A molecular basis of the therapeutic and psychoactive properties of cannabis (delta9-tetrahydrocannabinol).
  Author(s): Nahas G, Harvey DJ, Sutin K, Turndorf H, Cancro R.
- **A note on the use of Cannabis Sativa in the 17th century (Engelbert Kaempfer).**
  Author(s): Dolan JP.

- **A positive THC urinalysis from hemp (Cannabis) seed oil.**
  Author(s): Callaway JC, Weeks RA, Raymon LP, Walls HC, Hearn WL.

- **A preliminary controlled study to determine whether whole-plant cannabis extracts can improve intractable neurogenic symptoms.**
  Author(s): Wade DT, Robson P, House H, Makela P, Aram J.

- **A random survey of cannabis use in young people.**
  Author(s): Evans M, Stevens S, Samuel P.

- **A random walk through a cannabis field.**
  Author(s): Mechoulam R, Devane WA, Breuer A, Zahalka J.

- **A randomized controlled trial of brief cognitive-behavioral interventions for cannabis use disorder.**
  Author(s): Copeland J, Swift W, Roffman R, Stephens R.
  Source: Journal of Substance Abuse Treatment. 2001 September; 21(2): 55-64; Discussion 65-6.

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  Author(s): Willner P.

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  Author(s): Co BT, Goodwin DW, Gado M, Mikhail M, Hill SY.
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• **Activity of cannabis in relation to its delta'-trans-tetrahydro-cannabinol content.**
  Author(s): Fairbairn JW, Pickens JT.

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  Author(s): Farnsworth DL.

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  Author(s): von Sydow K, Lieb R, Pfister H, Hofler M, Wittchen HU.
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CHAPTER 2. NUTRITION AND CANNABIS

Overview

In this chapter, we will show you how to find studies dedicated specifically to nutrition and cannabis.

Finding Nutrition Studies on Cannabis

The National Institutes of Health’s Office of Dietary Supplements (ODS) offers a searchable bibliographic database called the IBIDS (International Bibliographic Information on Dietary Supplements; National Institutes of Health, Building 31, Room 1B29, 31 Center Drive, MSC 2086, Bethesda, Maryland 20892-2086, Tel: 301-435-2920, Fax: 301-480-1845, E-mail: ods@nih.gov). The IBIDS contains over 460,000 scientific citations and summaries about dietary supplements and nutrition as well as references to published international, scientific literature on dietary supplements such as vitamins, minerals, and botanicals.7

As a service of the ODS, access to the IBIDS database is available free of charge at the following Web address: http://ods.od.nih.gov/databases/ibids.html. After entering the search area, you have three choices: (1) IBIDS Consumer Database, (2) Full IBIDS Database, or (3) Peer Reviewed Citations Only.

Now that you have selected a database, click on the “Advanced” tab. An advanced search allows you to retrieve up to 100 fully explained references in a comprehensive format. Type “cannabis” (or synonyms) into the search box, and click “Go.” To narrow the search, you can also select the “Title” field.

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7 Adapted from http://ods.od.nih.gov. IBIDS is produced by the Office of Dietary Supplements (ODS) at the National Institutes of Health to assist the public, healthcare providers, educators, and researchers in locating credible, scientific information on dietary supplements. IBIDS was developed and will be maintained through an interagency partnership with the Food and Nutrition Information Center of the National Agricultural Library, U.S. Department of Agriculture.
The following information is typical of that found when using the “Full IBIDS Database” to search for “cannabis” (or a synonym):

- **Effect of Cannabis sativa on prolactine hormone of male dogs.**
  Author(s): Cairo Univ. (Egypt). Faculty of Veterinary Medicine
  Summary: chien male cannabis prolactine reproduction sexuee hormone serum sanguin medicament technique radioimmunologique

Additional physician-oriented references include:

- **A comparative study of the dose-response relationship of alcohol and cannabis on human skills performance.**

- **A comparison of olanzapine with haloperidol in cannabis-induced psychotic disorder: a double-blind randomized controlled trial.**
  Author(s): Department of Psychiatry, University of the Witwatersrand Medical School, Parktown, South Africa. 039berk@chiron.wits.ac.za
  Source: Berk, M Brook, S Trandafir, A I Int-Clin-Psychopharmacol. 1999 May; 14(3): 177-80 0268-1315

- **A longitudinal study of cannabis use and mental health from adolescence to early adulthood.**
  Author(s): Department of Preventive & Social Medicine, University of Otago Medical School, Dunedin, New Zealand.

- **Advanced high pressure liquid chromatography (HPLC) method for the analysis of cannabinoids in Cannabis sativa L.**

- **Adverse psychic effects of cannabis—with special focus on the situation in Sweden.**

- **Age and alcohol, marijuana and hard drug use.**

- **Age-related suppression of murine lymphoid cell blastogenesis by marijuana components.**
  Author(s): Department of Microbiology and Immunology, University of South Florida College of Medicine, Tampa 33612-4799.
• Analysis of cannabis samples confiscated in the Oxford area in 1975 and 1977 and of a preparation of “tincture of Cannabis”.

• Animal models of opiate, cocaine, and cannabis use.
  Author(s): Department of Developmental Psychobiology, Columbia University College of Physicians and Surgeons, New York, New York.

• Breastfeeding and the use of recreational drugs--alcohol, caffeine, nicotine and marijuana.
  Author(s): lgl@internetnorth.com.au

• Cannabidiol, a non-psychoactive component of cannabis and its synthetic dimethylheptyl homolog suppress nausea in an experimental model with rats.
  Author(s): Department of Psychology, Wilfrid Laurier University, Waterloo, Ontario N2L 3C5, Canada.

• Cannabis and cannabinoid receptors.
  Author(s): Department of Experimental Pharmacology, University of Naples Federico II via D. Montesano 49, Naples, Italy.
  Source: Nocerino, E Amato, M Izzo, A A Fitoterapia. 2000 August; 71 Suppl 1: S6-12 0367-326X

• Cannabis and cannabinoids: pharmacology and rationale for clinical use.
  Author(s): Institute of Biomedical Sciences, Aberdeen, Scotland. rgp@aberdeen.ac.uk
  Source: Pertwee, R G Forsch-Komplementarmed. 1999 October; 6 Suppl 312-5 1021-7096

• Cannabis and endogenous cannabinoid systems.
  Author(s): Department of Physiology and Pharmacology, Wake Forest University School of Medicine, Winston-Salem, NC 27157, USA. childers@bgsm.edu

• Cannabis chemistry, biochemistry and therapeutic applications—an overview.

• Cannabis condemned: the proscription of Indian hemp.
  Author(s): Department of Psychiatry, University of Edinburgh, Royal Edinburgh Hospital, 3 West Castle Road, Edinburgh EH10 5AT, Scotland, UK.
  Source: Kendell, R Addiction. 2003 February; 98(2): 143-51 0965-2140
• **Cannabis dependence and tolerance production.**  
Author(s): Department of Pharmacology and Toxicology, Medical College of Virginia, Virginia Commonwealth University, Richmond 23298.  

• **Cannabis dependence, withdrawal, and reinforcing effects among adolescents with conduct symptoms and substance use disorders.**  
Author(s): Department of Psychiatry, University of Colorado School of Medicine, Denver 80262, USA.  

• **Cannabis for chronic pain: case series and implications for clinicians.**  
Author(s): McGill University Health Centre-Montreal General Hospital Pain Centre, Montreal, Canada. mark.ware@muhc.mcgill.ca  

• **Carbamazepine as an adjunct in the treatment of schizophrenia-like psychosis related to cannabis abuse.**  
Author(s): Department of Psychiatry, Heinrich Heine University Duesseldorf, Germany. leweke@uni-duesseldorf.de  

• **Characterisation of cannabis plants phenotypes from illegal cultivations in Crete.**  
Author(s): Laboratory of Toxicology, Medical School, University of Crete, Heraklion, Greece.  
Source: Tsatsakis, A M Tutudaki, M Stiakakis, I Dimopoulou, M Tzatzarakis, M Michalodimitrakis, M Boll-Chim-Farm. 2000 May-June; 139(3): 140-5 0006-6648

• **Clinical psychiatric complications of cannabis use: an update.**  

• ** Constituents of Cannabis sativa L. XXVI. The delta-9-tetrahydrocannabinol content of confiscated marijuana, 1974-1983.**  

• **Correlates of alcohol and Marijuana use among junior high school students: family, peers, school problems, and psychosocial concerns.**  

• **Current perspectives on the medical use of marijuana.**  
Author(s): Millennium Strategies, 418 N. Westfield Rd., Madison, WI 53717, USA. PamelaBean@home.com  
- Delat9-tetrahydrocannabinol content in cannabis plants of greek origin.  
  Author(s): Department of Forensic Medicine and Toxicology, University of Athens, Medical School, Greece. sathan@cc.uoa.gr  

- Developmental changes in peer factors and the influence on marijuana initiation among secondary school students.  

- DNA fingerprinting of Cannabis sativa using inter-simple sequence repeat (ISSR) amplification.  
  Author(s): Izu Experimental Station for Medicinal Plants, National Institute of Health Sciences, Japan. kojoma@postman.riken.go.jp  

- Effects of cannabis and tobacco on the enzymes of alcohol metabolism in the rat.  
  Author(s): Department of Pharmacology, Medical School, University of Ioannina, Greece.  

- Effects on fetal development of maternal marijuana use during pregnancy.  

- Identification of DNA markers linked to the male sex in dioecious hemp (Cannabis sativa L.).  

- Intraspecific variation in Cannabis sativa L. based on intergenic spacer region of chloroplast DNA.  
  Author(s): Izu Experimental Station for Medicinal Plants, National Institute of Health Sciences, Shizouka, Japan. kohjyou@nihs.go.jp  

- Investigating the age effects of family structure on adolescent marijuana use.  

- Kif in the Rif: a historical and ecological perspective on marijuana, markets, and manure in northern Morocco.  
  Author(s): Georgetown University, Washington, D.C.  

- Looking back at Cannabis research.  
  Author(s): Hebrew University, Medical Faculty, Department of Medicinal Chemistry and Natural Products, Jerusalem, 91120, Israel. mechou@cc.huji.ac.it
Making sense of medical marijuana.
Author(s): Phoenix House Foundation, New York, USA.

Marijuana and cannabis: research why the conflict.

Marijuana and the media.

Marijuana smoke production and delivery system.

Medical efficacy of cannabinoids and marijuana: a comprehensive review of the literature.
Author(s): Department of Medicine, University of Calgary, Alberta, Canada.

Medical marijuana. Advocates file suit to seek new vote in District of Columbia.
Source: Anonymous AIDS-Policy-Law. 2002 February 1; 17(2): 6 0887-1493

Medicinal cannabis--hoax or hope?
Author(s): Department of Anaesthesia and Pain Management, The University of Sydney at the Royal North Shore Hospital, St Leonards, NSW, Australia. lmather@med.usyd.edu.au

Medicinal use of cannabis: history and current status.
Author(s): Department of Pharmacology, University of Toronto, Toronto, Ontario, Canada. harold.kalant@utoronto.ca

Medicinal use of marijuana. Is the debate a smoke screen for movement toward legalization?
Author(s): Southern Illinois University School of Law, Carbondale 62901, USA.

Nail analysis for drugs of abuse: extraction and determination of cannabis in fingernails by RIA and GC-MS.
Author(s): Department of Forensic Medicine and Science, University of Glasgow, Scotland.
Source: Lemos, N P Anderson, R A Robertson, J R J-Anal-Toxicol. 1999 May-June; 23(3): 147-52 0146-4760
• Neuroprotection by Delta9-tetrahydrocannabinol, the main active compound in marijuana, against ouabain-induced in vivo excitotoxicity.
  Author(s): Department of Bio-Organic Chemistry, Bijvoet Center for Biomolecular Research, 3584 CH, Utrecht University, Utrecht, The Netherlands.

• Pain: no medical necessity defense for marijuana to controlled substances act.

• Paroxysmal atrial fibrillation in a young female patient following marijuana intoxication—a case report of possible association.
  Author(s): Department and Division of Internal Medicine and Cardiology, Medical University, ul. Banacha 1a, 02-097 Warsaw, Poland.

• Perceived vs. actual friends’ use of alcohol cigarettes, marijuana, and cocaine: Which has the most influence.

• Progressive arteritis associated with cannabis use.
  Author(s): Department of Surgery, St Thomas' Hospital, London, U.K.

• Proposed resolution concerning therapeutic marijuana.

• Psychological effects of cannabis in adolescence.

• Psychopharmacological effects of cannabis.
  Author(s): Warneford Hospital, Oxford.

• Psychotic disorders among inpatients with abuse of cannabis, amphetamine and opiates. Do dopaminergic stimulants facilitate psychiatric illness?
  Author(s): Department of Clinical Neuroscience, Psychiatry Section, Huddinge Hospital, Huddinge, Sweden.
  Source: Dalmau, A Bergman, B BrisMarch, B Eur-Psychiatry. 1999 November; 14(7): 366-71 0924-9338

• Sequential appearance of cannabinoids during seedling development in Cannabis sativa L.

• Sex differences in marijuana use in the United States.
  Author(s): McLean Hospital, Belmont, MA 02478, USA.
Federal Resources on Nutrition

In addition to the IBIDS, the United States Department of Health and Human Services (HHS) and the United States Department of Agriculture (USDA) provide many sources of information on general nutrition and health. Recommended resources include:


- The United States Department of Agriculture’s Web site dedicated to nutrition information: [www.nutrition.gov](http://www.nutrition.gov)

- The Food and Drug Administration’s Web site for federal food safety information: [www.foodsafety.gov](http://www.foodsafety.gov)


- The Center for Food Safety and Applied Nutrition has an Internet site sponsored by the Food and Drug Administration and the Department of Health and Human Services: [http://vm.cfsan.fda.gov/](http://vm.cfsan.fda.gov/)


Additional Web Resources

A number of additional Web sites offer encyclopedic information covering food and nutrition. The following is a representative sample:

- AOL: http://search.aol.com/cat.adp?id=174&layer=&from=subcats
- Family Village: http://www.familyvillage.wisc.edu/med_nutrition.html
- Google: http://directory.google.com/Top/Health/Nutrition/
- Healthnotes: http://www.healthnotes.com/
- Yahoo.com: http://dir.yahoo.com/Health/Nutrition/
- WebMD®Health: http://my.webmd.com/nutrition
- WholeHealthMD.com: http://www.wholehealthmd.com/reflib/0,1529,00.html
CHAPTER 3. ALTERNATIVE MEDICINE AND CANNABIS

Overview

In this chapter, we will begin by introducing you to official information sources on complementary and alternative medicine (CAM) relating to cannabis. At the conclusion of this chapter, we will provide additional sources.

The Combined Health Information Database

The Combined Health Information Database (CHID) is a bibliographic database produced by health-related agencies of the U.S. federal government (mostly from the National Institutes of Health) that can offer concise information for a targeted search. The CHID database is updated four times a year at the end of January, April, July, and October. Check the titles, summaries, and availability of CAM-related information by using the “Simple Search” option at the following Web site: http://chid.nih.gov/simple/simple.html. In the drop box at the top, select “Complementary and Alternative Medicine.” Then type “cannabis” (or synonyms) in the second search box. We recommend that you select 100 “documents per page” and to check the “whole records” options. The following was extracted using this technique:

- Marijuana Use in Supportive Care for Cancer Patients
  Contact: Available from National Cancer Institute. Publications Ordering Service, P.O. Box 24128, Baltimore, MD 21227. (800) 4-CANCER or (800) 422-6237; TTY: (800) 332-8615; FAX: (301) 330-7968. PRICE: Free.
  Summary: This fact sheet, developed by the National Cancer Institute (NCI), discusses the use of marijuana for chemotherapy-induced nausea and vomiting, anorexia, and cachexia. It specifies the forms of marijuana that have been used to treat these conditions, and provides examples of other therapies, drugs, or combinations of drugs that can be used in place of marijuana. The fact sheet also briefly reviews the findings of a National Institutes of Health (NIH) meeting convened in February 1997 to explore the potential medical uses of marijuana. 1 reference.
National Center for Complementary and Alternative Medicine

The National Center for Complementary and Alternative Medicine (NCCAM) of the National Institutes of Health (http://nccam.nih.gov/) has created a link to the National Library of Medicine’s databases to facilitate research for articles that specifically relate to cannabis and complementary medicine. To search the database, go to the following Web site: http://www.nlm.nih.gov/nccam/camonpubmed.html. Select “CAM on PubMed.” Enter “cannabis” (or synonyms) into the search box. Click “Go.” The following references provide information on particular aspects of complementary and alternative medicine that are related to cannabis:

- **A case for cannabis.**
  Author(s): Flynn P.

- **A comparison of olanzapine with haloperidol in cannabis-induced psychotic disorder: a double-blind randomized controlled trial.**
  Author(s): Berk M, Brook S, Trandafir AI.

- **A longitudinal study of cannabis use and mental health from adolescence to early adulthood.**
  Author(s): McGee R, Williams S, Poulton R, Moffitt T.

- **A longitudinal study of the effects of tobacco and cannabis exposure on lung function in young adults.**
  Author(s): Taylor DR, Fergusson DM, Milne BJ, Horwood LJ, Moffitt TE, Sears MR, Poulton R.

- **A preliminary controlled study to determine whether whole-plant cannabis extracts can improve intractable neurogenic symptoms.**
  Author(s): Wade DT, Robson P, House H, Makela P, Aram J.

- **A review of the published literature into cannabis withdrawal symptoms in human users.**
  Author(s): Smith NT.
• **Adverse effects of cannabis and cannabinoids.**
  Author(s): Holdcroft A.

• **Adverse effects of cannabis.**
  Author(s): Hall W, Solowij N.

• **Alcohol and cannabis use in schizophrenia: effects of clozapine vs. risperidone.**
  Author(s): Green AI, Burgess ES, Dawson R, Zimmet SV, Strous RD.
  Source: Schizophrenia Research. 2003 March 1; 60(1): 81-5.

• **Alcohol, cannabis and cocaine usage in patients with trauma injuries.**
  Author(s): McDonald A, Duncan ND, Mitchell DI.

• **Allowing the medical use of cannabis.**
  Author(s): Hall WD, Degenhardt LJ, Currow D.

• **Californian centre will test medical uses of cannabis.**
  Author(s): Dalton R.

• **Cannabidiol, a non-psychoactive component of cannabis and its synthetic dimethylheptyl homolog suppress nausea in an experimental model with rats.**
  Author(s): Parker LA, Mechoulam R, Schlievert C.

• **Cannabinoids in pain management. Few well controlled trials of cannabis exist for systemic review.**
  Author(s): Iversen L.
Cannabis and alcohol—a close friendship.
Author(s): Mechoulam R, Parker L.

Cannabis and brain function.
Author(s): Court JM.

Cannabis and cannabidiol: interview with Robert Gorter, M.D. Interview by Fred Gardner.
Author(s): Gorter R.
Source: Aids Treat News. 1998 October 16; (No 305): 4-6 Concl.

Cannabis and cannabinoid receptors.
Author(s): Nocerino E, Amato M, Izzo AA.

Cannabis and cannabinoids: pharmacology and rationale for clinical use.
Author(s): Pertwee RG.

Cannabis and health.
Author(s): Farrell M, Ritson B.

Cannabis and smoking research: interviewing young people in self-selected friendship pairs.
Author(s): Highet G.
• **Cannabis and the brain.**
  Author(s): Iversen L.

• **Cannabis as medicine: time for the phoenix to rise?**
  Author(s): Robson P.

• **Cannabis control. An approach to cannabis use and dependence.**
  Author(s): Frei MY.

• **Cannabis dependence and psychotic symptoms in young people.**
  Author(s): Fergusson DM, Horwood LJ, Swain-Campbell NR.

• **Cannabis dependence, withdrawal, and reinforcing effects among adolescents with conduct symptoms and substance use disorders.**
  Author(s): Crowley TJ, Macdonald MJ, Whitmore EA, Mikulich SK.

• **Cannabis for chronic pain: case series and implications for clinicians.**
  Author(s): Ware MA, Gamsa A, Persson J, Fitzcharles MA.

• **Cannabis for migraine treatment: the once and future prescription? An historical and scientific review.**
  Author(s): Russo E.

• **Cannabis in movement disorders.**
  Author(s): Muller-Vahl KR, Kolbe H, Schneider U, Emrich HM.
• **Cannabis induced dopamine release: an in-vivo SPECT study.**
  Author(s): Voruganti LN, Slomka P, Zabel P, Mattar A, Awad AG.

• **Cannabis ingestion in a chinchilla.**
  Author(s): Pizzi R.
  Source: The Veterinary Record. 2002 January 12; 150(2): 55.

• **Cannabis laws 'threaten validity of trials'.**
  Author(s): Masood E.

• **Cannabis produces dependence: a comment on Smith.**
  Author(s): Martin BR.

• **Cannabis psychosis and acute schizophrenia. a case-control study from India.**
  Author(s): Basu D, Malhotra A, Bhagat A, Varma VK.

• **Cannabis reduces opioid dose in the treatment of chronic non-cancer pain.**
  Author(s): Lynch ME, Clark AJ.

• **Cannabis use and cognitive decline in persons under 65 years of age.**
  Author(s): Lyketsos CG, Garrett E, Liang KY, Anthony JC.
  Source: American Journal of Epidemiology. 1999 May 1; 149(9): 794-800.

• **Cannabis use and public health: assessing the burden.**
  Author(s): Hall W.

• **Cannabis use as described by people with multiple sclerosis.**
  Author(s): Page SA, Verhoeft MJ, Stebbins RA, Metz LM, Levy JC.
• **Cannabis use in the last year in a US national sample of twin and sibling pairs.**
  Author(s): Kendler KS, Neale MC, Thornton LM, Aggen SH, Gilman SE, Kessler RC.

• **Cannabis use is associated with schizotypy and attentional disinhibition.**
  Author(s): Skosnik PD, Spatz-Glenn L, Park S.

• **Cannabis use, abuse, and dependence in a population-based sample of female twins.**
  Author(s): Kendler KS, Prescott CA.

• **Cannabis: a Trojan horse for nicotine?**
  Author(s): Burns CB, Ivers RG, Lindorff KJ, Clough AR.

  Author(s): Kufer J, Dinand E.

• **Cannabis: its therapeutic use.**
  Author(s): Wall J, Davis S, Ridgway S.

• **Cannabis: old medicine with new promise for neurological disorders.**
  Author(s): Carter GT, Weydt P.
- **Cannabis: time for scientific evaluation of this ancient remedy?**  
  Author(s): Sharpe P, Smith G.  

- **Cannabis-induced Koro in Americans.**  
  Author(s): Earleywine M.  

- **Cannabis-induced psychosis: a cross-sectional comparison with acute schizophrenia.**  
  Author(s): Nunez LA, Gurpegui M.  

- **Carbamazepine as an adjunct in the treatment of schizophrenia-like psychosis related to cannabis abuse.**  
  Author(s): Leweke FM, Emrich HM.  

- **Cardiovascular manifestations of substance abuse: part 2: alcohol, amphetamines, heroin, cannabis, and caffeine.**  
  Author(s): Frishman WH, Del Vecchio A, Sanal S, Ismail A.  

- **Changing the focus: the case for recognizing and treating cannabis use disorders.**  
  Author(s): Dennis M, Babor TF, Roebuck MC, Donaldson J.  

- **Characterisation of cannabis plants phenotypes from illegal cultivations in Crete.**  
  Author(s): Tsatsakis AM, Tutudaki M, Stiakakis I, Dimopoulou M, Tzatzarakis M, Michalodimitrakis M.  
  Source: Boll Chim Farm. 2000 May-June; 139(3): 140-5.  

- **Chemotaxonomic features associated with flavonoids of cannabinoid-free cannabis (Cannabis sativa subsp. sativa L.) in relation to hops (Humulus lupulus L.).**  
  Author(s): Vanhoenacker G, Van Rompaey P, De Keukeleire D, Sandra P.
• Clinical profile of participants in a brief intervention program for cannabis use disorder.
  Author(s): Copeland J, Swift W, Rees V.

• Cognitive deficits and cognitive normality in recreational cannabis and Ecstasy/MDMA users.
  Author(s): Parrott A.

• Cognitive measures in long-term cannabis users.
  Author(s): Harrison GP Jr, Gruber AJ, Hudson JI, Huestis MA, Yurgelun-Todd D.

• Comment on 'Health aspects of cannabis: revisited' (Hollister).
  Author(s): Mechoulam R, Golan D.

• Comment on 'Health aspects of cannabis: revisited' (Hollister).
  Author(s): Johnson BA.

• Concerning kif, a Cannabis sativa L. preparation smoked in the Rif mountains of northern Morocco.
  Author(s): Merzouki A, Mesa JM.
• **Correlates and 6-month outcomes for co-occurring cannabis use in rural and urban at-risk drinkers.**  
  Author(s): Booth BM, Kirchner JE.  
  Source: Substance Use & Misuse. 2001 May-June; 36(6-7): 717-33.  

• **Delta9-tetrahydrocannabinol content in cannabis plants of greek origin.**  
  Author(s): Stefanidou M, Athanaselis S, Aleviopoulos G, Papoutsis J, Koutselinis A.  

• **DNA fingerprinting of Cannabis sativa using inter-simple sequence repeat (ISSR) amplification.**  
  Author(s): Kojoma M, Iida O, Makino Y, Sekita S, Satake M.  

• **Early-onset cannabis use and cognitive deficits: what is the nature of the association?**  
  Author(s): Pope HG, Gruber AJ, Hudson JJ, Cohane G, Huestis MA, Yurgelun-Todd D.  
  Source: Drug and Alcohol Dependence. 2003 April 1; 69(3): 303-10.  

• **Escalation of drug use in early-onset cannabis users vs co-twin controls.**  
  Author(s): Lynskey MT, Heath AC, Bucholz KK, Slutske WS, Madden PA, Nelson EC, Statham DJ, Martin NG.  

• **Fresh look at potential cannabis therapies.**  
  Author(s): Gross M.  

• **From gan-zi-gun-nu to anandamide and 2-arachidonoylglycerol: the ongoing story of cannabis.**  
  Author(s): Mechoulam R, Ben-Shabat S.  
  Source: Natural Product Reports. 1999 April; 16(2): 131-43. Review.  

• **Frontal lobe dysfunction in long-term cannabis users.**  
  Author(s): Lundqvist T, Jonsson S, Warkentin S.
• Getting the cannabis withdrawal question into proper perspective: comments on Smith.
  Author(s): Hall W.

• Hemp (Cannabis sativa L.) and abortion.
  Author(s): Merzouki A, Ed-derfoufi F, Molero Mesa J.

• Identifying factors that predict persistent driving after drinking, unsafe driving after drinking, and driving after using cannabis among young adults.
  Author(s): Begg DJ, Langley JD, Stephenson S.

• Improving the debate on cannabis. Let's find out whether cannabis has therapeutic value.
  Author(s): Notcutt W.

• Improving the quality of the cannabis debate: defining the different domains.
  Author(s): Strang J, Witton J, Hall W.

• Is the grass greener? The link between cannabis and psychosis.
  Author(s): McKay DR, Tennant CC.

• Lateral gene transfer of foreign DNA: the missing link between cannabis psychosis and schizophrenia.
  Author(s): Fritzsche M.
• **Lethal ischemic stroke after cisplatin-based chemotherapy for testicular carcinoma and cannabis inhalation.**
  Author(s): Russmann S, Winkler A, Lovblad KO, Stanga Z, Bassetti C.

• **Looking back at Cannabis research.**
  Author(s): Mechoulam R.

• **Marijuana, inflammation, and CT-3 (DMH-11C): cannabis leads to new class of antiinflammatory drugs.**
  Author(s): James JS.

• **Medical marijuana: Federal, State attacks against California cannabis clubs.**
  Author(s): Gardner F, James JS.

• **Medical marijuana: the cannabis controversy.**
  Author(s): Sloane MM.

• **Medicinal use of cannabis: history and current status.**
  Author(s): Kalant H.

• **Ministers urged to back cannabis in pain control.**
  Author(s): Martell R.
- Modulation of the effects of alcohol on driving-related psychomotor skills by chronic exposure to cannabis.
  Author(s): Wright A, Terry P.

- More work needed on cannabis.
  Author(s): Jones JS.

- Multiple sclerosis. The long wait for legal cannabis.
  Author(s): Turner T.

- Neuroendocrine abnormalities in recreational ecstasy (MDMA) users: is it ecstasy or cannabis?
  Author(s): Gouzoulis-Mayfrank E, Becker S, Pelz S, Tuchtenhagen F, Daumann J.
  Source: Biological Psychiatry. 2002 May 1; 51(9): 766-9.

- Neuropsychological performance in long-term cannabis users.
  Author(s): Pope HG Jr, Gruber AJ, Hudson JI, Huestis MA, Yurgelun-Todd D.

- Non-acute (residual) neurocognitive effects of cannabis use: a meta-analytic study.
  Author(s): Grant I, Gonzalez R, Carey CL, Natarajan L, Wolfson T.

- Pharmacological actions and therapeutic uses of cannabis and cannabinoids.
  Author(s): Kumar RN, Chambers WA, Pertwee RG.

- Pharmacology and effects of cannabis: a brief review.
  Author(s): Ashton CH.
Cannabis

Possession of cannabis legal for now.
Author(s): Betteridge G.

Progressive arteritis associated with cannabis use.
Author(s): Schneider HJ, Jha S, Burnand KG.

Providing medical marijuana: the importance of cannabis clubs.
Author(s): Feldman HW, Mandel J.

Psychiatric effects of cannabis.
Author(s): Johns A.

Psychological profile of abstinent recreational Ecstasy (MDMA) users and significance of concomitant cannabis use.
Author(s): Daumann J, Pelz S, Becker S, Tuchtenhagen F, Gouzoulis-Mayfrank E.

Psychotic disorders among inpatients with abuse of cannabis, amphetamine and opiates. Do dopaminergic stimulants facilitate psychiatric illness?
Author(s): Dalmau A, Bergman B, Brismar B.

Reducing the harms caused by cannabis use: the policy debate in Australia.
Author(s): Hall W.
- **Regulator rebuked over cannabis.**  
  Author(s): Abbott A.  

- **Residual neuropsychologic effects of cannabis.**  
  Author(s): Pope HG Jr, Gruber AJ, Yurgelun-Todd D.  

- **Respiratory health effects of cannabis: position statement of the Thoracic Society of Australia and New Zealand.**  
  Author(s): Taylor DR, Hall W; Thoracic Society of Australia and New Zealand.  

- **Screening for cannabis use disorders in an adolescent emergency department sample.**  
  Author(s): Chung T, Colby SM, O’Leary TA, Barnett NP, Monti PM.  
  Source: Drug and Alcohol Dependence. 2003 May 21; 70(2): 177-86.  

- **Small part of cannabis puzzle solved by animal studies.**  
  Author(s): Bradbury J.  

- **Specific attentional dysfunction in adults following early start of cannabis use.**  
  Author(s): Ehrenreich H, Rinn T, Kunert HJ, Moeller MR, Poser W, Schilling L, Gigerenzer G, Hoehe MR.  
  Source: Psychopharmacology. 1999 March; 142(3): 295-301.  

- **Sporting activity and drug use: Alcohol, cigarette and cannabis use among elite student athletes.**  
  Author(s): Peretti-Watel P, Guagliardo V, Verger P, Pruvost J, Mignon P, Obadia Y.  
• **Tailoring cannabis dependence treatment for a diverse population.**
  Author(s): Steinberg KL, Roffman RA, Carroll KM, Kabela E, Kadden R, Miller M, Duresky D; Marijuana Treatment Project Research Group.

• **The cannabis policy debate: finding a way forward.**
  Author(s): Hall W.

• **The cannabis remedy—wonder worker or evil weed?**
  Author(s): Morris K.

• **The Cannabis Youth Treatment (CYT) experiment: rationale, study design and analysis plans.**

• **The legalization of Cannabis for medical use.**
  Author(s): Moffat AC.

• **The need to decriminalise cannabis.**
  Author(s): Vose C.

• **The respiratory effects of cannabis dependence in young adults.**
  Author(s): Taylor DR, Poulton R, Moffitt TE, Ramankutty P, Sears MR.

• **The South African Community Epidemiology Network on Drug Use (SACENDU) project, phases 1-8—cannabis and Mandrax.**
  Author(s): Bhana A, Parry CD, Myers B, Pluddemann A, Morojele NK, Flisher AJ.
• **The therapeutic potential of cannabis in multiple sclerosis.**
  Author(s): Baker D, Pryce G.

• **The therapeutic potential of cannabis.**
  Author(s): Baker D, Pryce G, Giovannoni G, Thompson AJ.

• **The use of cannabis as a mood stabilizer in bipolar disorder: anecdotal evidence and the need for clinical research.**
  Author(s): Grinspoon L, Bakalar JB.

• **Therapeutic aspects of cannabis and cannabinoids.**
  Author(s): Robson P.

• **Therapeutic cannabis.**
  Author(s): Mathre ML.

• **Therapeutic use of cannabis by crack addicts in Brazil.**
  Author(s): Labigalini E Jr, Rodrigues LR, Da Silveira DX.

• **Transient ischemic attack in heavy cannabis smokers--how 'safe' is it?**
  Author(s): Mouzak A, Agathos P, Kerezoudi E, Mantas A, Vourdeli-Yiannakoura E.
- **Uvulitis and partial upper airway obstruction following cannabis inhalation.**  
  Author(s): Boyce SH, Quigley MA.  

- **Who is using cannabis as a medicine and why: an exploratory study.**  
  Author(s): Ogborne AC, Smart RG, Weber T, Birchmore-Timney C.  

**Additional Web Resources**

A number of additional Web sites offer encyclopedic information covering CAM and related topics. The following is a representative sample:

- AOL: [http://search.aol.com/cat.adp?id=169&layer=&from=subcats](http://search.aol.com/cat.adp?id=169&layer=&from=subcats)
- Family Village: [http://www.familyvillage.wisc.edu/med_altn.htm](http://www.familyvillage.wisc.edu/med_altn.htm)
- WebMD®Health: [http://my.webmd.com/drugs_and_herbs](http://my.webmd.com/drugs_and_herbs)
- WholeHealthMD.com: [http://www.wholehealthmd.com/reflib/0,1529„00.html](http://www.wholehealthmd.com/reflib/0,1529„00.html)

The following is a specific Web list relating to cannabis; please note that any particular subject below may indicate either a therapeutic use, or a contraindication (potential danger), and does not reflect an official recommendation (some Web sites are subscription based):

- **General Overview**
  
  Male Infertility  
  Source: Healthnotes, Inc. [www.healthnotes.com](http://www.healthnotes.com)
• **Chinese Medicine**

**Huomaren**
Alternative names: Hemp Seed; Semen Cannabis
Source: Chinese Materia Medica

**Maren Runchang Wan**
Alternative names: Maren Runchang Pills
Source: Pharmacopoeia Commission of the Ministry of Health, People's Republic of China

**Mujingyou**
Alternative names: Negundo Chastetree Oil; Oleum Vitis Negundo
Source: Chinese Materia Medica

**General References**

A good place to find general background information on CAM is the National Library of Medicine. It has prepared within the MEDLINEplus system an information topic page dedicated to complementary and alternative medicine. To access this page, go to the MEDLINEplus site at [http://www.nlm.nih.gov/medlineplus/alternativemedicine.html](http://www.nlm.nih.gov/medlineplus/alternativemedicine.html). This Web site provides a general overview of various topics and can lead to a number of general sources.
CHAPTER 4. DISSERTATIONS ON CANNABIS

Overview

In this chapter, we will give you a bibliography on recent dissertations relating to cannabis. We will also provide you with information on how to use the Internet to stay current on dissertations. IMPORTANT NOTE: When following the search strategy described below, you may discover non-medical dissertations that use the generic term “cannabis” (or a synonym) in their titles. To accurately reflect the results that you might find while conducting research on cannabis, we have not necessarily excluded non-medical dissertations in this bibliography.

Dissertations on Cannabis

ProQuest Digital Dissertations, the largest archive of academic dissertations available, is located at the following Web address: http://wwwlib.umi.com/dissertations. From this archive, we have compiled the following list covering dissertations devoted to cannabis. You will see that the information provided includes the dissertation’s title, its author, and the institution with which the author is associated. The following covers recent dissertations found when using this search procedure:

- **Cannabis Effects Related to Cutaneous Sensory Perception and Personality Measures** by Libman, Eva; Phd from Mcgill University (canada), 1976
  http://wwwlib.umi.com/dissertations/fullcit/NK31826

- **Cannabis Myths and Folklore** by Aldrich, Michael Ray, Phd from State University of New York at Buffalo, 1970, 168 pages
  http://wwwlib.umi.com/dissertations/fullcit/7107140

- **Chronic Cannabis Use among Working-class Men in San Jose, Costa Rica.** by True, William Ray, Jr., Phd from University of Florida, 1976, 192 pages
  http://wwwlib.umi.com/dissertations/fullcit/7706909

- **Chronic Heavy Use of Cannabis Sativa: Psychological Effects** by Bowman, Marilyn Laura; Phd from Mcgill University (canada), 1972
  http://wwwlib.umi.com/dissertations/fullcit/NK11763

- **Comorbidity between Substance Use and Mental Health in Australia: Relationships of Alcohol, Tobacco and Cannabis Use with Other Substance Use and Mental**
Disorders by Degenhardt, Louisa Jane; Phd from University of New South Wales (australia), 2002
http://wwwlib.umi.com/dissertations/fullcit/f580881

Exchange Relationships in a Community on the North Coast of Colombia with Special Reference to Cannabis. by Partridge, William L., Phd from University of Florida, 1974, 294 pages
http://wwwlib.umi.com/dissertations/fullcit/7503519

Harm Reduction, Human Rights, and Canada's Cannabis Controversy by Hathaway, Andrew David; Phd from Mcmaster University (canada), 2000, 211 pages
http://wwwlib.umi.com/dissertations/fullcit/NQ66270

Modeling Cannabis Cultivation in North Georgia (national Forests, Gis, Expert Systems) by Fung, Devlin Sheong-siew, Phd from University of Georgia, 1993, 253 pages
http://wwwlib.umi.com/dissertations/fullcit/9404651

Regulating Cannabis: an Ethnographic Analysis of the Sale and Use of Cannabis in New York City and Rotterdam by Sifaneck, Stephen John, Phd from City University of New York, 1996, 194 pages
http://wwwlib.umi.com/dissertations/fullcit/9707153

Residual Effects of Chronic Cannabis Administration on Behavior in the Rat by Stiglick, Alexander; Phd from University of Toronto (canada), 1983
http://wwwlib.umi.com/dissertations/fullcit/NK59728

Self-administration of Cannabis by Rats by Corcoran, Michael E; Phd from Mcgill University (canada), 1972
http://wwwlib.umi.com/dissertations/fullcit/NK11785

Some Effects of Cannabis and Alcohol Intoxication on Moral Judgements by Poizner, Sonja; Phd from York University (canada), 1973
http://wwwlib.umi.com/dissertations/fullcit/NK15703

The Behavioral Toxicity of Cannabis in the Rat by Fehr, Kevin O'brien; Phd from University of Toronto (canada), 1978
http://wwwlib.umi.com/dissertations/fullcit/NK36645

The Social-psychological Context of Cannabis Use in Denmark: a Study of Compatibility and Contrast in Attitudes and Beliefs. by Nidorf, Jean F., Phd from The University of North Carolina at Chapel Hill, 1973, 260 pages
http://wwwlib.umi.com/dissertations/fullcit/7405953

The Sociology of Reefer Madness: the Criminalization of Marijuana in the United States of America by Elsner, Michael Charles, Phd from The American University, 1994, 239 pages
http://wwwlib.umi.com/dissertations/fullcit/9529083

Understanding Adolescent Cannabis Use: a Stress Process Model Application by Butters, Jennifer Ellen; Phd from University of Toronto (canada), 2001, 296 pages
http://wwwlib.umi.com/dissertations/fullcit/NQ59074

Voluntary Reduction of Cannabis Use among Graduate Students: Reasons and Pattern. by Raffoul, Paul Ralph, Phd from Washington University, 1977, 263 pages
http://wwwlib.umi.com/dissertations/fullcit/7721030
Keeping Current

Ask the medical librarian at your library if it has full and unlimited access to the ProQuest Digital Dissertations database. From the library, you should be able to do more complete searches via http://wwwlib.umi.com/dissertations.
CHAPTER 5. CLINICAL TRIALS AND CANNABIS

Overview

In this chapter, we will show you how to keep informed of the latest clinical trials concerning cannabis.

Recent Trials on Cannabis

The following is a list of recent trials dedicated to cannabis. Further information on a trial is available at the Web site indicated.

- **Cancer Pain**
  Condition(s): Prostatic Neoplasms; Breast Neoplasms; Neoplasm Metastasis
  Study Status: This study is currently recruiting patients.
  Sponsor(s): Center for Medicinal Cannabis Research; University of California, San Francisco
  Purpose - Excerpt: To find out if it is safe and effective to use smoked marijuana in combination with MS Contin to treat cancer pain. The study will evaluate whether smoked marijuana, when used with MS Contin, will have an effect on pain relief, and to see if marijuana reduces the side effects of MS Contin, which include nausea and/or vomiting.
  Phase(s): Phase II
  Study Type: Interventional
  Contact(s): see Web site below
  Web Site: http://clinicaltrials.gov/ct/show/NCT00046709

- **Clozapine and Risperidone for Treatment of First Episode Schizophrenia and Cannabis Use Disorder**
  Condition(s): Schizophrenia; Marijuana Abuse
  Study Status: This study is currently recruiting patients.

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8 These are listed at [www.ClinicalTrials.gov](http://www.ClinicalTrials.gov).
Sponsor(s): National Institute of Mental Health (NIMH)
Purpose - Excerpt: The purpose of this study is to compare the safety, effectiveness, and tolerability of clozapine and risperidone in patients with first episode schizophrenia and cannabis use disorder.
Phase(s): Phase II; Phase III
Study Type: Interventional
Contact(s): see Web site below
Web Site: http://clinicaltrials.gov/ct/show/NCT00063349

- **Morphine Plus Marijuana in Treating Pain Caused by Bone Metastases in Patients With Breast or Prostate Cancer**
  Condition(s): recurrent prostate cancer; stage IV prostate cancer; recurrent breast cancer; stage IV breast cancer; Pain
  Study Status: This study is currently recruiting patients.
  Sponsor(s): University of California, San Francisco; National Cancer Institute (NCI)
  Purpose - Excerpt: RATIONALE: Morphine helps to relieve the pain associated with bone metastases. marijuana may be effective in controlling pain and nausea and vomiting. Combining morphine with marijuana may provide more pain relief and may help to reduce or prevent nausea and vomiting in patients treated with opioids. PURPOSE: Clinical trial to study the effectiveness of combining morphine with marijuana in treating pain caused by bone metastases in patients who have breast or prostate cancer.
  Study Type: Interventional
  Contact(s): see Web site below
  Web Site: http://clinicaltrials.gov/ct/show/NCT00052871

- **SUBSTANCE DEPENDENT TEENS--IMPACT OF TREATING DEPRESSION Study**
  Condition(s): Alcohol-Related Disorders; Marijuana Abuse; Substance-Related Disorders
  Study Status: This study is currently recruiting patients.
  Sponsor(s): National Institute on Drug Abuse (NIDA)
  Purpose - Excerpt: Substance Dependent Teens, Impact of Treating Depression
  Phase(s): Phase IV
  Study Type: Interventional
  Contact(s): see Web site below
  Web Site: http://clinicaltrials.gov/ct/show/NCT00061113
Keeping Current on Clinical Trials

The U.S. National Institutes of Health, through the National Library of Medicine, has developed ClinicalTrials.gov to provide current information about clinical research across the broadest number of diseases and conditions.

The site was launched in February 2000 and currently contains approximately 5,700 clinical studies in over 59,000 locations worldwide, with most studies being conducted in the United States. ClinicalTrials.gov receives about 2 million hits per month and hosts approximately 5,400 visitors daily. To access this database, simply go to the Web site at http://www.clinicaltrials.gov/ and search by “cannabis” (or synonyms).

While ClinicalTrials.gov is the most comprehensive listing of NIH-supported clinical trials available, not all trials are in the database. The database is updated regularly, so clinical trials are continually being added. The following is a list of specialty databases affiliated with the National Institutes of Health that offer additional information on trials:

- For clinical studies at the Warren Grant Magnuson Clinical Center located in Bethesda, Maryland, visit their Web site: http://clinicalstudies.info.nih.gov/
- For clinical studies conducted at the Bayview Campus in Baltimore, Maryland, visit their Web site: http://www.jhbmc.jhu.edu/studies/index.html
- For cancer trials, visit the National Cancer Institute: http://cancertrials.nci.nih.gov/
- For eye-related trials, visit and search the Web page of the National Eye Institute: http://www.nei.nih.gov/neitrials/index.htm
- For heart, lung and blood trials, visit the Web page of the National Heart, Lung and Blood Institute: http://www.nhlbi.nih.gov/studies/index.htm
- For trials on aging, visit and search the Web site of the National Institute on Aging: http://www.grc.nia.nih.gov/studies/index.htm
- For rare diseases, visit and search the Web site sponsored by the Office of Rare Diseases: http://ord.aspensys.com/asp/resources/rsch_trials.asp
- For alcoholism, visit the National Institute on Alcohol Abuse and Alcoholism: http://www.niaaa.nih.gov/intramural/Web_dicbr_hp/particip.htm
- For trials on infectious, immune, and allergic diseases, visit the site of the National Institute of Allergy and Infectious Diseases: http://www.niaid.nih.gov/clintrials/
- For trials on arthritis, musculoskeletal and skin diseases, visit newly revised site of the National Institute of Arthritis and Musculoskeletal and Skin Diseases of the National Institutes of Health: http://www.niams.nih.gov/hi/studies/index.htm
- For hearing-related trials, visit the National Institute on Deafness and Other Communication Disorders: http://www.nidcd.nih.gov/health/clinical/index.htm
- For trials on diseases of the digestive system and kidneys, and diabetes, visit the National Institute of Diabetes and Digestive and Kidney Diseases: http://www.niddk.nih.gov/patient/patient.htm
- For drug abuse trials, visit and search the Web site sponsored by the National Institute on Drug Abuse: http://www.nida.nih.gov/CTN/Index.htm
• For trials on mental disorders, visit and search the Web site of the National Institute of Mental Health: http://www.nimh.nih.gov/studies/index.cfm

• For trials on neurological disorders and stroke, visit and search the Web site sponsored by the National Institute of Neurological Disorders and Stroke of the NIH: http://www.ninds.nih.gov/funding/funding_opportunities.htm#Clinical_Trials
CHAPTER 6. PATENTS ON CANNABIS

Overview

Patents can be physical innovations (e.g. chemicals, pharmaceuticals, medical equipment) or processes (e.g. treatments or diagnostic procedures). The United States Patent and Trademark Office defines a patent as a grant of a property right to the inventor, issued by the Patent and Trademark Office. Patents, therefore, are intellectual property. For the United States, the term of a new patent is 20 years from the date when the patent application was filed. If the inventor wishes to receive economic benefits, it is likely that the invention will become commercially available within 20 years of the initial filing. It is important to understand, therefore, that an inventor’s patent does not indicate that a product or service is or will be commercially available. The patent implies only that the inventor has “the right to exclude others from making, using, offering for sale, or selling” the invention in the United States. While this relates to U.S. patents, similar rules govern foreign patents.

In this chapter, we show you how to locate information on patents and their inventors. If you find a patent that is particularly interesting to you, contact the inventor or the assignee for further information. IMPORTANT NOTE: When following the search strategy described below, you may discover non-medical patents that use the generic term “cannabis” (or a synonym) in their titles. To accurately reflect the results that you might find while conducting research on cannabis, we have not necessarily excluded non-medical patents in this bibliography.

Patents on Cannabis

By performing a patent search focusing on cannabis, you can obtain information such as the title of the invention, the names of the inventor(s), the assignee(s) or the company that owns or controls the patent, a short abstract that summarizes the patent, and a few excerpts from the description of the patent. The abstract of a patent tends to be more technical in nature, while the description is often written for the public. Full patent descriptions contain much more information than is presented here (e.g. claims, references, figures, diagrams, etc.). We

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will tell you how to obtain this information later in the chapter. The following is an example of the type of information that you can expect to obtain from a patent search on cannabis:

- **Adenosine A.sub.1 receptor antisense oligonucleotide treatment of alcohol and marijuana-induced psychomotor impairments**

Inventor(s): Dar; M. Saeed (115 Heritage St., Greenville, NC 27858), Mustafa; S. Jamal (419 Kempton Dr., Greenville, NC 27834)

Assignee(s): none reported

Patent Number: 5,932,557

Date filed: August 12, 1997

Abstract: Preclinical studies in mice and rats based on three microinfusions (12 hours apart) of specifically designed and synthesized adenosine A.sub.1 receptor antisense oligonucleotide with the sequence: (A.sub.1 Antisense: 5'-GGCCGAGATGGAGGGCGGCAT-3' (SEQ ID NO: 1)) and as a control, a mismatched antisense nucleotide with a sequence: (A.sub.1 Sense: 5'-ATGCCGCCCTCCATCTCGGCC-3' (SEQ ID NO: 1)) established that the "functional knock out" of A.sub.1 receptors protected the animals from the well known motor incoordination due to alcohol or .DELTA..sup.9 -tetrahydrocannabinol (THC: the major psychoactive component of marijuana intake). The motor coordination in animals was evaluated by the mouse/rat rotorod treadmill. The antisense was microinfused in mouse cerebellum and in the rat motor cortex whereas ethanol was always administered systemically. However, unlike ethanol, the .DELTA..sup.9 -THC was microinfused into the mouse cerebellum following the cerebellar pretreatment with the antisense. In addition to protection of alcohol or the .DELTA..sup.9 -THC-induced motor incoordination the above antisense molecule should block all functions expressed via adenosine A.sub.1 receptor, such as hypnosis and general CNS intoxication, thereby, further expanding the clinical applications of this oligonucleotide. This antisense may also be useful in treating asthma and anginal chest pains.

Excerpt(s): The present invention relates generally to compositions including and methods utilizing antisense oligonucleotides, and more particularly to the use of an adenosine A.sub.1 receptor antisense oligonucleotide in the prevention/treatment of alcohol and/or marijuana induced psycho-motor impairments. ... Alcohol and marijuana (Cannabis sativa) are among the oldest and most widely used drugs in the world. The major psychoactive ingredient of the marijuana plant is delta.sup.9 -tetrahydrocannabinol (.DELTA..sup.9 -THC) (Razdan, 1986). One of the characteristic pharmacological effects produced by alcohol and .DELTA..sup.9 -THC is motor impairment (MI), such as ataxia and a decrease in spontaneous motor activity (Hollister, 1986; Dewey, 1986). The impairment of motor functions by cannabinoid is well correlated with the presence of high density cannabinoid binding sites in the cerebellum and the basal ganglia (Herkanham et al., 1990; Mailleux and Vanderhaeghen, 1992). It has been suggested that the cannabinoid-induced motor impairments are due to cerebellar mediation (Herkanham et al., 1990). ... Motor impairment in humans is one of the well known adverse consequences of alcohol drinking and marijuana smoking. Thus, marijuana and alcohol appear to produce, in a dose-related manner, a detrimental effect on the ability to drive an automobile. The consequences of use of both psychoactive drugs can be adverse not only for the drinker and smoker, respectively, but also for the safety of passengers in the drinker and smoker's automobile as well as for other non-smoking and non-drinking drivers. A striking deterioration of aircraft handling by pilots was demonstrated even 24 hours after smoking marijuana. Complex
processes, including perception, attention, and information processing, which are involved in driving and flying, are impaired by doses equivalent to one or two cigarettes; the MI lasts for 4 to 8 hours, far beyond the time that the user perceives the subjective effects of the drug. A significant percent of marijuana users failed roadside sobriety test even 90 minutes after its smoking (Hollister, 1986). It is also well known that a high percentage of accident victims have ethanol in their blood. Furthermore, marijuana and alcohol are commonly used together. Ataxia and MI are the most conspicuous physical manifestation of alcohol consumption in animals and humans (Wallgren and Barry, 1970; Ritche, 1980). The MI produced by alcohol is additive to that induced by marijuana, resulting in rapid deterioration of driving performance (Dimijian, 1978; Reeve et al., 1985). These findings bear serious implications for driving, flying, operating rail/ship or performance of other complex tasks, even as long as a day after smoking marijuana and/or drinking alcohol. \( \Delta^9 \text{THC} \) and other cannabinoids produce variety of pharmacological effects which appear to be mediated by the recently characterized cannabinoid receptors (Herkanham et al., 1990) in both humans and laboratory animals. Some of these pharmacological properties are unique to \( \Delta^9 \text{THC} \) and psychoactive cannabinoids such as static ataxia in dogs and discriminative stimulus properties. The cannabinoids also possess many other properties such as analgesic, antiemetic, anticonvulsant and hypothermic which are shared by other drug groups. The recent identification and cloning of a specific cannabinoid receptor suggests that cannabinoids mimic endogenous compounds affecting neural signals for mood, memory, movement and pain. Cannabinoids have been reported to inhibit N-type calcium channels in neuroblastoma-glioma cells involving pertussis toxin-sensitive GTP-binding protein between cannabinoid receptors and calcium channels (Mackie and Hille, 1992). Some of the psychoactive effects of cannabinoids could be due to a calcium channel inhibition-induced decrease in excitability and neurotransmitter release (Mackie and Hille, 1992).


- **Cannabinoid patch and method for cannabis transdermal delivery**

Inventor(s): Yum; Su IL (1021 Runnymead Ct., Los Altos, CA 94024), Brooke; Lawrence L. (3691 Frei Rd., Sebastopol, CA 95472), Herrmann; Cal C. (5621 Sierra Ave., Richmond, CA 94805)

Assignee(s): none reported

Patent Number: 6,328,992

Date filed: September 5, 2000

Abstract: A transdermal structure is provided for delivering cannabis chemical(s) to one's bloodstream. The structure comprises a backing layer which carries the cannabis chemical(s). The chemicals are contained in a film on the backing layer or within a cavity formed in the backing layer. Alternatively, an opening in a secondary layer that overlies the backing layer may be used to create the cavity. The structure is applied to one's skin so that the cannabis chemicals are in contact with the skin. A polymer material which is mixed with the cannabis and placed in the cavity or a membrane over the cavity may be used to control the flow of cannabis chemical(s) into the bloodstream. In an alternative embodiment, a porous material impregnated with cannabis chemical(s) may be used to hold the chemical(s) in the cavity. Because of the relatively slow transdermal flow rate of cannabis materials, it is preferred to utilize permeation enhancers in conjunction with the cannabis carrier or reservoir matrixes or skin contacting adhesive layers.
Cannabis

Excerpt(s): This invention pertains to methods and products for the transdermal administration of cannabis. More particularly, this invention concerns a system for delivering effective dosages of cannabis to one's bloodstream. ... Methods and products for transdermally administering particular chemicals are known in the art. Several U.S. patents have issued for the transdermal application of chemicals, most recently for nicotine. This invention expands the concept of transdermal delivery to cannabis, since the unique social and chemical characteristics of cannabis lend it to such an application. ... Several medicinal uses have been found for the active ingredients of cannabis, including the ingredients tetrahydrocannabinol (THC), cannabinoil (CBN), cannabidiol (CBD) and cannabichromene (CBC). The medicinal uses of cannabis include (1) treatment of nausea and pain associated with cancer and chemotherapy; (2) nausea, pain and wasting associated with AIDS; (3) arthritis and rheumatism; (4) glaucoma; (5) migraines; (6) muscle spasticity associated with multiple sclerosis and paralysis; (7) alcohol and narcotics withdrawal; (8) stress and depression; (9) asthma; and (10) epileptic seizures. Despite the many proven or suspected benefits of cannabis, legal and social barriers prevent its widespread use. Currently, only Marinol, a synthetic form of THC is available by prescription to patients. One purpose of the present invention is to extend the widespread medicinal use of cannabis without triggering the legal or social barriers associated with prescription of the drug.


• Marijuana eradication using fluorescein dyes

Inventor(s): Putsche, Jr.; Fred W. (517 La Claire Ave., Linthicum, MD 21090)
Assignee(s): none reported
Patent Number: 5,252,541
Date filed: January 15, 1992
Abstract: A method of eradicating unwanted vegetation, such as the marijuana plant, the method including the steps of preparing a predetermined concentration of fluorescein or like dye, the dye including a photodynamic pigment which in the presence of oxygen acts as a sensitizer for photo-oxidation in the vegetation, and applying a charge of the concentration of dye to soil in the vicinity of the roots of the vegetation, thereby leading to the absorption of the charge by the roots of the vegetation such that the dye will react with proteins, fatty acids, and lipids at cellular membranes of the vegetation causing membrane lipid peroxidation, and as a result of the reaction, causing the destruction of cells and tissues therein and the subsequent death of the vegetation.

Excerpt(s): This invention relates to a non-toxic method of eradicating vegetation through the application of a fluorescein or like dye to the vegetation, thereby resulting in an effective, cost efficient, quick acting, and safe means of disposing of unwanted or hazardous vegetation. ... Unwanted vegetation includes vegetation that the weekend gardener characterizes as weeds; vegetation that exhibits uncontrollable growth, such as the fast growing vine kudzu which takes over telephone poles, power lines, plants, trees and anything else in its path; and unlawful vegetation, such as the marijuana, coca and poppy plants. For all of these types of vegetation, it would be highly desirous to have a cost efficient, quick acting, easy to apply, and non-toxic method of eradication. ... The eradication of the marijuana plants by law enforcement officials is of particular importance and difficulty, thereby requiring a new effective eradication means. A currently and extensively used method of eradication involves manual removal of the
vegetation, and has many disadvantages. This type of eradication is expensive, time consuming, and dangerous, as it requires the marijuana plants be cut down and either hauled away to often distant loading trucks outside inaccessible fields, or burned on the spot. These activities carry with them the dangers of swinging machetes, heat exhaustion and confrontations with poisonous snakes, or the need to use large quantities of flammable fuel, to burn the green marijuana plants, which can lead to brush fires and pollution. Additionally, cultivation of marijuana plants by growers is a profitable business, and many growers arm themselves heavily in order to protect their crops, using snipers and booby traps in an effort to intimidate federal employees and public land users.


- **Marijuana scented incense and method of making**
  Inventor(s): Martin; Kenneth E. (30 Hollywood Dr., Florence, KY 41042)
  Assignee(s): none reported
  Patent Number: 4,158,549
  Date filed: March 31, 1978
  Abstract: An incense produces, when burned, a marijuana-like scent although it does not contain a marijuana component. The incense comprises about 10 parts by weight ground alfalfa stems and leaves; about 1 part by weight ground bayleaves; and about 1.5 parts by weight powdered non-aromatic waxy maize corn starch binder. These components are mixed, about 6 parts by weight of water is added, and the total mix is then extruded, molded, coated onto bamboo sticks, cut, or otherwise formed. The formed mix is dried of substantially all moisture, and can thereafter be burned to produce a marijuana-like scent.
  Excerpt(s): This invention relates to incense and more particularly to incense having a distinctive burning scent similar to that of marijuana. ... At the present time and in many if not all states, the possession of marijuana is illegal, yet many are believed to enjoy its distinctive scent and desire to be able to reproduce that scent without violating any current law. Of course, the scent is available simply by burning the real marijuana, however, as stated, this cannot be accomplished without the risk of arrest, and its consequences. ... While several claimed marijuana scent producers have appeared on the market, none of those known accurately reproduce the particular aromatic characteristics of burning marijuana. Accordingly, it has been one objective of the present invention to provide an incense which, when burned, produces a scent or odor like that of burning marijuana.

- **Method and apparatus for processing herbaceous plant materials including the plant cannabis**
  Inventor(s): McKinney; Laurence O. (881 Massachusetts Ave., Cambridge, MA 02139)
  Assignee(s): none reported
  Patent Number: 4,279,824
  Date filed: November 1, 1979
Abstract: Herbaceous plant material is processed by heating it to within a specific temperature range for a predetermined period of time, within a novel processing apparatus. The plant material is held in an atmosphere whose oxygen content is controlled to convert a chemical found in the material into a more useful form without significant degradation taking place during the conversion process. In the instance wherein the herbaceous material is the plant substance cannabis, the material is heated in an inert atmosphere in accordance with the inventive method to carry out a step of decarboxylation which changes cannabinolic acid present in cannabis into the psychoactive drug or chemical delta-9 Tetrahydrocannabinol. Control of decarboxylation in accordance with the invention prevents destructive pyrolysis and degradative oxidation of the delta-9 tetrahydrocannabinol. Oxidative degradation is further prevented by storing the processed material in an inert atmosphere, while controlled degradation may be achieved by selective oxidative heating.

Excerpt(s): The instant invention is concerned with the field of herbaceous plant materials from which there may be realized in one form or another medicinal compounds such as drugs and other pharmaceuticals. ... At the present time, the herbaceous plant material cannabis is grown, processed, and utilized in the United States under Government regulations and controlled by Government agencies. Research and study is carried out under the control of Federal Agencies, and work is being carried out in the medical field by medical laboratories and others relative to the use of the drug as a therapeutic pharmaceutical, and relative to its use also as a social euphoriant. ... It is understood that difficulties are often encountered by those engaged in government research and medical studies dealing with cannabis. The government has for some time provided researchers with plant material both in loose form and in pre-rolled cigarettes. Despite careful controls on the varieties grown under government supervision to provide this experimental material, the amount of delta-9 tetrahydrocannabinol can still vary widely from sample to sample. The only current methods in use that provide a means to decarboxylate the cannabinolic acid in the plant to the active delta-9 tetrahydrocannabinol are destructive both to the plant material, and to whatever delta-9 tetrahydrocannabinol is actually created.


- **Method of identifying country of origin of cannabis**

  Inventor(s): Brenneisen; Rudolf M. (Berne, CH), ElSohly; Mahmoud A. (Oxford, MS)
  Assignee(s): University of Mississippi (University, MS)
  Patent Number: 5,252,490
  Date filed: October 31, 1989

  Abstract: The method of identification of the country of origin of CANNABIS (Marijuana). The method comprises gas chromatographic/mass spectrometric analysis of extracts of multiple samples of marijuana plant material from a country or geographical location, preparing a location profile from the chemical profiles made from analysis of the multiple samples from a specific country or location. The analyzed profile of a sample of unknown origin is compared with the location profiles of the various countries growing marijuana.

  Excerpt(s): The present invention is directed to a method useful in the identification of the country of origin of CANNABIS (Marijuana), particularly in the determination of the country of origin of marijuana confiscated by seizure of marijuana illegally smuggled...
into the country. The method involves development of a location profile of samples of marijuana grown in various countries of the world from chemical profiles of such samples. ... Herbal Cannabis (Cannabis, marijuana), Cannabis resin (hashish), and extracts of Cannabis resin (hashish oil) are still the most abused illicit drugs of the world. It is estimated that over 8,000 tons of Cannabis are being consumed in the United States each year. The majority of this material is smuggled into the country from major Cannabis-producing countries such as Colombia, Mexico, Jamaica, and Thailand. More recently an increase of the domestic production has been observed. ... In an effort to combat drug abuse, the current U.S. Administration policy has been multifaceted. One of the major efforts to reduce availability of the drug is through enforcement and interdiction. To have a successful interdiction program, it is important to know where the illicit drug is coming from so that resources can be allocated where most needed to stop shipments. There are reasons to believe that Cannabis from one country is being shipped to the United States through intermediate countries, for example, Colombian or Thai Cannabis through Mexico to the United States. Consequently, a seizure of Cannabis at the Mexican border does not necessarily mean that it originated in Mexico. A procedure to determine the country of origin of a Cannabis sample is thus of great importance in law enforcement and forensic science applications.


- **Stable diazonium salt generator for improved marijuana analysis**

  Inventor(s): Reiss; Andre (147-47 Village Rd., Jamaica, NY 11435)
  
  Assignee(s): none reported
  
  Patent Number: 4,288,344
  
  Date filed: July 9, 1979
  
  Abstract: A stable, two liquid reagent set for detecting Marijuana is described. The two liquids contain a coupling reagent for Marijuana Phenols and a second color developing reagent. Marijuana plant Phenols successively treated with one drop each of these solutions will produce a characteristic red dye. The compositions remain stable over six months.
  
  Excerpt(s): The present invention relates to a diazotizing Composition of Matter to provide a newly stable reagent for Marijuana detection. ... Historically, Diazonium Salts have proven valuable as analytical reagents and dyestuff components. However, their instability in liquid form has proven a serious liability. With a life span of only days before decomposing, pre-packaged solutions of Diazonium Salts have not been commercialized. Alternative mixtures of the dry Salts with an inert material, to be dissolved just before use, have been found too cumbersome. ... Therefore, dry Salt mixtures of Fast Blue BB Salt, an excellent reagent for the detection of Marijuana, have not been widely used in pre-packaged test kits. More stable though less reliable methods have had to be substituted.

• **Transcutaneous application of marijuana**
  
  Inventor(s): Cristobal; Walter (P.O. Box 372, Bernalillo, NM 87004)  
  
  Assignee(s): none reported  
  
  Patent Number: 6,132,762  
  
  Date filed: May 5, 1998  
  
  Abstract: A transcutaneous therapeutic formulation comprising marijuana and a carrier for the treatment of pain, inflammation, arthritis and related disorders in humans and animals.  
  
  Excerpt(s): The present invention relates to the transcutaneous treatment of pain, inflammation and arthritic conditions using marijuana. ... Marijuana contains many compounds, the major psychoactive compound being \( \text{\Delta}^1 \)-Tetrahydrocannabinol (THC), also known as \( \text{\Delta}^9 \)-THC depending on the carbon numbering convention used (Mechoulam, R., Science, 168: 1159-1166, 1970). THC and other compounds in marijuana have been reported to have activities in addition to psychoactivity. Researchers have reported beneficial activities that cause analgesic, antiemetic, and antiglaucoma effects. However, researchers have not identified all of the compounds and functional groups responsible for these pharmacological effects. ... The social stigma and unwanted side-effects associated with recreational marijuana use motivated the search for antipsychotic THC derivatives and analogs. Since the mid-1970s, scientists have examined various forms of THC, particularly \( \text{\Delta}^1 \)-THC metabolites that lack psychoactive properties. For example, researchers have focused recently on dimethylheptyl-THC-11 oic acid (DMH-11C) and its use as a nonpsychoactive antiinflammatory agent (Zurier, R. B., Rosesetti, R. G., Lane, J. H., Goldberg, J. M., Hunter, S. A., Burnstein, S. H., Arthritis & Rheumatism, 41:163-170, 1998). When administered orally in a safflower oil carrier, this agent demonstrated antiinflammatory properties in adjuvant-induced polyarthritic rats. The dose level for marked analgesic and antiinflammatory effects was on the order of one microgram of DMH-11C to one kg of body weight. Researchers working on DMH-11C purport a plan for developing parenteral formulations as well (Developing the Next Generation of Analgesic and Antiinflammatory Drugs, http://www.atlan.com/anlgesc2.htm, Apr. 23, 1998). However, no one has yet to utilize topical administration of marijuana solutions, THC or agents with a cannabinoid-like structure for the treatment of inflammation or arthritis.  
  

**Patent Applications on Cannabis**

As of December 2000, U.S. patent applications are open to public viewing. Applications are patent requests which have yet to be granted. (The process to achieve a patent can take several years.) The following patent applications have been filed since December 2000 relating to cannabis:

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10 This has been a common practice outside the United States prior to December 2000.
• Process and apparatus for pollinating a cannabis crop in a building

Inventor(s): Clark, Jody Don ; (Kelowna, CA)

Correspondence: ANTONY C. EDWARDS; SUITE 800; 1708 DOLPHIN AVENUE; KELOWNA; BC; V1Y 9S4; CA

Patent Application Number: 20030159348

Date filed: February 27, 2003

Abstract: A process for pollinating a crop of female cannabis plant contained in a building having internal ventilation ducting, wherein the process includes the steps of locating an intake for the internal ventilation ducting, providing a dispensable dispersant which includes male cannabis pollen or spores, and administering the dispersant into the intake so as to cause the dispersant to flow downstream into the ducting.

Excerpt(s): This application claims priority from U.S. Provisional Patent Application No. 60/360,014 filed Feb. 28, 2003 entitled Method and Apparatus for Pollinating a Cannabis Crop in a Building. ... This invention relates to a process and apparatus for controlling the cultivation of controlled substances such as cannabis plants within a building, and in particular to a process and apparatus for pollinating a crop of female cannabis plants so as to induce the female plants to go to seed. ... To the best of applicant's information, in the year 2000 the police in or about Surrey, British Columbia, Canada conducted search and seizure operations on approximately three hundred fifty illegal marijuana growing operations, and in the first six months of the same year police in or about the cities of Penticton, Kelowna and Vernon, British Columbia Canada conducted search and seizure operations involving seven hundred seventy two illegal marijuana growing operations. Again, to the best of applicant's information, in the first six months of 2001 police in the Penticton, Kelowna and Vernon area located one thousand seventy two illegal marijuana growing operations and estimate that they are only locating between ten and fifteen percent of the actual total number of local illegal marijuana growing operations.


• Process for extraction of Delta-9-Tetrahydrocannabinol and other related cannabinoids and preparation of specific strength marijuana cigarettes

Inventor(s): Murty, Ram B. ; (Lexington, KY), Chowdhury, Dipak K. ; (Lexington, KY), Mangena, Murty ; (Lexington, KY)

Correspondence: LAW OFFICES OF TOWNSEND & BANTA; Suite 500, #50028; 1225 Eye Street, N.W.; Washington; DC; 20005; US

Patent Application Number: 20030050334

Date filed: April 30, 2002

Abstract: A process for supercritical fluid extraction of delta-9-tetrahydrocannabinol (delta-9-THC), delta-8-THC, cannabinoids or other medicinal value compounds from marijuana and other plants. Preferably, the extraction is carried out with a solvent of liquid carbon dioxide alone, or in combination with a solvent of ethanol, methanol, isopropanol, and other nonpolar/semipolar solvents at a temperature and pressure to maintain the solvents in a supercritical state. The extraction process is preferably carried out for a period of from 0 to 9 hours. The extraction process conditions result in different strengths of extracted marijuana and selective isolation of extracted compounds or
mixtures of compounds. The processed marijuana leaves or other parts of the marijuana plant can be used in the manufacture of different strengths of cigarettes for the delivery of delta-9-THC or other related compounds, or as adjuvant drugs for antiinflammatory and analgesic treatment, especially for chronic and terminal pain, neuropathic pain symptoms in humans, and in animals. Further, spiking methods can be used to make cigarettes of different strengths containing delta-9-THC or other related compounds, either synthetic or natural. Placebo cigarettes can also be prepared with pharmacologically negligible quantities of an active compound. The isolated compounds, or mixture of isolated compounds and adjuvants, of the extracted compounds can be used for the treatment of the above mentioned symptoms, either through cigarettes or by other suitable delivery systems.

Excerpt(s): The present invention relates in general to the isolation/extraction from plant materials of pharmacologically active ingredients therein, and more particularly, to the extraction from marijuana plant parts of Delta-9-Tetrahydrocannabinol (THC) and other related compounds using one or more supercritical fluids. The present invention also provides a method of preparation of cigarettes (a drug delivery device) having differing specific concentrations of ingredients from the extracted marijuana leaves and other parts with the aid of spiking with either synthetic or natural compounds or mixture of compounds. In addition, placebo cigarettes can be prepared using the present method, having negligible quantities of Delta-9-THC therein. The isolated active compound or mixture of compounds can be used in different delivery devices for the treatment of pain. ... Marijuana plants have been used since antiquity for herbal medicine and intoxication. Marijuana has been reported as having more than 30 different medical uses such as treating pain, nausea and vomiting associated with chemotherapy, wasting syndrome and appetite stimulation for AIDS patients, glaucoma, and neurological symptoms including muscle spasticity. ... During the past twenty years there has been a steady increase in the illicit use of opiates. Among the opiates, Cannabis sativa (marijuana) or parts thereof, the major pharmacologically active component of which is .DELTA..sup.9-tetrahydrocannabinol (.DELTA..sup.9-THC), continues to be the most frequently abused drug, especially among young adults and school children. As a result, concerns regarding the pathophysiology of marijuana on the human organ system have been investigated.


Keeping Current

In order to stay informed about patents and patent applications dealing with cannabis, you can access the U.S. Patent Office archive via the Internet at the following Web address: http://www.uspto.gov/main/patents.htm. Under “Services,” click on “Search Patents.” You will see two broad options: (1) Patent Grants, and (2) Patent Applications. To see a list of granted patents, perform the following steps: Under “Patent Grants,” click “Quick Search.” Then, type “cannabis” (or synonyms) into the “Term 1” box. After clicking on the search button, scroll down to see the various patents which have been granted to date on cannabis. You can also use this procedure to view pending patent applications concerning cannabis. Simply go back to the following Web address: http://www.uspto.gov/main/patents.htm. Under “Services,” click on “Search Patents.” Select “Quick Search” under “Patent Applications.” Then proceed with the steps listed above.
CHAPTER 7. BOOKS ON CANNABIS

Overview

This chapter provides bibliographic book references relating to cannabis. In addition to online booksellers such as www.amazon.com and www.bn.com, excellent sources for book titles on cannabis include the Combined Health Information Database and the National Library of Medicine. Your local medical library also may have these titles available for loan.

Book Summaries: Online Booksellers

Commercial Internet-based booksellers, such as Amazon.com and Barnes&Noble.com, offer summaries which have been supplied by each title’s publisher. Some summaries also include customer reviews. Your local bookseller may have access to in-house and commercial databases that index all published books (e.g. Books in Print). IMPORTANT NOTE: Online booksellers typically produce search results for medical and non-medical books. When searching for “cannabis” at online booksellers’ Web sites, you may discover non-medical books that use the generic term “cannabis” (or a synonym) in their titles. The following is indicative of the results you might find when searching for “cannabis” (sorted alphabetically by title; follow the hyperlink to view more details at Amazon.com):

- Alcohol, Tobacco and Cannabis Use Among Ontario Adults in 1997 and Changes Since 1977: Epidemiological Findings from the Ontario Drug Monitor (Research
- **Cannabis & Cognitive Functioning** by Nadia Solowij (Author); ISBN: 0521591147; http://www.amazon.com/exec/obidos/ASIN/0521591147/icongroupinterna
- **Cannabis** : a review of some important national inquiries and significant research reports; ISBN: 0642906432; http://www.amazon.com/exec/obidos/ASIN/0642906432/icongroupinterna
- **Cannabis and Cannabinoids: Pharmacology, Toxicology, and Therapeutic Potential** by Franjo Grotenhermen (Editor), Ethan Russo (Editor); ISBN: 0789015080; http://www.amazon.com/exec/obidos/ASIN/0789015080/icongroupinterna
- **Cannabis and Culture** by Vera Rubin (Editor) (1975); ISBN: 9027976694; http://www.amazon.com/exec/obidos/ASIN/9027976694/icongroupinterna
- **Cannabis in Medical Practice: A Legal, Historical and Pharmacological Overview of the Therapeutic Use of Marijuana** by Mary Lynn Mathre (Editor) (1997); ISBN: 0786403616; http://www.amazon.com/exec/obidos/ASIN/0786403616/icongroupinterna
- **Cannabis Indications Scientific Aspects** by Martin Martinez (Author); ISBN: 096668401X; http://www.amazon.com/exec/obidos/ASIN/096668401X/icongroupinterna
- **Cannabis Physiopathology Epidemiology Detection** by Gabriel G. Nahas, Colette Latour (Editor); ISBN: 0849383102; http://www.amazon.com/exec/obidos/ASIN/0849383102/icongroupinterna
- **Cannabis Underground Library: Seven Rare Classics** by Adam Gottlieb (2000); ISBN: 0914171712; http://www.amazon.com/exec/obidos/ASIN/0914171712/icongroupinterna


- **Cannabis: Multiple Sclerosis, This One... Der, Fool Life** by Gary G. Graham (2000); ISBN: 1873189400; http://www.amazon.com/exec/obidos/ASIN/1873189400/icolgroupinterna


- **Learn to Say No: Cannabis (Learn to Say No)** by Angela Royston (2001); ISBN: 0431099057; http://www.amazon.com/exec/obidos/ASIN/0431099057/icongroupinterna


The National Library of Medicine Book Index

The National Library of Medicine at the National Institutes of Health has a massive database of books published on healthcare and biomedicine. Go to the following Internet site, http://locatorplus.gov/, and then select “Search LOCATORplus.” Once you are in the search area, simply type “cannabis” (or synonyms) into the search box, and select “books only.” From there, results can be sorted by publication date, author, or relevance. The following was recently cataloged by the National Library of Medicine:


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11 In addition to LOCATORplus, in collaboration with authors and publishers, the National Center for Biotechnology Information (NCBI) is currently adapting biomedical books for the Web. The books may be accessed in two ways: (1) by searching directly using any search term or phrase (in the same way as the bibliographic database PubMed), or (2) by following the links to PubMed abstracts. Each PubMed abstract has a “Books” button that displays a facsimile of the abstract in which some phrases are hypertext links. These phrases are also found in the books available at NCBI. Click on hyperlinked results in the list of books in which the phrase is found. Currently, the majority of the links are between the books and PubMed. In the future, more links will be created between the books and other types of information, such as gene and protein sequences and macromolecular structures. See http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=Books.


Hallucinogenic drugs; a perspective with special reference to peyote and cannabis. Author: McGlothlin, William H.; Year: 1966; [Santa Monica, Calif., Rand Corporation] 1964


Marijuana and your child. Author: Saltman, Jules.; Year: 1971; New York, Grosset; Dunlap [1970]


The sexual power of marijuana. Author: Lewis, Barbara.; Year: 1970; New York, Wyden [c1970]

Chapters on Cannabis

In order to find chapters that specifically relate to cannabis, an excellent source of abstracts is the Combined Health Information Database. You will need to limit your search to book chapters and cannabis using the “Detailed Search” option. Go to the following hyperlink: http://chid.nih.gov/detail/detail.html. To find book chapters, use the drop boxes at the bottom of the search page where “You may refine your search by.” Select the dates and language you prefer, and the format option “Book Chapter.” Type “cannabis” (or synonyms) into the “For these words:” box. The following is a typical result when searching for book chapters on cannabis:

Chemical Dependence

Contact: Available from Butterworth-Heinemann. 225 Wildwood Avenue, Woburn, MA 01801-2041. (800) 366-2665 or (781) 904-2500. Fax (800) 446-6520 or (781) 933-6333. E-mail: orders@bhusa.com. Website: www.bh.com. PRICE: $110.00. ISBN: 0723610568.

Summary: Chemical dependence (substance or drug abuse) is a growing problem worldwide. Abuse of a drug is defined as self-administration in a manner that deviates from the cultural norm and is harmful. Addiction is defined as the continued use of a specific psychoactive substance despite physical, psychological, or social harm. This chapter on chemical dependence is from a text that covers the general medical and surgical conditions relevant to the oral health care sciences. Topics include aspects of chemical dependence, the consumption of alcohol, fetal alcohol syndrome, alcohol withdrawal, nicotine and tobacco, benzodiazepines, barbiturates, opioids (narcotics), amphetamines, cocaine, psychedelic drugs (cannabis, LSD, PCP, ketamine), anesthetic abuse, and anabolic steroids. For each condition, the authors discuss general aspects, diagnosis and management issues, dental aspects, and patient care strategies. The chapter includes a summary of the points covered. One appendix lists street names and other terms for drugs of abuse. 4 tables. 38 references.

- **Drugs and Other Substance Abuse in Pregnancy**


Contact: ADIS Health Science Press, 404 Sydney Road, Balgowlah, NSW 2093, Australia.

Summary: Drugs and Other Substance Abuse in Pregnancy, a chapter in Drug Use in Pregnancy, presents information gathered from experience and research at the Family Center in Pennsylvania and a review of the literature. The Family Center offers methadone maintenance along with psychosocial, obstetrical, neonatal, and early childhood development services to addicted women. The recent practice of multiple drug use has compounded the effects upon the pregnant woman and her fetus and newborn. Researchers have seen withdrawal symptomatology from an increasing number of psychoactive agents in the newborn. Evaluations have included reports of the behavior of newborn infants born to drug-dependent women. Several researchers have evaluated the long-term outcome of children born to drug-dependent women in cross-sectional and longitudinal studies. The chapter has seven sections, covering different substances: (1) Narcotics (heroin, methadone, and pentazocine), looking at maternal social and obstetrical evaluations, maternal medical complications, fetal and placental effects, neonatal effects, and psychological issues; (2) alcoholism, examining the fetal and neonatal effects and pathophysiology; (3) nicotine, discussing fetal and perinatal effects (birth weight, mortality, and long-term outlook), maternal complications (pregnancy and breast feeding), and pathophysiology (nicotine, carbon monoxide, cyanide, placental effects, and vascular changes); (4) cannabis, covering mutagenic effects, teratogenicity, and behavioral effects; (5) benzodiazepines, noting occurrence, withdrawal, pharmacokinetics, perinatal effects, and teratogenicity; (6) barbiturates, focusing on maternal effects, perinatal effects, and teratogenicity; and (7) amphetamines, noting their neonatal effects and teratogenicity.
CHAPTER 8. MULTIMEDIA ON CANNABIS

Overview

In this chapter, we show you how to keep current on multimedia sources of information on cannabis. We start with sources that have been summarized by federal agencies, and then show you how to find bibliographic information catalogued by the National Library of Medicine.

Bibliography: Multimedia on Cannabis

The National Library of Medicine is a rich source of information on healthcare-related multimedia productions including slides, computer software, and databases. To access the multimedia database, go to the following Web site: http://locatorplus.gov/. Select “Search LOCATORplus.” Once in the search area, simply type in cannabis (or synonyms). Then, in the option box provided below the search box, select “Audiovisuals and Computer Files.” From there, you can choose to sort results by publication date, author, or relevance. The following multimedia has been indexed on cannabis (for more information, follow the hyperlink indicated):

- **[Marijuana] [motion picture]** Source: an Avanti Films production; Year: 1968; Format: Marijuana; United States: Distributed by Bailey Films, [1968]
- **Marijuana [videorecording]** Source: GWC; Year: 1997; Format: Videorecording; Cahokia, IL: GWC, c1997
- **Marijuana [videorecording]: the gateway drug** Source: AIMS Multimedia; Year: 1998; Format: Videorecording; Chatsworth, CA: AIMS Multimedia, 1998
- **Marijuana [videorecording]: the mirror that magnifies** Source: presented by the Haigh Ashbury Free Clinics & CNS Productions, Inc; Year: 1996; Format: Videorecording; Ashland, OR: CNS Production, Inc., c1996
- **Marijuana and hashish [videorecording]** Source: produced by the Office of Telecourses, Continuing Education, University of Washington and the School of Social Work, University of Washington, in cooperation with the Alcoholism and Drug Abuse Institute; Year: 1976; Format: Videorecording; [Seattle]: Roger A. Roffman, 1976
• **Research report: THC: the chemistry of marijuana** [motion picture] Source: Leo E. Hollister; produced by KCET, Los Angeles; Year: 1968; Format: Motion picture; Los Angeles: KCET; [Bloomington, Ind.: for loan and sale by Indiana University, 1968?]

• **Workshop on the Medical Utility of Marijuana** [electronic resource]: report to the director, National Institutes of Health Source: by the Ad Hoc Group of Experts; Year: 1997; Format: Electronic resource; [Bethesda, MD: National Institutes of Health, 1997]
APPENDICES
APPENDIX A. PHYSICIAN RESOURCES

Overview

In this chapter, we focus on databases and Internet-based guidelines and information resources created or written for a professional audience.

NIH Guidelines

Commonly referred to as “clinical” or “professional” guidelines, the National Institutes of Health publish physician guidelines for the most common diseases. Publications are available at the following by relevant Institute12:

- Office of the Director (OD); guidelines consolidated across agencies available at http://www.nih.gov/health/consumer/conkey.htm
- National Institute of General Medical Sciences (NIGMS); fact sheets available at http://www.nigms.nih.gov/news/facts/
- National Cancer Institute (NCI); guidelines available at http://www.cancer.gov/cancerinfo/list.aspx?viewid=5f35036e-5497-4d86-8c2c-714a9f7c8d25
- National Eye Institute (NEI); guidelines available at http://www.nei.nih.gov/order/index.htm
- National Human Genome Research Institute (NHGRI); research available at http://www.genome.gov/page.cfm?pageID=1000375
- National Institute on Aging (NIA); guidelines available at http://www.nia.nih.gov/health/

12 These publications are typically written by one or more of the various NIH Institutes.
- National Institute on Alcohol Abuse and Alcoholism (NIAAA); guidelines available at http://www.niaaa.nih.gov/publications/publications.htm
- National Institute of Allergy and Infectious Diseases (NIAID); guidelines available at http://www.niaid.nih.gov/publications/
- National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS); fact sheets and guidelines available at http://www.niams.nih.gov/hi/index.htm
- National Institute of Child Health and Human Development (NICHD); guidelines available at http://www.nichd.nih.gov/publications/pubskey.cfm
- National Institute on Deafness and Other Communication Disorders (NIDCD); fact sheets and guidelines at http://www.nidcd.nih.gov/health/
- National Institute of Dental and Craniofacial Research (NIDCR); guidelines available at http://www.nidr.nih.gov/health/
- National Institute of Environmental Health Sciences (NIEHS); environmental health information available at http://www.niehs.nih.gov/external/facts.htm
- National Institute of Mental Health (NIMH); guidelines available at http://www.nimh.nih.gov/practitioners/index.cfm
- National Institute of Neurological Disorders and Stroke (NINDS); neurological disorder information pages available at http://www.ninds.nih.gov/health_and_medical/disorder_index.htm
- National Institute of Nursing Research (NINR); publications on selected illnesses at http://www.nih.gov/ninr/news-info/publications.html
- National Institute of Biomedical Imaging and Bioengineering; general information at http://grants.nih.gov/grants/becon/becon_info.htm
- Center for Information Technology (CIT); referrals to other agencies based on keyword searches available at http://kb.nih.gov/www_query_main.asp
- National Center for Complementary and Alternative Medicine (NCCAM); health information available at http://nccam.nih.gov/health/
- National Center for Research Resources (NCRR); various information directories available at http://www.ncrr.nih.gov/publications.asp
- Centers for Disease Control and Prevention; various fact sheets on infectious diseases available at http://www.cdc.gov/publications.htm
NIH Databases

In addition to the various Institutes of Health that publish professional guidelines, the NIH has designed a number of databases for professionals. Physician-oriented resources provide a wide variety of information related to the biomedical and health sciences, both past and present. The format of these resources varies. Searchable databases, bibliographic citations, full-text articles (when available), archival collections, and images are all available. The following are referenced by the National Library of Medicine:

- **Bioethics**: Access to published literature on the ethical, legal, and public policy issues surrounding healthcare and biomedical research. This information is provided in conjunction with the Kennedy Institute of Ethics located at Georgetown University, Washington, D.C.: [http://www.nlm.nih.gov/databases/databases_bioethics.html](http://www.nlm.nih.gov/databases/databases_bioethics.html)


- **Population Information**: The National Library of Medicine provides access to worldwide coverage of population, family planning, and related health issues, including family planning technology and programs, fertility, and population law and policy: [http://www.nlm.nih.gov/databases/databases_population.html](http://www.nlm.nih.gov/databases/databases_population.html)


- **Clinical Alerts**: Reports the release of findings from the NIH-funded clinical trials where such release could significantly affect morbidity and mortality: [http://www.nlm.nih.gov/databases/alerts/clinical_alerts.html](http://www.nlm.nih.gov/databases/alerts/clinical_alerts.html)


- **MEDLINE**: Bibliographic database covering the fields of medicine, nursing, dentistry, veterinary medicine, the healthcare system, and the pre-clinical sciences: [http://www.nlm.nih.gov/databases/databases_medline.html](http://www.nlm.nih.gov/databases/databases_medline.html)

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13 Remember, for the general public, the National Library of Medicine recommends the databases referenced in MEDLINEplus (http://medlineplus.gov/ or http://www.nlm.nih.gov/medlineplus/databases.html).

• **Toxicology and Environmental Health Information (TOXNET):** Databases covering toxicology and environmental health: [http://sis.nlm.nih.gov/Tox/ToxMain.html](http://sis.nlm.nih.gov/Tox/ToxMain.html)


The Combined Health Information Database

A comprehensive source of information on clinical guidelines written for professionals is the Combined Health Information Database. You will need to limit your search to one of the following: Brochure/Pamphlet, Fact Sheet, or Information Package, and “cannabis” using the “Detailed Search” option. Go directly to the following hyperlink: [http://chid.nih.gov/detail/detail.html](http://chid.nih.gov/detail/detail.html). To find associations, use the drop boxes at the bottom of the search page where “You may refine your search by.” For the publication date, select “All Years.” Select your preferred language and the format option “Fact Sheet.” Type “cannabis” (or synonyms) into the “For these words:” box. The following is a sample result:

• **The International Drug Strategy Institute Position Paper on the Medicinal Applications of Marijuana**

  Contact: Cotton - O’Neil Clinic, 901 SW Garfield Avenue, Topeka, KS, 66606-1695, (913) 354-9591.

  Summary: This paper examines the scientific and medical facts surrounding the therapeutic applications of marijuana, the potentially harmful effects of the drug, the alleged unfilled needs of the medical community in the related therapeutic areas, and appropriate solutions. It traces the history of the movement to use marijuana therapeutically, from its 1972 rescheduling from an illegal drug to a drug with potential for abuse but able to be prescribed, to the 1994 court decision setting forth new guidelines that only rigorous scientific proof can satisfy the requirements of “currently accepted medical use”. The article focuses on the harmful and addictive properties of the drug as a major issue for the chronic use necessary for conditions such as AIDS wasting syndrome or glaucoma. It enumerates the negative side effects of marijuana, indicates the availability of alternative drugs, and outlines the social consequences of rescheduling marijuana. The conclusion suggests that properly designed studies should be funded if therapeutic applications are identified by reputable medical groups, but condemns the "drug culture's" efforts to legalize and legitimize drug use.

• **Marijuana**


  Contact: Available from Substance and Alcohol Intervention Services for the Deaf (SAISD), Rochester Institute of Technology (RIT), Hale-Andrews Student Life Center, 115 Lomb Memorial Drive, Rochester, NY 14623-5608. Voice/TTY (716) 475-4978; Fax (716) 475-7375; E-mail: SPCGRL@RIT.Edu. PRICE: Single copy free.

  Summary: This brochure provides basic information for deaf people about marijuana use. The brochure describes marijuana and the process of marijuana addiction, which goes from experimentation through situational misuse, habitual abuse, and addiction. The brochure also lists the physical effects of marijuana on the body, how to know if a marijuana problem exists, and the facts of marijuana risks compared to tobacco use.
risks. The brochure includes a section listing places and organizations where readers can get help, including hospitals, employee assistance programs, doctors, clergy and family counselors, the National Council on Alcoholism and Drug Dependency (NCADD), and Substance and Alcohol Intervention Services for the Deaf (SAISD). The front cover of the brochure is illustrated with the sign for marijuana.

The NLM Gateway

The NLM (National Library of Medicine) Gateway is a Web-based system that lets users search simultaneously in multiple retrieval systems at the U.S. National Library of Medicine (NLM). It allows users of NLM services to initiate searches from one Web interface, providing one-stop searching for many of NLM’s information resources or databases. To use the NLM Gateway, simply go to the search site at http://gateway.nlm.nih.gov/gw/Cmd. Type “cannabis” (or synonyms) into the search box and click “Search.” The results will be presented in a tabular form, indicating the number of references in each database category.

Results Summary

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</tr>
</tbody>
</table>

HSTAT

HSTAT is a free, Web-based resource that provides access to full-text documents used in healthcare decision-making. These documents include clinical practice guidelines, quick-reference guides for clinicians, consumer health brochures, evidence reports and technology assessments from the Agency for Healthcare Research and Quality (AHRQ), as well as AHRQ's Put Prevention Into Practice. Simply search by “cannabis” (or synonyms) at the following Web site: http://text.nlm.nih.gov.

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16 The NLM Gateway is currently being developed by the Lister Hill National Center for Biomedical Communications (LHNCBC) at the National Library of Medicine (NLM) of the National Institutes of Health (NIH).
19 Other important documents in HSTAT include: the National Institutes of Health (NIH) Consensus Conference Reports and Technology Assessment Reports; the HIV/AIDS Treatment Information Service (ATIS) resource documents; the Substance Abuse and Mental Health Services Administration's Center for Substance Abuse Treatment (SAMHSA/CSAT) Treatment Improvement Protocols (TIP) and Center for Substance Abuse Prevention (SAMHSA/CSAP) Prevention Enhancement Protocols System (PEPS); the Public Health Service (PHS) Preventive Services Task Force's Guide to Clinical Preventive Services; the independent, nonfederal Task Force on Community Services' Guide to Community Preventive Services; and the Health Technology Advisory Committee (HTAC) of the Minnesota Health Care Commission (MHCC) health technology evaluations.
Coffee Break: Tutorials for Biologists\textsuperscript{20}

Coffee Break is a general healthcare site that takes a scientific view of the news and covers recent breakthroughs in biology that may one day assist physicians in developing treatments. Here you will find a collection of short reports on recent biological discoveries. Each report incorporates interactive tutorials that demonstrate how bioinformatics tools are used as a part of the research process. Currently, all Coffee Breaks are written by NCBI staff\textsuperscript{21}. Each report is about 400 words and is usually based on a discovery reported in one or more articles from recently published, peer-reviewed literature\textsuperscript{22}. This site has new articles every few weeks, so it can be considered an online magazine of sorts. It is intended for general background information. You can access the Coffee Break Web site at the following hyperlink: \url{http://www.ncbi.nlm.nih.gov/Coffeebreak/}.

Other Commercial Databases

In addition to resources maintained by official agencies, other databases exist that are commercial ventures addressing medical professionals. Here are some examples that may interest you:

- **CliniWeb International**: Index and table of contents to selected clinical information on the Internet; see \url{http://www.ohsu.edu/cliniweb/}.

- **Medical World Search**: Searches full text from thousands of selected medical sites on the Internet; see \url{http://www.mwsearch.com/}.

\textsuperscript{20} Adapted from \url{http://www.ncbi.nlm.nih.gov/Coffeebreak/Archive/FAQ.html}.

\textsuperscript{21} The figure that accompanies each article is frequently supplied by an expert external to NCBI, in which case the source of the figure is cited. The result is an interactive tutorial that tells a biological story.

\textsuperscript{22} After a brief introduction that sets the work described into a broader context, the report focuses on how a molecular understanding can provide explanations of observed biology and lead to therapies for diseases. Each vignette is accompanied by a figure and hypertext links that lead to a series of pages that interactively show how NCBI tools and resources are used in the research process.
APPENDIX B. PATIENT RESOURCES

Overview

Official agencies, as well as federally funded institutions supported by national grants, frequently publish a variety of guidelines written with the patient in mind. These are typically called “Fact Sheets” or “Guidelines.” They can take the form of a brochure, information kit, pamphlet, or flyer. Often they are only a few pages in length. Since new guidelines on cannabis can appear at any moment and be published by a number of sources, the best approach to finding guidelines is to systematically scan the Internet-based services that post them.

Patient Guideline Sources

The remainder of this chapter directs you to sources which either publish or can help you find additional guidelines on topics related to cannabis. Due to space limitations, these sources are listed in a concise manner. Do not hesitate to consult the following sources by either using the Internet hyperlink provided, or, in cases where the contact information is provided, contacting the publisher or author directly.

The National Institutes of Health

The NIH gateway to patients is located at http://health.nih.gov/. From this site, you can search across various sources and institutes, a number of which are summarized below.

Topic Pages: MEDLINEplus

The National Library of Medicine has created a vast and patient-oriented healthcare information portal called MEDLINEplus. Within this Internet-based system are “health topic pages” which list links to available materials relevant to cannabis. To access this system, log on to http://www.nlm.nih.gov/medlineplus/healthtopics.html. From there you can either search using the alphabetical index or browse by broad topic areas. Recently, MEDLINEplus listed the following when searched for “cannabis”:
• Guides on cannabis

Marijuana Abuse

• Other guides

Amphetamine Abuse

Club Drugs

Smoking and Youth

Within the health topic page dedicated to cannabis, the following was listed:

• General/Overviews

Marijuana: Adverse Effects
Source: Mayo Foundation for Medical Education and Research
http://www.mayoclinic.com/invoke.cfm?id=SA00097

Marijuana: The Facts
Source: Drug Enforcement Administration
http://www.usdoj.gov/dea/ongoing/marijuana.html

• Treatment

Principles of Drug Addiction Treatment: A Research-Based Guide
Source: National Institute on Drug Abuse
http://www.nida.nih.gov/PODAT/PODATindex.html

Treatment Methods
Source: National Institute on Drug Abuse

Treatment Referral Sources for Adolescent Marijuana Users
Source: Substance Abuse and Mental Health Services Administration
http://www.samhsa.gov/oas/2k2/YouthMJtx/YouthMJtx.htm

Types of Treatment (Drug Addiction)
Source: Office of National Drug Control Policy
http://www.whitehousedrugpolicy.gov/treat/treatment.html

• Specific Conditions/Aspects

Marijuana: Can It Relieve Pain?
Source: Mayo Foundation for Medical Education and Research
http://www.mayoclinic.com/invoke.cfm?id=MH00015
• **Children**

  **Mind Over Matter - The Brain's Response to Marijuana**
  Source: National Institute on Drug Abuse

• **From the National Institutes of Health**

  **Marijuana**
  Source: National Institute on Drug Abuse

  **Marijuana: Facts Parents Need to Know**
  Source: National Institute on Drug Abuse
  http://www.nida.nih.gov/MarijBroch/MarijparentsN.html

• **Latest News**

  **Marijuana Use Does Not Accelerate HIV Infection**
  Source: 08/18/2003, Reuters Health

• **Organizations**

  **American Council for Drug Education**
  http://www.acde.org/

  **Drug Enforcement Administration**
  http://www.usdoj.gov/dea/

  **National Clearinghouse for Alcohol and Drug Information**
  Source: Dept. of Health and Human Services, Substance Abuse and Mental Health Services Administration
  http://www.health.org/

  **National Institute on Drug Abuse**
  http://www.nida.nih.gov/NIDAHome.html

  **Partnership for a Drug-Free America**

• **Prevention/Screening**

  **Ten Good Reasons to Focus on Marijuana Use**
  Source: National Clearinghouse for Alcohol and Drug Information

• **Research**

  **Cognitive Deficits Associated With Heavy Marijuana Use Appear To Be Reversible**
  Source: National Institute on Drug Abuse
Did “Sixties’ Parents” Marijuana Use Hurt Their Kids?
Source: Substance Abuse and Mental Health Services Administration

Evidence Accumulates That Long-Term Marijuana Users Experience Withdrawal
Source: National Institute on Drug Abuse

Potential Medication Can Reduce Effects of Smoked Marijuana in Humans
Source: National Institute on Drug Abuse

Researchers Link Smoking Marijuana with Risk of Head and Neck Cancers
Source: American Cancer Society
http://www.cancer.org/docroot/NWS/content/NWS_1_1x_Smoking_Marijuana_May_Increase_Cancer_Risk.asp

Study Demonstrates That Marijuana Smokers Experience Significant Withdrawal
Source: National Institute on Drug Abuse

Study Sheds Light on Progression to Drug Dependence
Source: National Institute on Drug Abuse

• Statistics

2002 Monitoring the Future Survey Shows Decrease in Use of Marijuana, Club Drugs, Cigarettes and Tobacco
Source: National Institute on Drug Abuse

High School and Youth Trends
Source: National Institute on Drug Abuse

Marijuana Use Among Youths
Source: Substance Abuse and Mental Health Services Administration
http://www.samhsa.gov/oas/2k2/YouthMJuse/YouthMJuse.htm

Marijuana Use and Drug Dependence
Source: Substance Abuse and Mental Health Services Administration

Teen Drug Use Declined in 2002, Report Shows
Source: National Institute on Drug Abuse

Youth Marijuana Admissions by Race and Ethnicity
Source: Substance Abuse and Mental Health Services Administration

• Teenagers

How Does Marijuana Affect Your Teen’s Mental Health?
Source: National Clearinghouse for Alcohol and Drug Information
Marijuana: Facts for Teens
Source: National Institute on Drug Abuse
http://www.nida.nih.gov/MarijBroch/Marijteens.html

Tips for Teens: The Truth About Marijuana
Source: National Clearinghouse for Alcohol and Drug Information
http://www.health.org/govpubs/PHD641/

You may also choose to use the search utility provided by MEDLINEplus at the following Web address: http://www.nlm.nih.gov/medlineplus/. Simply type a keyword into the search box and click “Search.” This utility is similar to the NIH search utility, with the exception that it only includes materials that are linked within the MEDLINEplus system (mostly patient-oriented information). It also has the disadvantage of generating unstructured results. We recommend, therefore, that you use this method only if you have a very targeted search.

The Combined Health Information Database (CHID)

CHID Online is a reference tool that maintains a database directory of thousands of journal articles and patient education guidelines on cannabis. CHID offers summaries that describe the guidelines available, including contact information and pricing. CHID’s general Web site is http://chid.nih.gov/. To search this database, go to http://chid.nih.gov/detail/detail.html. In particular, you can use the advanced search options to look up pamphlets, reports, brochures, and information kits. The following was recently posted in this archive:

- Marijuana Reality Check Community Kit

  Contact: National Clearinghouse for Alcohol and Drug Information, Substance Abuse and Mental Health Service Administration, PO Box 2345, Rockville, MD, 20852-2345, (301) 468-2600, http://www.health.org.

  Summary: This community kit is for the Reality Check Campaign, a nationwide effort to prevent and reduce the problems associated with marijuana use among youth, specifically among 9- to 14-year-olds. Since people who know their communities are best able to address substance abuse issues, the campaign has been designed for delivery at the local level. The campaign objectives are: to reduce the proportion of young people who report past month use of marijuana to 3.2 percent (current past month use is 8.2 percent); to increase perception of harm and risk associated with marijuana use to 90 percent (current rate is 60.8 percent); and to increase the level of disapproval for consistent marijuana use to 90 percent (current level is 81.9 percent). The kit contains strategies on how to conduct a local public information campaign and how to use the media to get the message out including developing press lists, talking points, and backgrounderd. Sample press releases and camera-ready artwork are also included.

Healthfinder™

Healthfinder™ is sponsored by the U.S. Department of Health and Human Services and offers links to hundreds of other sites that contain healthcare information. This Web site is
located at http://www.healthfinder.gov. Again, keyword searches can be used to find guidelines. The following was recently found in this database:

- **Marijuana Facts and Figures**
  
  Summary: Marijuana is a green, brown, or gray mixture of dried, shredded leaves, stems, seeds, and flowers of the hemp plant (Cannabis sativa).
  
  Source: Office of National Drug Control Policy, The White House
  
  http://www.healthfinder.gov/scripts/recordpass.asp?RecordType=0&RecordID=7198

### The NIH Search Utility

The NIH search utility allows you to search for documents on over 100 selected Web sites that comprise the NIH-WEB-SPACE. Each of these servers is “crawled” and indexed on an ongoing basis. Your search will produce a list of various documents, all of which will relate in some way to cannabis. The drawbacks of this approach are that the information is not organized by theme and that the references are often a mix of information for professionals and patients. Nevertheless, a large number of the listed Web sites provide useful background information. We can only recommend this route, therefore, for relatively rare or specific disorders, or when using highly targeted searches. To use the NIH search utility, visit the following Web page: http://search.nih.gov/index.html.

### Additional Web Sources

A number of Web sites are available to the public that often link to government sites. These can also point you in the direction of essential information. The following is a representative sample:

- AOL: http://search.aol.com/cat.adp?id=168&layer=&from=subcats
- Family Village: http://www.familyvillage.wisc.edu/specific.htm
- Google: http://directory.google.com/Top/Health/Conditions_and_Diseases/
- Yahoo.com: http://dir.yahoo.com/Health/Diseases_and_Conditions/
- WebMD®Health: http://my.webmd.com/health_topics

### Finding Associations

There are several Internet directories that provide lists of medical associations with information on or resources relating to cannabis. By consulting all of associations listed in this chapter, you will have nearly exhausted all sources for patient associations concerned with cannabis.
The National Health Information Center (NHIC)

The National Health Information Center (NHIC) offers a free referral service to help people find organizations that provide information about cannabis. For more information, see the NHIC’s Web site at http://www.health.gov/NHIC/ or contact an information specialist by calling 1-800-336-4797.

Directory of Health Organizations

The Directory of Health Organizations, provided by the National Library of Medicine Specialized Information Services, is a comprehensive source of information on associations. The Directory of Health Organizations database can be accessed via the Internet at http://www.sis.nlm.nih.gov/Dir/DirMain.html. It is composed of two parts: DIRLINE and Health Hotlines.

The DIRLINE database comprises some 10,000 records of organizations, research centers, and government institutes and associations that primarily focus on health and biomedicine. To access DIRLINE directly, go to the following Web site: http://dirline.nlm.nih.gov/. Simply type in “cannabis” (or a synonym), and you will receive information on all relevant organizations listed in the database.

Health Hotlines directs you to toll-free numbers to over 300 organizations. You can access this database directly at http://www.sis.nlm.nih.gov/hotlines/. On this page, you are given the option to search by keyword or by browsing the subject list. When you have received your search results, click on the name of the organization for its description and contact information.

The Combined Health Information Database

Another comprehensive source of information on healthcare associations is the Combined Health Information Database. Using the “Detailed Search” option, you will need to limit your search to “Organizations” and “cannabis”. Type the following hyperlink into your Web browser: http://chid.nih.gov/detail/detail.html. To find associations, use the drop boxes at the bottom of the search page where “You may refine your search by.” For publication date, select “All Years.” Then, select your preferred language and the format option “Organization Resource Sheet.” Type “cannabis” (or synonyms) into the “For these words:” box. You should check back periodically with this database since it is updated every three months.

The National Organization for Rare Disorders, Inc.

The National Organization for Rare Disorders, Inc. has prepared a Web site that provides, at no charge, lists of associations organized by health topic. You can access this database at the following Web site: http://www.rarediseases.org/search/orgsearch.html. Type “cannabis” (or a synonym) into the search box, and click “Submit Query.”
APPENDIX C. FINDING MEDICAL LIBRARIES

Overview

In this Appendix, we show you how to quickly find a medical library in your area.

Preparation

Your local public library and medical libraries have interlibrary loan programs with the National Library of Medicine (NLM), one of the largest medical collections in the world. According to the NLM, most of the literature in the general and historical collections of the National Library of Medicine is available on interlibrary loan to any library. If you would like to access NLM medical literature, then visit a library in your area that can request the publications for you.23

Finding a Local Medical Library

The quickest method to locate medical libraries is to use the Internet-based directory published by the National Network of Libraries of Medicine (NN/LM). This network includes 4626 members and affiliates that provide many services to librarians, health professionals, and the public. To find a library in your area, simply visit http://nnlm.gov/members/adv.html or call 1-800-338-7657.

Medical Libraries in the U.S. and Canada

In addition to the NN/LM, the National Library of Medicine (NLM) lists a number of libraries with reference facilities that are open to the public. The following is the NLM’s list and includes hyperlinks to each library’s Web site. These Web pages can provide information on hours of operation and other restrictions. The list below is a small sample of

23 Adapted from the NLM: http://www.nlm.nih.gov/psd/cas/interlibrary.html.
libraries recommended by the National Library of Medicine (sorted alphabetically by name of the U.S. state or Canadian province where the library is located):24

- **Alabama**: Health InfoNet of Jefferson County (Jefferson County Library Cooperative, Lister Hill Library of the Health Sciences), [http://www.uab.edu/infonet/](http://www.uab.edu/infonet/)
- **Alabama**: Richard M. Scrushy Library (American Sports Medicine Institute)
- **Arizona**: Samaritan Regional Medical Center: The Learning Center (Samaritan Health System, Phoenix, Arizona), [http://www.samaritan.edu/library/bannerlibs.htm](http://www.samaritan.edu/library/bannerlibs.htm)
- **California**: Kris Kelly Health Information Center (St. Joseph Health System, Humboldt), [http://www.humboldt1.com/~kkhic/index.html](http://www.humboldt1.com/~kkhic/index.html)
- **California**: Community Health Library of Los Gatos, [http://www.healthlib.org/orgresources.html](http://www.healthlib.org/orgresources.html)
- **California**: Consumer Health Program and Services (CHIPS) (County of Los Angeles Public Library, Los Angeles County Harbor-UCLA Medical Center Library) - Carson, CA, [http://www.colapublib.org/services/chips.html](http://www.colapublib.org/services/chips.html)
- **California**: Gateway Health Library (Sutter Gould Medical Foundation)
- **California**: Health Library (Stanford University Medical Center), [http://www-med.stanford.edu/healthlibrary/](http://www-med.stanford.edu/healthlibrary/)
- **California**: Patient Education Resource Center - Health Information and Resources (University of California, San Francisco), [http://sfghdean.ucsf.edu/barnett/PERC/default.asp](http://sfghdean.ucsf.edu/barnett/PERC/default.asp)
- **California**: Redwood Health Library (Petaluma Health Care District), [http://www.phcd.org/rdwdlib.html](http://www.phcd.org/rdwdlib.html)
- **California**: Los Gatos PlaneTree Health Library, [http://planetreesanjose.org/](http://planetreesanjose.org/)
- **California**: Sutter Resource Library (Sutter Hospitals Foundation, Sacramento), [http://suttermedicalcenter.org/library/](http://suttermedicalcenter.org/library/)
- **California**: Health Sciences Libraries (University of California, Davis), [http://www.lib.ucdavis.edu/healthsci/](http://www.lib.ucdavis.edu/healthsci/)
- **California**: ValleyCare Health Library & Ryan Comer Cancer Resource Center (ValleyCare Health System, Pleasanton), [http://gaelnet.stmarys-ca.edu/other.libs/gbal/east/vchl.html](http://gaelnet.stmarys-ca.edu/other.libs/gbal/east/vchl.html)
- **California**: Washington Community Health Resource Library (Fremont), [http://www.healthlibrary.org/](http://www.healthlibrary.org/)
- **Connecticut**: Hartford Hospital Health Science Libraries (Hartford Hospital), [http://www.harthosp.org/library/](http://www.harthosp.org/library/)
- **Connecticut**: Healthnet: Connecticut Consumer Health Information Center (University of Connecticut Health Center, Lyman Maynard Stowe Library), [http://library.uchc.edu/departm/hnet/](http://library.uchc.edu/departm/hnet/)

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- **Connecticut**: Waterbury Hospital Health Center Library (Waterbury Hospital, Waterbury), [http://www.waterburyhospital.com/library/consumer.shtml](http://www.waterburyhospital.com/library/consumer.shtml)
- **Delaware**: Consumer Health Library (Christiana Care Health System, Eugene du Pont Preventive Medicine & Rehabilitation Institute, Wilmington), [http://www.christianacare.org/health_guide/health_guide_pmri_health_info.cfm](http://www.christianacare.org/health_guide/health_guide_pmri_health_info.cfm)
- **Delaware**: Lewis B. Flinn Library (Delaware Academy of Medicine, Wilmington), [http://www.delamed.org/chls.html](http://www.delamed.org/chls.html)
- **Georgia**: Family Resource Library (Medical College of Georgia, Augusta), [http://cmc.mcg.edu/kids_families/fam_resources/fam_res_lib/rl.htm](http://cmc.mcg.edu/kids_families/fam_resources/fam_res_lib/rl.htm)
- **Georgia**: Health Resource Center (Medical Center of Central Georgia, Macon), [http://www.mccg.org/hrc/hrchome.asp](http://www.mccg.org/hrc/hrchome.asp)
- **Hawaii**: Hawaii Medical Library: Consumer Health Information Service (Hawaii Medical Library, Honolulu), [http://hml.org/CHIS/](http://hml.org/CHIS/)
- **Idaho**: DeArmond Consumer Health Library (Kootenai Medical Center, Coeur d’Alene), [http://www.nicon.org/DeArmond/index.htm](http://www.nicon.org/DeArmond/index.htm)
- **Illinois**: Health Learning Center of Northwestern Memorial Hospital (Chicago), [http://www.nmh.org/health_info/hlc.html](http://www.nmh.org/health_info/hlc.html)
- **Illinois**: Medical Library (OSF Saint Francis Medical Center, Peoria), [http://www.osfsaintfrancis.org/general/library/](http://www.osfsaintfrancis.org/general/library/)
- **Kentucky**: Medical Library - Services for Patients, Families, Students & the Public (Central Baptist Hospital, Lexington), [http://www.centralbap.com/education/community/library.cfm](http://www.centralbap.com/education/community/library.cfm)
- **Kentucky**: University of Kentucky - Health Information Library (Chandler Medical Center, Lexington), [http://www.mc.uky.edu/PatientEd/](http://www.mc.uky.edu/PatientEd/)
- **Louisiana**: Alton Ochsner Medical Foundation Library (Alton Ochsner Medical Foundation, New Orleans), [http://www.ochsner.org/library/](http://www.ochsner.org/library/)
- **Louisiana**: Louisiana State University Health Sciences Center Medical Library-Shreveport, [http://lib-sh.lsuhsnc.edu/](http://lib-sh.lsuhsnc.edu/)
- **Maine**: Franklin Memorial Hospital Medical Library (Franklin Memorial Hospital, Farmington), [http://www.fchn.org/fmh/lib.htm](http://www.fchn.org/fmh/lib.htm)
- **Maine**: Gerrish-True Health Sciences Library (Central Maine Medical Center, Lewiston), [http://www.cmcmc.org/library/library.html](http://www.cmcmc.org/library/library.html)
- **Maine**: Hadley Parrot Health Science Library (Eastern Maine Healthcare, Bangor), [http://www.emh.org/hl/hpl/guide.htm](http://www.emh.org/hl/hpl/guide.htm)
- **Maine**: Maine Medical Center Library (Maine Medical Center, Portland), [http://www.mmc.org/library/](http://www.mmc.org/library/)
- **Maine**: Parkview Hospital (Brunswick), [http://www.parkviewhospital.org/](http://www.parkviewhospital.org/)
- **Maine**: Southern Maine Medical Center Health Sciences Library (Southern Maine Medical Center, Biddeford), [http://www.smmcm.org/services/service.php?choice=10](http://www.smmcm.org/services/service.php?choice=10)
- **Maine**: Stephens Memorial Hospital’s Health Information Library (Western Maine Health, Norway), [http://www.wmhcc.org/Library/](http://www.wmhcc.org/Library/)
• **Manitoba, Canada:** Consumer & Patient Health Information Service (University of Manitoba Libraries),
  http://www.umanitoba.ca/libraries/units/health/reference/chis.html

• **Manitoba, Canada:** J.W. Crane Memorial Library (Deer Lodge Centre, Winnipeg),
  http://www.deerlodge.mb.ca/crane_library/about.asp

• **Maryland:** Health Information Center at the Wheaton Regional Library (Montgomery County, Dept. of Public Libraries, Wheaton Regional Library),
  http://www.mont.lib.md.us/healthinfo/hic.asp

• **Massachusetts:** Baystate Medical Center Library (Baystate Health System),
  http://www.baystatehealth.com/1024/

• **Massachusetts:** Boston University Medical Center Alumni Medical Library (Boston University Medical Center), http://med-libwww.bu.edu/library/lib.html

• **Massachusetts:** Lowell General Hospital Health Sciences Library (Lowell General Hospital, Lowell),
  http://www.lowellgeneral.org/library/HomePageLinks/WWW.htm

• **Massachusetts:** Paul E. Woodard Health Sciences Library (New England Baptist Hospital, Boston),
  http://www.nebh.org/health_lib.asp

• **Massachusetts:** St. Luke’s Hospital Health Sciences Library (St. Luke’s Hospital, Southcoast Health System, New Bedford),
  http://www.southcoast.org/library/

• **Massachusetts:** Treadwell Library Consumer Health Reference Center (Massachusetts General Hospital),
  http://www.mgh.harvard.edu/library/chrcindex.html

• **Massachusetts:** UMass HealthNet (University of Massachusetts Medical School, Worcester),
  http://healthnet.umassmed.edu/

• **Michigan:** Botsford General Hospital Library - Consumer Health (Botsford General Hospital, Library & Internet Services),
  http://www.botsfordlibrary.org/consumer.htm

• **Michigan:** Helen DeRoy Medical Library (Providence Hospital and Medical Centers),
  http://www.providence-hospital.org/library/

• **Michigan:** Marquette General Hospital - Consumer Health Library (Marquette General Hospital, Health Information Center),
  http://www.mgh.org/center.html

• **Michigan:** Patient Education Resouce Center - University of Michigan Cancer Center (University of Michigan Comprehensive Cancer Center, Ann Arbor),
  http://www.cancer.med.umich.edu/learn/leares.htm

• **Michigan:** Sladen Library & Center for Health Information Resources - Consumer Health Information (Detroit),
  http://www.henryford.com/body.cfm?id=39330

• **Montana:** Center for Health Information (St. Patrick Hospital and Health Sciences Center, Missoula)

• **National:** Consumer Health Library Directory (Medical Library Association, Consumer and Patient Health Information Section),
  http://caphis.mlanet.org/directory/index.html

• **National:** National Network of Libraries of Medicine (National Library of Medicine) - provides library services for health professionals in the United States who do not have access to a medical library, http://nnlm.gov/

• **National:** NN/LM List of Libraries Serving the Public (National Network of Libraries of Medicine), http://nnlm.gov/members/
• **Nevada:** Health Science Library, West Charleston Library (Las Vegas-Clark County Library District, Las Vegas), [http://www.lvccld.org/special_collections/medical/index.htm](http://www.lvccld.org/special_collections/medical/index.htm)

• **New Hampshire:** Dartmouth Biomedical Libraries (Dartmouth College Library, Hanover), [http://www.dartmouth.edu/~biomed/resources.html/d/conshealth.html/](http://www.dartmouth.edu/~biomed/resources.html/d/conshealth.html/)

• **New Jersey:** Consumer Health Library (Rahway Hospital, Rahway), [http://www.rahwayhospital.com/library.htm](http://www.rahwayhospital.com/library.htm)

• **New Jersey:** Dr. Walter Phillips Health Sciences Library (Englewood Hospital and Medical Center, Englewood), [http://www.englewoodhospital.com/links/index.htm](http://www.englewoodhospital.com/links/index.htm)

• **New Jersey:** Meland Foundation (Englewood Hospital and Medical Center, Englewood), [http://www.geocities.com/ResearchTriangle/9360/](http://www.geocities.com/ResearchTriangle/9360/)

• **New York:** Choices in Health Information (New York Public Library) - NLM Consumer Pilot Project participant, [http://www.nypl.org/branch/health/links.html](http://www.nypl.org/branch/health/links.html)

• **New York:** Health Information Center (Upstate Medical University, State University of New York, Syracuse), [http://www.upstate.edu/library/hic/](http://www.upstate.edu/library/hic/)

• **New York:** Health Sciences Library (Long Island Jewish Medical Center, New Hyde Park), [http://www.lij.edu/library/library.html](http://www.lij.edu/library/library.html)

• **New York:** ViaHealth Medical Library (Rochester General Hospital), [http://www.nyam.org/library/](http://www.nyam.org/library/)

• **Ohio:** Consumer Health Library (Akron General Medical Center, Medical & Consumer Health Library), [http://www.akrongeneral.org/hwlibrary.htm](http://www.akrongeneral.org/hwlibrary.htm)

• **Oklahoma:** The Health Information Center at Saint Francis Hospital (Saint Francis Health System, Tulsa), [http://www.sfh-tulsa.com/services/healthinfo.asp](http://www.sfh-tulsa.com/services/healthinfo.asp)

• **Oregon:** Planetree Health Resource Center (Mid-Columbia Medical Center, The Dalles), [http://www.mcmc.net/phrc/](http://www.mcmc.net/phrc/)

• **Pennsylvania:** Community Health Information Library (Milton S. Hershey Medical Center, Hershey), [http://www.hmc.psu.edu/commhealth/](http://www.hmc.psu.edu/commhealth/)

• **Pennsylvania:** Community Health Resource Library (Geisinger Medical Center, Danville), [http://www.geisinger.edu/education/commlib.shtml](http://www.geisinger.edu/education/commlib.shtml)

• **Pennsylvania:** HealthInfo Library (Moses Taylor Hospital, Scranton), [http://www.mth.org/healthwellness.html](http://www.mth.org/healthwellness.html)

• **Pennsylvania:** Hopwood Library (University of Pittsburgh, Health Sciences Library System, Pittsburgh), [http://www.hsls.pitt.edu/guides/chi/hopwood/index_html](http://www.hsls.pitt.edu/guides/chi/hopwood/index_html)

• **Pennsylvania:** Koop Community Health Information Center (College of Physicians of Philadelphia), [http://www.collphyphil.org/kooppg1.shtml](http://www.collphyphil.org/kooppg1.shtml)

• **Pennsylvania:** Learning Resources Center - Medical Library (Susquehanna Health System, Williamsport), [http://www.shscares.org/services/lrc/index.asp](http://www.shscares.org/services/lrc/index.asp)

• **Pennsylvania:** Medical Library (UPMC Health System, Pittsburgh), [http://www.upmc.edu/passavant/library.htm](http://www.upmc.edu/passavant/library.htm)

• **Quebec, Canada:** Medical Library (Montreal General Hospital), [http://www.mghlib.mcgill.ca/](http://www.mghlib.mcgill.ca/)
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- **South Dakota:** Rapid City Regional Hospital Medical Library (Rapid City Regional Hospital), [http://www.rcrh.org/Services/Library/Default.asp](http://www.rcrh.org/Services/Library/Default.asp)
- **Texas:** Houston HealthWays (Houston Academy of Medicine-Texas Medical Center Library), [http://hhw.library.tmc.edu/](http://hhw.library.tmc.edu/)
- **Washington:** Community Health Library (Kittitas Valley Community Hospital), [http://www.kvch.com/](http://www.kvch.com/)
- **Washington:** Southwest Washington Medical Center Library (Southwest Washington Medical Center, Vancouver), [http://www.swmedicalcenter.com/body.cfm?id=72](http://www.swmedicalcenter.com/body.cfm?id=72)
ONLINE GLOSSARIES

The Internet provides access to a number of free-to-use medical dictionaries. The National Library of Medicine has compiled the following list of online dictionaries:

- Multilingual Glossary of Technical and Popular Medical Terms in Eight European Languages (European Commission) - Danish, Dutch, English, French, German, Italian, Portuguese, and Spanish: http://allserv.rug.ac.be/~rvdstich/eugloss/welcome.html
- On-line Medical Dictionary (CancerWEB): http://cancerweb.ncl.ac.uk/omd/
- Rare Diseases Terms (Office of Rare Diseases): http://ord.aspensys.com/asp/diseases/diseases.asp

Beyond these, MEDLINEplus contains a very patient-friendly encyclopedia covering every aspect of medicine (licensed from A.D.A.M., Inc.). The ADAM Medical Encyclopedia can be accessed at http://www.nlm.nih.gov/medlineplus/encyclopedia.html. ADAM is also available on commercial Web sites such as drkoop.com (http://www.drkoop.com/) and Web MD (http://my.webmd.com/adam/asset/adam_disease_articles/a_to_z/a). The NIH suggests the following Web sites in the ADAM Medical Encyclopedia when searching for information on cannabis:

- Basic Guidelines for Cannabis
  Cannabis intoxication

- Background Topics for Cannabis
  Cannabis
  Drug abuse
  Drug abuse first aid
Marijuana

Online Dictionary Directories

The following are additional online directories compiled by the National Library of Medicine, including a number of specialized medical dictionaries:

- Medical Dictionaries: Medical & Biological (World Health Organization): http://www.who.int/hlt/virtuallibrary/English/diction.htm#Medical
- Patient Education: Glossaries (DMOZ Open Directory Project): http://dmoz.org/Health/Education/Patient_Education/Glossaries/
- Web of Online Dictionaries (Bucknell University): http://www.yourdictionary.com/diction5.html#medicine
CANNABIS DICTIONARY

The definitions below are derived from official public sources, including the National Institutes of Health [NIH] and the European Union [EU].

**Abdomen:** That portion of the body that lies between the thorax and the pelvis. [NIH]

**Abdominal:** Having to do with the abdomen, which is the part of the body between the chest and the hips that contains the pancreas, stomach, intestines, liver, gallbladder, and other organs. [NIH]

**Acetaldehyde:** A colorless, flammable liquid used in the manufacture of acetic acid, perfumes, and flavors. It is also an intermediate in the metabolism of alcohol. It has a general narcotic action and also causes irritation of mucous membranes. Large doses may cause death from respiratory paralysis. [NIH]

**Acetylcholine:** A neurotransmitter. Acetylcholine in vertebrates is the major transmitter at neuromuscular junctions, autonomic ganglia, parasympathetic effector junctions, a subset of sympathetic effector junctions, and at many sites in the central nervous system. It is generally not used as an administered drug because it is broken down very rapidly by cholinesterases, but it is useful in some ophthalmological applications. [NIH]

**Achievement:** Success in bringing an effort to the desired end; the degree or level of success attained in some specified area (esp. scholastic) or in general. [NIH]

**Adaptation:** 1. The adjustment of an organism to its environment, or the process by which it enhances such fitness. 2. The normal ability of the eye to adjust itself to variations in the intensity of light; the adjustment to such variations. 3. The decline in the frequency of firing of a neuron, particularly of a receptor, under conditions of constant stimulation. 4. In dentistry, (a) the proper fitting of a denture, (b) the degree of proximity and interlocking of restorative material to a tooth preparation, (c) the exact adjustment of bands to teeth. 5. In microbiology, the adjustment of bacterial physiology to a new environment. [EU]

**Adenosine:** A nucleoside that is composed of adenine and d-ribose. Adenosine or adenosine derivatives play many important biological roles in addition to being components of DNA and RNA. Adenosine itself is a neurotransmitter. [NIH]

**Adjustment:** The dynamic process wherein the thoughts, feelings, behavior, and biophysiological mechanisms of the individual continually change to adjust to the environment. [NIH]

**Adjuvant:** A substance which aids another, such as an auxiliary remedy; in immunology, nonspecific stimulator (e.g., BCG vaccine) of the immune response. [EU]

**Adolescence:** The period of life beginning with the appearance of secondary sex characteristics and terminating with the cessation of somatic growth. The years usually referred to as adolescence lie between 13 and 18 years of age. [NIH]

**Adrenergic:** Activated by, characteristic of, or secreting epinephrine or substances with similar activity; the term is applied to those nerve fibres that liberate norepinephrine at a synapse when a nerve impulse passes, i.e., the sympathetic fibres. [EU]

**Adverse Effect:** An unwanted side effect of treatment. [NIH]

**Aerosol:** A solution of a drug which can be atomized into a fine mist for inhalation therapy. [EU]

**Afferent:** Concerned with the transmission of neural impulse toward the central part of the
nervous system. [NIH]

**Age of Onset:** The age or period of life at which a disease or the initial symptoms or manifestations of a disease appear in an individual. [NIH]

**Agonist:** In anatomy, a prime mover. In pharmacology, a drug that has affinity for and stimulates physiologic activity at cell receptors normally stimulated by naturally occurring substances. [EU]

**Agoraphobia:** Obsessive, persistent, intense fear of open places. [NIH]

**Airway:** A device for securing unobstructed passage of air into and out of the lungs during general anesthesia. [NIH]

**Airway Obstruction:** Any hindrance to the passage of air into and out of the lungs. [NIH]

**Akathisia:** 1. A condition of motor restlessness in which there is a feeling of muscular quivering, an urge to move about constantly, and an inability to sit still, a common extrapyramidal side effect of neuroleptic drugs. 2. An inability to sit down because of intense anxiety at the thought of doing so. [EU]

**Aldehyde Dehydrogenase:** An enzyme that oxidizes an aldehyde in the presence of NAD+ and water to an acid and NADH. EC 1.2.1.3. Before 1978, it was classified as EC 1.1.1.70. [NIH]

**Alertness:** A state of readiness to detect and respond to certain specified small changes occurring at random intervals in the environment. [NIH]

**Alkaloid:** A member of a large group of chemicals that are made by plants and have nitrogen in them. Some alkaloids have been shown to work against cancer. [NIH]

**Allergens:** Antigen-type substances that produce immediate hypersensitivity (hypersensitivity, immediate). [NIH]

**Allylamine:** Possesses an unusual and selective cytotoxicity for vascular smooth muscle cells in dogs and rats. Useful for experiments dealing with arterial injury, myocardial fibrosis or cardiac decompensation. [NIH]

**Alternative medicine:** Practices not generally recognized by the medical community as standard or conventional medical approaches and used instead of standard treatments. Alternative medicine includes the taking of dietary supplements, megadose vitamins, and herbal preparations; the drinking of special teas; and practices such as massage therapy, magnet therapy, spiritual healing, and meditation. [NIH]

**Alveoli:** Tiny air sacs at the end of the bronchioles in the lungs. [NIH]

**Amine:** An organic compound containing nitrogen; any member of a group of chemical compounds formed from ammonia by replacement of one or more of the hydrogen atoms by organic (hydrocarbon) radicals. The amines are distinguished as primary, secondary, and tertiary, according to whether one, two, or three hydrogen atoms are replaced. The amines include allylamine, amylamine, ethylamine, methylamine, phenylamine, propylamine, and many other compounds. [EU]

**Amino acid:** Any organic compound containing an amino (-NH2 and a carboxyl (- COOH) group. The 20 a-amino acids listed in the accompanying table are the amino acids from which proteins are synthesized by formation of peptide bonds during ribosomal translation of messenger RNA; all except glycine, which is not optically active, have the L configuration. Other amino acids occurring in proteins, such as hydroxyproline in collagen, are formed by posttranslational enzymatic modification of amino acids residues in polypeptide chains. There are also several important amino acids, such as the neurotransmitter y-aminobutyric acid, that have no relation to proteins. Abbreviated AA. [EU]

**Amino Acid Sequence:** The order of amino acids as they occur in a polypeptide chain. This
is referred to as the primary structure of proteins. It is of fundamental importance in determining protein conformation. [NIH]

**Ammonia:** A colorless alkaline gas. It is formed in the body during decomposition of organic materials during a large number of metabolically important reactions. [NIH]

**Amphetamine:** A powerful central nervous system stimulant and sympathomimetic. Amphetamine has multiple mechanisms of action including blocking uptake of adrenergics and dopamine, stimulation of release of monamines, and inhibiting monoamine oxidase. Amphetamine is also a drug of abuse and a psychotomimetic. The l- and the d,l-forms are included here. The l-form has less central nervous system activity but stronger cardiovascular effects. The d-form is dextroamphetamine. [NIH]

**Amplification:** The production of additional copies of a chromosomal DNA sequence, found as either intrachromosomal or extrachromosomal DNA. [NIH]

**Amygdala:** Almond-shaped group of basal nuclei anterior to the inferior horn of the lateral ventricle of the brain, within the temporal lobe. The amygdala is part of the limbic system. [NIH]

**Anabolic:** Relating to, characterized by, or promoting anabolism. [EU]

**Anabolic Steroids:** Chemical derivatives of testosterone that are used for anabolic promotion of growth and repair of body tissues and the development of male sexual characteristics. [NIH]

**Anaesthesia:** Loss of feeling or sensation. Although the term is used for loss of tactile sensibility, or of any of the other senses, it is applied especially to loss of the sensation of pain, as it is induced to permit performance of surgery or other painful procedures. [EU]

**Anal:** Having to do with the anus, which is the posterior opening of the large bowel. [NIH]

**Analgesic:** An agent that alleviates pain without causing loss of consciousness. [EU]

**Analogous:** Resembling or similar in some respects, as in function or appearance, but not in origin or development.; [EU]

**Anatomical:** Pertaining to anatomy, or to the structure of the organism. [EU]

**Anesthesia:** A state characterized by loss of feeling or sensation. This depression of nerve function is usually the result of pharmacologic action and is induced to allow performance of surgery or other painful procedures. [NIH]

**Anesthetics:** Agents that are capable of inducing a total or partial loss of sensation, especially tactile sensation and pain. They may act to induce general anesthesia, in which an unconscious state is achieved, or may act locally to induce numbness or lack of sensation at a targeted site. [NIH]

**Animal model:** An animal with a disease either the same as or like a disease in humans. Animal models are used to study the development and progression of diseases and to test new treatments before they are given to humans. Animals with transplanted human cancers or other tissues are called xenograft models. [NIH]

**Anisotropy:** A physical property showing different values in relation to the direction in or along which the measurement is made. The physical property may be with regard to thermal or electric conductivity or light refraction. In crystallography, it describes crystals whose index of refraction varies with the direction of the incident light. It is also called acolotropy and colotropy. The opposite of anisotropy is isotropy wherein the same values characterize the object when measured along axes in all directions. [NIH]

**Anomalies:** Birth defects; abnormalities. [NIH]

**Anorexia:** Clinical manifestation consisting of a physiopathological lack or loss of appetite
accompanied by an aversion to food and the inability to eat. [NIH]

**Antagonism:** Interference with, or inhibition of, the growth of a living organism by another living organism, due either to creation of unfavorable conditions (e.g., exhaustion of food supplies) or to production of a specific antibiotic substance (e.g., penicillin). [NIH]

**Antecedent:** Existing or occurring before in time or order often with consequential effects. [EU]

**Anti-Anxiety Agents:** Agents that alleviate anxiety, tension, and neurotic symptoms, promote sedation, and have a calming effect without affecting clarity of consciousness or neurologic conditions. Some are also effective as anticonvulsants, muscle relaxants, or anesthesia adjuvants. Adrenergic beta-antagonists are commonly used in the symptomatic treatment of anxiety but are not included here. [NIH]

**Antibody:** A type of protein made by certain white blood cells in response to a foreign substance (antigen). Each antibody can bind to only a specific antigen. The purpose of this binding is to help destroy the antigen. Antibodies can work in several ways, depending on the nature of the antigen. Some antibodies destroy antigens directly. Others make it easier for white blood cells to destroy the antigen. [NIH]

**Anticonvulsants:** Drugs used to prevent seizures or reduce their severity. [NIH]

**Antidepressant:** A drug used to treat depression. [NIH]

**Antiemetic:** An agent that prevents or alleviates nausea and vomiting. Also antinauseant. [EU]

**Antigen:** Any substance which is capable, under appropriate conditions, of inducing a specific immune response and of reacting with the products of that response, that is, with specific antibody or specifically sensitized T-lymphocytes, or both. Antigens may be soluble substances, such as toxins and foreign proteins, or particulate, such as bacteria and tissue cells; however, only the portion of the protein or polysaccharide molecule known as the antigenic determinant (q.v.) combines with antibody or a specific receptor on a lymphocyte. Abbreviated Ag. [EU]

**Antimanic Agents:** Agents that are used to treat bipolar disorders or mania associated with other affective disorders. [NIH]

**Antioxidant:** A substance that prevents damage caused by free radicals. Free radicals are highly reactive chemicals that often contain oxygen. They are produced when molecules are split to give products that have unpaired electrons. This process is called oxidation. [NIH]

**Antipsychotic:** Effective in the treatment of psychosis. Antipsychotic drugs (called also neuroleptic drugs and major tranquilizers) are a chemically diverse (including phenothiazines, thioxanthenes, butyrophenones, dibenzoxazepines, dibenzodiazepines, and diphenylbutylpiperidines) but pharmacologically similar class of drugs used to treat schizophrenic, paranoid, schizoaffective, and other psychotic disorders; acute delirium and dementia, and manic episodes (during induction of lithium therapy); to control the movement disorders associated with Huntington's chorea, Gilles de la Tourette's syndrome, and ballismus; and to treat intractable hiccups and severe nausea and vomiting. Antipsychotic agents bind to dopamine, histamine, muscarinic cholinergic, a-adrenergic, and serotonin receptors. Blockade of dopaminergic transmission in various areas is thought to be responsible for their major effects: antipsychotic action by blockade in the mesolimbic and mesocortical areas; extrapyramidal side effects (dystonia, akathisia, parkinsonism, and tardive dyskinesia) by blockade in the basal ganglia; and antiemetic effects by blockade in the chemoreceptor trigger zone of the medulla. Sedation and autonomic side effects (orthostatic hypotension, blurred vision, dry mouth, nasal congestion and constipation) are caused by blockade of histamine, cholinergic, and adrenergic receptors. [EU]
**Antipsychotic Agents:** Agents that control agitated psychotic behavior, alleviate acute psychotic states, reduce psychotic symptoms, and exert a quieting effect. They are used in schizophrenia, senile dementia, transient psychosis following surgery or myocardial infarction, etc. These drugs are often referred to as neuroleptics alluding to the tendency to produce neurological side effects, but not all antipsychotics are likely to produce such effects. Many of these drugs may also be effective against nausea, emesis, and pruritus. [NIH]

**Anus:** The opening of the rectum to the outside of the body. [NIH]

**Anxiety Disorders:** Disorders in which anxiety (persistent feelings of apprehension, tension, or uneasiness) is the predominant disturbance. [NIH]

**Anxiolytic:** An anxiolytic or antianxiety agent. [EU]

**Apathy:** Lack of feeling or emotion; indifference. [EU]

**Aptitude:** The ability to acquire general or special types of knowledge or skill. [NIH]

**Arachidonic Acid:** An unsaturated, essential fatty acid. It is found in animal and human fat as well as in the liver, brain, and glandular organs, and is a constituent of animal phosphatides. It is formed by the synthesis from dietary linoleic acid and is a precursor in the biosynthesis of prostaglandins, thromboxanes, and leukotrienes. [NIH]

**Arterial:** Pertaining to an artery or to the arteries. [EU]

**Arteries:** The vessels carrying blood away from the heart. [NIH]

**Arteritis:** Inflammation of an artery. [NIH]

**Artery:** Vessel-carrying blood from the heart to various parts of the body. [NIH]

**Ascorbic Acid:** A six carbon compound related to glucose. It is found naturally in citrus fruits and many vegetables. Ascorbic acid is an essential nutrient in human diets, and necessary to maintain connective tissue and bone. Its biologically active form, vitamin C, functions as a reducing agent and coenzyme in several metabolic pathways. Vitamin C is considered an antioxidant. [NIH]

**Asphyxia:** A pathological condition caused by lack of oxygen, manifested in impending or actual cessation of life. [NIH]

**Assay:** Determination of the amount of a particular constituent of a mixture, or of the biological or pharmacological potency of a drug. [EU]

**Astrocytes:** The largest and most numerous neuroglial cells in the brain and spinal cord. Astrocytes (from "star" cells) are irregularly shaped with many long processes, including those with "end feet" which form the glial (limiting) membrane and directly and indirectly contribute to the blood brain barrier. They regulate the extracellular ionic and chemical environment, and "reactive astrocytes" (along with microglia) respond to injury. Astrocytes have high-affinity transmitter uptake systems, voltage-dependent and transmitter-gated ion channels, and can release transmitter, but their role in signaling (as in many other functions) is not well understood. [NIH]

**Atrial:** Pertaining to an atrium. [EU]

**Atrium:** A chamber; used in anatomical nomenclature to designate a chamber affording entrance to another structure or organ. Usually used alone to designate an atrium of the heart. [EU]

**Atrophy:** Decrease in the size of a cell, tissue, organ, or multiple organs, associated with a variety of pathological conditions such as abnormal cellular changes, ischemia, malnutrition, or hormonal changes. [NIH]

**Atropine:** A toxic alkaloid, originally from Atropa belladonna, but found in other plants, mainly Solanaceae. [NIH]
Atypical: Irregular; not conformable to the type; in microbiology, applied specifically to strains of unusual type. [EU]

Auditory: Pertaining to the sense of hearing. [EU]

Autoimmune disease: A condition in which the body recognizes its own tissues as foreign and directs an immune response against them. [NIH]

Automobile Driving: The effect of environmental or physiological factors on the driver and driving ability. Included are driving fatigue, and the effect of drugs, disease, and physical disabilities on driving. [NIH]

Autonomic: Self-controlling; functionally independent. [EU]

Autonomic Nervous System: The enteric, parasympathetic, and sympathetic nervous systems taken together. Generally speaking, the autonomic nervous system regulates the internal environment during both peaceful activity and physical or emotional stress. Autonomic activity is controlled and integrated by the central nervous system, especially the hypothalamus and the solitary nucleus, which receive information relayed from visceral afferents; these and related central and sensory structures are sometimes (but not here) considered to be part of the autonomic nervous system itself. [NIH]

Autopsy: Postmortem examination of the body. [NIH]

Bactericidal: Substance lethal to bacteria; substance capable of killing bacteria. [NIH]

Bacteriuria: The presence of bacteria in the urine with or without consequent urinary tract infection. Since bacteriuria is a clinical entity, the term does not preclude the use of urine/microbiology for technical discussions on the isolation and segregation of bacteria in the urine. [NIH]

Barbiturates: A class of chemicals derived from barbituric acid or thiobarbituric acid. Many of these are medically important as sedatives and hypnotics (sedatives, barbiturate), as anesthetics, or as anticonvulsants. [NIH]

Basal Ganglia: Large subcortical nuclear masses derived from the telencephalon and located in the basal regions of the cerebral hemispheres. [NIH]

Base: In chemistry, the nonacid part of a salt; a substance that combines with acids to form salts; a substance that dissociates to give hydroxide ions in aqueous solutions; a substance whose molecule or ion can combine with a proton (hydrogen ion); a substance capable of donating a pair of electrons (to an acid) for the formation of a coordinate covalent bond. [EU]

Belladonna: A species of very poisonous Solanaceous plants yielding atropine (hyoscyamine), scopolamine, and other belladonna alkaloids, used to block the muscarinic autonomic nervous system. [NIH]

Benign: Not cancerous; does not invade nearby tissue or spread to other parts of the body. [NIH]

Benzene: Toxic, volatile, flammable liquid hydrocarbon biproduct of coal distillation. It is used as an industrial solvent in paints, varnishes, lacquer thinners, gasoline, etc. Benzene causes central nervous system damage acutely and bone marrow damage chronically and is carcinogenic. It was formerly used as parasiticide. [NIH]

Benzodiazepines: A two-ring heterocyclic compound consisting of a benzene ring fused to a diazepine ring. Permitted is any degree of hydrogenation, any substituents and any H-isomer. [NIH]

Bile: An emulsifying agent produced in the liver and secreted into the duodenum. Its composition includes bile acids and salts, cholesterol, and electrolytes. It aids digestion of fats in the duodenum. [NIH]
Biochemical: Relating to biochemistry; characterized by, produced by, or involving chemical reactions in living organisms. [EU]

Biological response modifier: BRM. A substance that stimulates the body's response to infection and disease. [NIH]

Biosynthesis: The building up of a chemical compound in the physiologic processes of a living organism. [EU]

Biotransformation: The chemical alteration of an exogenous substance by or in a biological system. The alteration may inactivate the compound or it may result in the production of an active metabolite of an inactive parent compound. The alteration may be either non-synthetic (oxidation-reduction, hydrolysis) or synthetic (glucuronide formation, sulfate conjugation, acetylation, methylation). This also includes metabolic detoxication and clearance. [NIH]

Bipolar Disorder: A major affective disorder marked by severe mood swings (manic or major depressive episodes) and a tendency to remission and recurrence. [NIH]

Bladder: The organ that stores urine. [NIH]

Blood Platelets: Non-nucleated disk-shaped cells formed in the megakaryocyte and found in the blood of all mammals. They are mainly involved in blood coagulation. [NIH]

Blood pressure: The pressure of blood against the walls of a blood vessel or heart chamber. Unless there is reference to another location, such as the pulmonary artery or one of the heart chambers, it refers to the pressure in the systemic arteries, as measured, for example, in the forearm. [NIH]

Blood vessel: A tube in the body through which blood circulates. Blood vessels include a network of arteries, arterioles, capillaries, venules, and veins. [NIH]

Body Fluids: Liquid components of living organisms. [NIH]

Body Image: Individuals' personal concept of their bodies as objects in and bound by space, independently and apart from all other objects. [NIH]

Bone metastases: Cancer that has spread from the original (primary) tumor to the bone. [NIH]

Bowel: The long tube-shaped organ in the abdomen that completes the process of digestion. There is both a small and a large bowel. Also called the intestine. [NIH]

Bowel Movement: Body wastes passed through the rectum and anus. [NIH]

Branch: Most commonly used for branches of nerves, but applied also to other structures. [NIH]

Breakdown: A physical, metal, or nervous collapse. [NIH]

Breast Feeding: The nursing of an infant at the mother's breast. [NIH]

Cachexia: General ill health, malnutrition, and weight loss, usually associated with chronic disease. [NIH]

Caffeine: A methylxanthine naturally occurring in some beverages and also used as a pharmacological agent. Caffeine's most notable pharmacological effect is as a central nervous system stimulant, increasing alertness and producing agitation. It also relaxes smooth muscle, stimulates cardiac muscle, stimulates diuresis, and appears to be useful in the treatment of some types of headache. Several cellular actions of caffeine have been observed, but it is not entirely clear how each contributes to its pharmacological profile. Among the most important are inhibition of cyclic nucleotide phosphodiesterases, antagonism of adenosine receptors, and modulation of intracellular calcium handling. [NIH]

Calcium: A basic element found in nearly all organized tissues. It is a member of the
alkaline earth family of metals with the atomic symbol Ca, atomic number 20, and atomic weight 40. Calcium is the most abundant mineral in the body and combines with phosphorus to form calcium phosphate in the bones and teeth. It is essential for the normal functioning of nerves and muscles and plays a role in blood coagulation (as factor IV) and in many enzymatic processes. [NIH]

**Cannabidiol:** Compound isolated from Cannabis sativa extract. [NIH]

**Cannabinoids:** Compounds extracted from Cannabis sativa L. and metabolites having the cannabinoid structure. The most active constituents are tetrahydrocannabinol, cannabidiol, and cannabigerol. [NIH]

**Cannabinol:** A physiologically inactive constituent of Cannabis sativa L. [NIH]

**Cannabis:** The hemp plant Cannabis sativa. Products prepared from the dried flowering tops of the plant include marijuana, hashish, bhang, and ganja. [NIH]

**Cannabis sativa:** The separated resin, whether crude or purified, obtained from the cannabis plant. [NIH]

**Carbon Dioxide:** A colorless, odorless gas that can be formed by the body and is necessary for the respiration cycle of plants and animals. [NIH]

**Carcinogenic:** Producing carcinoma. [EU]

**Carcinoma:** Cancer that begins in the skin or in tissues that line or cover internal organs. [NIH]

**Cardiac:** Having to do with the heart. [NIH]

**Cardiomyopathy:** A general diagnostic term designating primary myocardial disease, often of obscure or unknown etiology. [EU]

**Cardiovascular:** Having to do with the heart and blood vessels. [NIH]

**Cardiovascular System:** The heart and the blood vessels by which blood is pumped and circulated through the body. [NIH]

**Carrier Proteins:** Transport proteins that carry specific substances in the blood or across cell membranes. [NIH]

**Case series:** A group or series of case reports involving patients who were given similar treatment. Reports of case series usually contain detailed information about the individual patients. This includes demographic information (for example, age, gender, ethnic origin) and information on diagnosis, treatment, response to treatment, and follow-up after treatment. [NIH]

**Catalepsy:** A condition characterized by inactivity, decreased responsiveness to stimuli, and a tendency to maintain an immobile posture. The limbs tend to remain in whatever position they are placed (waxy flexibility). Catalepsy may be associated with psychotic disorders (e.g., schizophrenia, catatonic), nervous system drug toxicity, and other conditions. [NIH]

**Catecholamine:** A group of chemical substances manufactured by the adrenal medulla and secreted during physiological stress. [NIH]

**Cell:** The individual unit that makes up all of the tissues of the body. All living things are made up of one or more cells. [NIH]

**Cell Cycle:** The complex series of phenomena, occurring between the end of one cell division and the end of the next, by which cellular material is divided between daughter cells. [NIH]

**Cell Division:** The fission of a cell. [NIH]
**Cell Respiration**: The metabolic process of all living cells (animal and plant) in which oxygen is used to provide a source of energy for the cell. [NIH]

**Cellulose**: A polysaccharide with glucose units linked as in cellobiose. It is the chief constituent of plant fibers, cotton being the purest natural form of the substance. As a raw material, it forms the basis for many derivatives used in chromatography, ion exchange materials, explosives manufacturing, and pharmaceutical preparations. [NIH]

**Censorship**: Psychoanalytic term for the coercive influence of the ego and the super-ego upon the impulses of the id. [NIH]

**Central Nervous System**: The main information-processing organs of the nervous system, consisting of the brain, spinal cord, and meninges. [NIH]

**Central Nervous System Infections**: Pathogenic infections of the brain, spinal cord, and meninges. DNA virus infections; RNA virus infections; bacterial infections; mycoplasma infections; Spirochaetales infections; fungal infections; protozoan infections; helminthiasis; and prion diseases may involve the central nervous system as a primary or secondary process. [NIH]

**Cerebellum**: Part of the metencephalon that lies in the posterior cranial fossa behind the brain stem. It is concerned with the coordination of movement. [NIH]

**Cerebral**: Of or pertaining of the cerebrum or the brain. [EU]

**Cerebral hemispheres**: The two halves of the cerebrum, the part of the brain that controls muscle functions of the body and also controls speech, emotions, reading, writing, and learning. The right hemisphere controls muscle movement on the left side of the body, and the left hemisphere controls muscle movement on the right side of the body. [NIH]

**Cerebrum**: The largest part of the brain. It is divided into two hemispheres, or halves, called the cerebral hemispheres. The cerebrum controls muscle functions of the body and also controls speech, emotions, reading, writing, and learning. [NIH]

**Chemoreceptor**: A receptor adapted for excitation by chemical substances, e.g., olfactory and gustatory receptors, or a sense organ, as the carotid body or the aortic (supracardial) bodies, which is sensitive to chemical changes in the blood stream, especially reduced oxygen content, and reflexly increases both respiration and blood pressure. [EU]

**Chemotherapy**: Treatment with anticancer drugs. [NIH]

**Chin**: The anatomical frontal portion of the mandible, also known as the mentum, that contains the line of fusion of the two separate halves of the mandible (symphysis menti). This line of fusion divides inferiorly to enclose a triangular area called the mental protuberance. On each side, inferior to the second premolar tooth, is the mental foramen for the passage of blood vessels and a nerve. [NIH]

**Chloroform**: A commonly used laboratory solvent. It was previously used as an anesthetic, but was banned from use in the U.S. due to its suspected carcinogenicity. [NIH]

**Chlorpromazine**: The prototypical phenothiazine antipsychotic drug. Like the other drugs in this class chlorpromazine's antipsychotic actions are thought to be due to long-term adaptation by the brain to blocking dopamine receptors. Chlorpromazine has several other actions and therapeutic uses, including as an antiemetic and in the treatment of intractable hiccups. [NIH]

**Cholera**: An acute diarrheal disease endemic in India and Southeast Asia whose causative agent is vibrio cholerae. This condition can lead to severe dehydration in a matter of hours unless quickly treated. [NIH]

**Cholinergic**: Resembling acetylcholine in pharmacological action; stimulated by or releasing acetylcholine or a related compound. [EU]
**Chorea:** Involuntary, forcible, rapid, jerky movements that may be subtle or become confluent, markedly altering normal patterns of movement. Hypotonia and pendular reflexes are often associated. Conditions which feature recurrent or persistent episodes of chorea as a primary manifestation of disease are referred to as choreatic disorders. Chorea is also a frequent manifestation of basal ganglia diseases. [NIH]

**Chromosomal:** Pertaining to chromosomes. [EU]

**Chronic:** A disease or condition that persists or progresses over a long period of time. [NIH]

**Chronic Disease:** Disease or ailment of long duration. [NIH]

**Cisplatin:** An inorganic and water-soluble platinum complex. After undergoing hydrolysis, it reacts with DNA to produce both intra and interstrand crosslinks. These crosslinks appear to impair replication and transcription of DNA. The cytotoxicity of cisplatin correlates with cellular arrest in the G2 phase of the cell cycle. [NIH]

**Citrus:** Any tree or shrub of the Rue family or the fruit of these plants. [NIH]

**Clear cell carcinoma:** A rare type of tumor of the female genital tract in which the inside of the cells looks clear when viewed under a microscope. [NIH]

**Clinical trial:** A research study that tests how well new medical treatments or other interventions work in people. Each study is designed to test new methods of screening, prevention, diagnosis, or treatment of a disease. [NIH]

**Coca:** Any of several South American shrubs of the Erythroxylon genus (and family) that yield cocaine; the leaves are chewed with alum for CNS stimulation. [NIH]

**Cocaine:** An alkaloid ester extracted from the leaves of plants including coca. It is a local anesthetic and vasoconstrictor and is clinically used for that purpose, particularly in the eye, ear, nose, and throat. It also has powerful central nervous system effects similar to the amphetamines and is a drug of abuse. Cocaine, like amphetamines, acts by multiple mechanisms on brain catecholaminergic neurons; the mechanism of its reinforcing effects is thought to involve inhibition of dopamine uptake. [NIH]

**Coenzyme:** An organic nonprotein molecule, frequently a phosphorylated derivative of a water-soluble vitamin, that binds with the protein molecule (apoenzyme) to form the active enzyme (holoenzyme). [EU]

**Cofactor:** A substance, microorganism or environmental factor that activates or enhances the action of another entity such as a disease-causing agent. [NIH]

**Cognition:** Intellectual or mental process whereby an organism becomes aware of or obtains knowledge. [NIH]

**Collagen:** A polypeptide substance comprising about one third of the total protein in mammalian organisms. It is the main constituent of skin, connective tissue, and the organic substance of bones and teeth. Different forms of collagen are produced in the body but all consist of three alpha-polypeptide chains arranged in a triple helix. Collagen is differentiated from other fibrous proteins, such as elastin, by the content of proline, hydroxyproline, and hydroxylysine; by the absence of tryptophan; and particularly by the high content of polar groups which are responsible for its swelling properties. [NIH]

**Comorbidity:** The presence of co-existing or additional diseases with reference to an initial diagnosis or with reference to the index condition that is the subject of study. Comorbidity may affect the ability of affected individuals to function and also their survival; it may be used as a prognostic indicator for length of hospital stay, cost factors, and outcome or survival. [NIH]

**Complementary medicine:** Practices not generally recognized by the medical community as standard or conventional medical approaches and used to enhance or complement the
standard treatments. Complementary medicine includes the taking of dietary supplements, megadose vitamins, and herbal preparations; the drinking of special teas; and practices such as massage therapy, magnet therapy, spiritual healing, and meditation. [NIH]

**Computational Biology:** A field of biology concerned with the development of techniques for the collection and manipulation of biological data, and the use of such data to make biological discoveries or predictions. This field encompasses all computational methods and theories applicable to molecular biology and areas of computer-based techniques for solving biological problems including manipulation of models and datasets. [NIH]

**Concomitant:** Accompanying; accessory; joined with another. [EU]

**Conduction:** The transfer of sound waves, heat, nervous impulses, or electricity. [EU]

**Confounding:** Extraneous variables resulting in outcome effects that obscure or exaggerate the "true" effect of an intervention. [NIH]

**Confusion:** A mental state characterized by bewilderment, emotional disturbance, lack of clear thinking, and perceptual disorientation. [NIH]

**Congestion:** Excessive or abnormal accumulation of blood in a part. [EU]

**Connective Tissue:** Tissue that supports and binds other tissues. It consists of connective tissue cells embedded in a large amount of extracellular matrix. [NIH]

**Coronary:** Encircling in the manner of a crown; a term applied to vessels; nerves, ligaments, etc. The term usually denotes the arteries that supply the heart muscle and, by extension, a pathologic involvement of them. [EU]

**Coronary Thrombosis:** Presence of a thrombus in a coronary artery, often causing a myocardial infarction. [NIH]

**Cortex:** The outer layer of an organ or other body structure, as distinguished from the internal substance. [EU]

**Cortical:** Pertaining to or of the nature of a cortex or bark. [EU]

**Cortices:** The outer layer of an organ; used especially of the cerebrum and cerebellum. [NIH]

**Cranial:** Pertaining to the cranium, or to the anterior (in animals) or superior (in humans) end of the body. [EU]
**Cannabis**

**Craniocerebral Trauma:** Traumatic injuries involving the cranium and intracranial structures (i.e., brain; cranial nerves; meninges; and other structures). Injuries may be classified by whether or not the skull is penetrated (i.e., penetrating vs. nonpenetrating) or whether there is an associated hemorrhage. [NIH]

**Curative:** Tending to overcome disease and promote recovery. [EU]

**Cyanide:** An extremely toxic class of compounds that can be lethal on inhaling of ingesting in minute quantities. [NIH]

**Cyclic:** Pertaining to or occurring in a cycle or cycles; the term is applied to chemical compounds that contain a ring of atoms in the nucleus. [EU]

**Cytotoxicity:** Quality of being capable of producing a specific toxic action upon cells of special organs. [NIH]

**Databases, Bibliographic:** Extensive collections, reputedly complete, of references and citations to books, articles, publications, etc., generally on a single subject or specialized subject area. Databases can operate through automated files, libraries, or computer disks. The concept should be differentiated from factual databases which is used for collections of data and facts apart from bibliographic references to them. [NIH]

**Deamination:** The removal of an amino group (NH2) from a chemical compound. [NIH]

**Degenerative:** Undergoing degeneration: tending to degenerate; having the character of or involving degeneration; causing or tending to cause degeneration. [EU]

**Dehydration:** The condition that results from excessive loss of body water. [NIH]

**Delirium:** (DSM III-R) an acute, reversible organic mental disorder characterized by reduced ability to maintain attention to external stimuli and disorganized thinking as manifested by rambling, irrelevant, or incoherent speech; there are also a reduced level of consciousness, sensory misperceptions, disturbance of the sleep-wakefulness cycle and level of psychomotor activity, disorientation to time, place, or person, and memory impairment. Delirium may be caused by a large number of conditions resulting in derangement of cerebral metabolism, including systemic infection, poisoning, drug intoxication or withdrawal, seizures or head trauma, and metabolic disturbances such as hypoxia, hypoglycaemia, fluid, electrolyte, or acid-base imbalances, or hepatic or renal failure. Called also acute confusional state and acute brain syndrome. [EU]

**Delusion:** A false belief, not susceptible to argument or reason, and determined, pathologically, by some form of mental disorder. [NIH]

**Dementia:** An acquired organic mental disorder with loss of intellectual abilities of sufficient severity to interfere with social or occupational functioning. The dysfunction is multifaceted and involves memory, behavior, personality, judgment, attention, spatial relations, language, abstract thought, and other executive functions. The intellectual decline is usually progressive, and initially spares the level of consciousness. [NIH]

**Depersonalization:** Alteration in the perception of the self so that the usual sense of one's own reality is lost, manifested in a sense of unreality or self-estrangement, in changes of body image, or in a feeling that one does not control his own actions and speech; seen in depersonalization disorder, schizophrenic disorders, and schizotypal personality disorder. Some do not draw a distinction between depersonalization and derealization, using depersonalization to include both. [EU]

**Deprivation:** Loss or absence of parts, organs, powers, or things that are needed. [EU]

**Derealization:** Is characterized by the loss of the sense of reality concerning one's surroundings. [NIH]

**DES:** Diethylstilbestrol. A synthetic hormone that was prescribed from the early 1940s until
1971 to help women with complications of pregnancy. DES has been linked to an increased risk of clear cell carcinoma of the vagina in daughters of women who used DES. DES may also increase the risk of breast cancer in women who used DES. [NIH]

**Deuterium:** Deuterium. The stable isotope of hydrogen. It has one neutron and one proton in the nucleus. [NIH]

**Dextroamphetamine:** The d-form of amphetamine. It is a central nervous system stimulant and a sympathomimetic. It has also been used in the treatment of narcolepsy and of attention deficit disorders and hyperactivity in children. Dextroamphetamine has multiple mechanisms of action including blocking uptake of adrenergics and dopamine, stimulating release of monamines, and inhibiting monoamine oxidase. It is also a drug of abuse and a psychotomimetic. [NIH]

**Diagnostic procedure:** A method used to identify a disease. [NIH]

**Diencephalon:** The paired caudal parts of the prosencephalon from which the thalamus, hypothalamus, epithalamus, and subthalamus are derived. [NIH]

**Digestion:** The process of breakdown of food for metabolism and use by the body. [NIH]

**Digestive system:** The organs that take in food and turn it into products that the body can use to stay healthy. Waste products the body cannot use leave the body through bowel movements. The digestive system includes the salivary glands, mouth, esophagus, stomach, liver, pancreas, gallbladder, small and large intestines, and rectum. [NIH]

**Digitalis:** A genus of toxic herbaceous Eurasian plants of the Scrophulaceae which yield cardiotonic glycosides. The most useful are Digitalis lanata and D. purpurea. [NIH]

**Diploid:** Having two sets of chromosomes. [NIH]

**Direct:** 1. Straight; in a straight line. 2. Performed immediately and without the intervention of subsidiary means. [EU]

**Discrimination:** The act of qualitative and/or quantitative differentiation between two or more stimuli. [NIH]

**Disinfectant:** An agent that disinfects; applied particularly to agents used on inanimate objects. [EU]

**Disposition:** A tendency either physical or mental toward certain diseases. [EU]

**Distal:** Remote; farther from any point of reference; opposed to proximal. In dentistry, used to designate a position on the dental arch farther from the median line of the jaw. [EU]

**Disulfiram:** A carbamate derivative used as an alcohol deterrent. It is a relatively nontoxic substance when administered alone, but markedly alters the intermediary metabolism of alcohol. When alcohol is ingested after administration of disulfiram, blood acetaldehyde concentrations are increased, followed by flushing, systemic vasodilation, respiratory difficulties, nausea, hypotension, and other symptoms (acetaldehyde syndrome). It acts by inhibiting aldehyde dehydrogenase. [NIH]

**Diuresis:** Increased excretion of urine. [EU]

**Dizziness:** An imprecise term which may refer to a sense of spatial disorientation, motion of the environment, or lightheadedness. [NIH]

**Dopamine:** An endogenous catecholamine and prominent neurotransmitter in several systems of the brain. In the synthesis of catecholamines from tyrosine, it is the immediate precursor to norepinephrine and epinephrine. Dopamine is a major transmitter in the extrapyramidal system of the brain, and important in regulating movement. A family of dopaminergic receptor subtypes mediate its action. Dopamine is used pharmacologically for its direct (beta adrenergic agonist) and indirect (adrenergic releasing) sympathomimetic
Cannabis

effects including its actions as an inotropic agent and as a renal vasodilator. [NIH]

**Double-blind:** Pertaining to a clinical trial or other experiment in which neither the subject nor the person administering treatment knows which treatment any particular subject is receiving. [EU]

**Drive:** A state of internal activity of an organism that is a necessary condition before a given stimulus will elicit a class of responses; e.g., a certain level of hunger (drive) must be present before food will elicit an eating response. [NIH]

**Drug Evaluation:** Any process by which toxicity, metabolism, absorption, elimination, preferred route of administration, safe dosage range, etc., for a drug or group of drugs is determined through clinical assessment in humans or veterinary animals. [NIH]

**Drug Evaluation, Preclinical:** Preclinical testing of drugs in experimental animals or in vitro for their biological and toxic effects and potential clinical applications. [NIH]

**Drug Interactions:** The action of a drug that may affect the activity, metabolism, or toxicity of another drug. [NIH]

**Drug Tolerance:** Progressive diminution of the susceptibility of a human or animal to the effects of a drug, resulting from its continued administration. It should be differentiated from drug resistance wherein an organism, disease, or tissue fails to respond to the intended effectiveness of a chemical or drug. It should also be differentiated from maximum tolerated dose and no-observed-adverse-effect level. [NIH]

**Drug Toxicity:** Manifestations of the adverse effects of drugs administered therapeutically or in the course of diagnostic techniques. It does not include accidental or intentional poisoning for which specific headings are available. [NIH]

**Dyskinesia:** Impairment of the power of voluntary movement, resulting in fragmentary or incomplete movements. [EU]

**Dysphoric:** A feeling of unpleasantness and discomfort. [NIH]

**Dyspnea:** Difficult or labored breathing. [NIH]

**Dystonia:** Disordered tonicity of muscle. [EU]

**Effector:** It is often an enzyme that converts an inactive precursor molecule into an active second messenger. [NIH]

**Efficacy:** The extent to which a specific intervention, procedure, regimen, or service produces a beneficial result under ideal conditions. Ideally, the determination of efficacy is based on the results of a randomized control trial. [NIH]

**Effusion:** The escape of fluid into a part or tissue, as an exudation or a transudation. [EU]

**Ego:** The conscious portion of the personality structure which serves to mediate between the demands of the primitive instinctual drives, (the id), of internalized parental and social prohibitions or the conscience, (the superego), and of reality. [NIH]

**Elastin:** The protein that gives flexibility to tissues. [NIH]

**Electrophysiological:** Pertaining to electrophysiology, that is a branch of physiology that is concerned with the electric phenomena associated with living bodies and involved in their functional activity. [EU]

**Embryo:** The prenatal stage of mammalian development characterized by rapid morphological changes and the differentiation of basic structures. [NIH]

**Embryo Transfer:** Removal of a mammalian embryo from one environment and replacement in the same or a new environment. The embryo is usually in the pre-nidation phase, i.e., a blastocyst. The process includes embryo or blastocyst transplantation or transfer after in vitro fertilization and transfer of the inner cell mass of the blastocyst. It is
not used for transfer of differentiated embryonic tissue, e.g., germ layer cells. [NIH]

**Empirical:** A treatment based on an assumed diagnosis, prior to receiving confirmatory laboratory test results. [NIH]

**Endemic:** Present or usually prevalent in a population or geographical area at all times; said of a disease or agent. Called also endemial. [EU]

**Endogenous:** Produced inside an organism or cell. The opposite is external (exogenous) production. [NIH]

**Endorphins:** One of the three major groups of endogenous opioid peptides. They are large peptides derived from the pro-opiomelanocortin precursor. The known members of this group are alpha-, beta-, and gamma-endorphin. The term endorphin is also sometimes used to refer to all opioid peptides, but the narrower sense is used here; opioid peptides is used for the broader group. [NIH]

**Enkephalins:** One of the three major families of endogenous opioid peptides. The enkephalins are pentapeptides that are widespread in the central and peripheral nervous systems and in the adrenal medulla. [NIH]

**Environmental Health:** The science of controlling or modifying those conditions, influences, or forces surrounding man which relate to promoting, establishing, and maintaining health. [NIH]

**Enzyme:** A protein that speeds up chemical reactions in the body. [NIH]

**Epidermal:** Pertaining to or resembling epidermis. Called also epidermic or epidermoid. [EU]

**Epinephrine:** The active sympathomimetic hormone from the adrenal medulla in most species. It stimulates both the alpha- and beta-adrenergic systems, causes systemic vasoconstriction and gastrointestinal relaxation, stimulates the heart, and dilates bronchi and cerebral vessels. It is used in asthma and cardiac failure and to delay absorption of local anesthetics. [NIH]

**Epithalamus:** The dorsal posterior subdivision of the diencephalon. The epithalamus is generally considered to include the habenular nuclei (habenula) and associated fiber bundles, the pineal body, and the epithelial roof of the third ventricle. The anterior and posterior paraventricular nuclei of the thalamus are included with the thalamic nuclei although they develop from the same pronuclear mass as the epithalamic nuclei and are sometimes considered part of the epithalamus. [NIH]

**Esophagus:** The muscular tube through which food passes from the throat to the stomach. [NIH]

**Estrogen:** One of the two female sex hormones. [NIH]

**Ethanol:** A clear, colorless liquid rapidly absorbed from the gastrointestinal tract and distributed throughout the body. It has bactericidal activity and is used often as a topical disinfectant. It is widely used as a solvent and preservative in pharmaceutical preparations as well as serving as the primary ingredient in alcoholic beverages. [NIH]

**Evaluation Studies:** Studies determining the effectiveness or value of processes, personnel, and equipment, or the material on conducting such studies. For drugs and devices, clinical trials, drug evaluation, and drug evaluation, preclinical are available. [NIH]

**Excitation:** An act of irritation or stimulation or of responding to a stimulus; the addition of energy, as the excitation of a molecule by absorption of photons. [EU]

**Excitotoxicity:** Excessive exposure to glutamate or related compounds can kill brain neurons, presumably by overstimulating them. [NIH]

**Exogenous:** Developed or originating outside the organism, as exogenous disease. [EU]
**Exon:** The part of the DNA that encodes the information for the actual amino acid sequence of the protein. In many eucaryotic genes, the coding sequences consist of a series of exons alternating with intron sequences. [NIH]

**Expiration:** The act of breathing out, or expelling air from the lungs. [EU]

**Extracellular:** Outside a cell or cells. [EU]

**Extracellular Matrix:** A meshwork-like substance found within the extracellular space and in association with the basement membrane of the cell surface. It promotes cellular proliferation and provides a supporting structure to which cells or cell lysates in culture dishes adhere. [NIH]

**Extraction:** The process or act of pulling or drawing out. [EU]

**Family Planning:** Programs or services designed to assist the family in controlling reproduction by either improving or diminishing fertility. [NIH]

**Fat:** Total lipids including phospholipids. [NIH]

**Fatigue:** The state of weariness following a period of exertion, mental or physical, characterized by a decreased capacity for work and reduced efficiency to respond to stimuli. [NIH]

**Fatty acids:** A major component of fats that are used by the body for energy and tissue development. [NIH]

**Fertilization in Vitro:** Fertilization of an egg outside the body when the egg is normally fertilized in the body. [NIH]

**Fetal Alcohol Syndrome:** A disorder occurring in children born to alcoholic women who continue to drink heavily during pregnancy. Common abnormalities are growth deficiency (prenatal and postnatal), altered morphogenesis, mental deficiency, and characteristic facies - small eyes and flattened nasal bridge. Fine motor dysfunction and tremulousness are observed in the newborn. [NIH]

**Fetal Development:** Morphologic and physiologic growth and development of the mammalian embryo or fetus. [NIH]

**Fetus:** The developing offspring from 7 to 8 weeks after conception until birth. [NIH]

**Fibrillation:** A small, local, involuntary contraction of muscle, invisible under the skin, resulting from spontaneous activation of single muscle cells or muscle fibres. [EU]

**Fibroblasts:** Connective tissue cells which secrete an extracellular matrix rich in collagen and other macromolecules. [NIH]

**Fibrosis:** Any pathological condition where fibrous connective tissue invades any organ, usually as a consequence of inflammation or other injury. [NIH]

**Fissure:** Any cleft or groove, normal or otherwise; especially a deep fold in the cerebral cortex which involves the entire thickness of the brain wall. [EU]

**Flatus:** Gas passed through the rectum. [NIH]

**Fluorescence:** The property of emitting radiation while being irradiated. The radiation emitted is usually of longer wavelength than that incident or absorbed, e.g., a substance can be irradiated with invisible radiation and emit visible light. X-ray fluorescence is used in diagnosis. [NIH]

**Fluorescence Polarization:** Measurement of the polarization of fluorescent light from solutions or microscopic specimens. It is used to provide information concerning molecular size, shape, and conformation, molecular anisotropy, electronic energy transfer, molecular interaction, including dye and coenzyme binding, and the antigen-antibody reaction. [NIH]
**Fluorescence Polarization Immunoassay:** Fluoroimmunoassay where detection of the hapten-antibody reaction is based on measurement of the increased polarization of fluorescence-labeled hapten when it is combined with antibody. The assay is very useful for the measurement of small haptenic antigens such as drugs at low concentrations. [NIH]

**Flushing:** A transient reddening of the face that may be due to fever, certain drugs, exertion, stress, or a disease process. [NIH]

**Forearm:** The part between the elbow and the wrist. [NIH]

**Frontal Lobe:** The anterior part of the cerebral hemisphere. [NIH]

**Functional magnetic resonance imaging:** A noninvasive tool used to observe functioning in the brain or other organs by detecting changes in chemical composition, blood flow, or both. [NIH]

**Fungi:** A kingdom of eukaryotic, heterotrophic organisms that live as saprobes or parasites, including mushrooms, yeasts, smuts, molds, etc. They reproduce either sexually or asexually, and have life cycles that range from simple to complex. Filamentous fungi refer to those that grow as multicellular colonies (mushrooms and molds). [NIH]

**Gallbladder:** The pear-shaped organ that sits below the liver. Bile is concentrated and stored in the gallbladder. [NIH]

**Ganglia:** Clusters of multipolar neurons surrounded by a capsule of loosely organized connective tissue located outside the central nervous system. [NIH]

**Gas:** Air that comes from normal breakdown of food. The gases are passed out of the body through the rectum (flatus) or the mouth (burp). [NIH]

**Gas exchange:** Primary function of the lungs; transfer of oxygen from inhaled air into the blood and of carbon dioxide from the blood into the lungs. [NIH]

**Gastrin:** A hormone released after eating. Gastrin causes the stomach to produce more acid. [NIH]

**Gastrointestinal tract:** The stomach and intestines. [NIH]

**Gene:** The functional and physical unit of heredity passed from parent to offspring. Genes are pieces of DNA, and most genes contain the information for making a specific protein. [NIH]

**Genotype:** The genetic constitution of the individual; the characterization of the genes. [NIH]

**Gestation:** The period of development of the young in viviparous animals, from the time of fertilization of the ovum until birth. [EU]

**Gland:** An organ that produces and releases one or more substances for use in the body. Some glands produce fluids that affect tissues or organs. Others produce hormones or participate in blood production. [NIH]

**Glucose:** D-Glucose. A primary source of energy for living organisms. It is naturally occurring and is found in fruits and other parts of plants in its free state. It is used therapeutically in fluid and nutrient replacement. [NIH]

**Glutamate:** Excitatory neurotransmitter of the brain. [NIH]

**Glutamic Acid:** A non-essential amino acid naturally occurring in the L-form. Glutamic acid (glutamate) is the most common excitatory neurotransmitter in the central nervous system. [NIH]

**Glycine:** A non-essential amino acid. It is found primarily in gelatin and silk fibroin and used therapeutically as a nutrient. It is also a fast inhibitory neurotransmitter. [NIH]

**Glycoside:** Any compound that contains a carbohydrate molecule (sugar), particularly any such natural product in plants, convertible, by hydrolytic cleavage, into sugar and a
nonsugar component (aglycone), and named specifically for the sugar contained, as glucoside (glucose), pentoside (pentose), fructoside (fructose) etc. [EU]

**Governing Board:** The group in which legal authority is vested for the control of health-related institutions and organizations. [NIH]

**Gravidity:** Pregnancy; the condition of being pregnant, without regard to the outcome. [EU]

**Growth:** The progressive development of a living being or part of an organism from its earliest stage to maturity. [NIH]

**Gynaecomastia:** Excessive development of the male mammary glands, even to the functional state. [EU]

**Habitual:** Of the nature of a habit; according to habit; established by or repeated by force of habit, customary. [EU]

**Hallucinogens:** Drugs capable of inducing illusions, hallucinations, delusions, paranoid ideations, and other alterations of mood and thinking. Despite the name, the feature that distinguishes these agents from other classes of drugs is their capacity to induce states of altered perception, thought, and feeling that are not experienced otherwise. [NIH]

**Haloperidol:** Butyrophenone derivative. [NIH]

**Haploid:** An organism with one basic chromosome set, symbolized by n; the normal condition of gametes in diploids. [NIH]

**Haptens:** Small antigenic determinants capable of eliciting an immune response only when coupled to a carrier. Haptens bind to antibodies but by themselves cannot elicit an antibody response. [NIH]

**Headache:** Pain in the cranial region that may occur as an isolated and benign symptom or as a manifestation of a wide variety of conditions including subarachnoid hemorrhage; craniocephalic trauma; central nervous system infections; intracranial hypertension; and other disorders. In general, recurrent headaches that are not associated with a primary disease process are referred to as headache disorders (e.g., migraine). [NIH]

**Headache Disorders:** Common conditions characterized by persistent or recurrent headaches. Headache syndrome classification systems may be based on etiology (e.g., vascular headache, post-traumatic headaches, etc.), temporal pattern (e.g., cluster headache, paroxysmal hemicrania, etc.), and precipitating factors (e.g., cough headache). [NIH]

**Health Status:** The level of health of the individual, group, or population as subjectively assessed by the individual or by more objective measures. [NIH]

**Heartbeat:** One complete contraction of the heart. [NIH]

**Hemorrhage:** Bleeding or escape of blood from a vessel. [NIH]

**Hemostasis:** The process which spontaneously arrests the flow of blood from vessels carrying blood under pressure. It is accomplished by contraction of the vessels, adhesion and aggregation of formed blood elements, and the process of blood or plasma coagulation. [NIH]

**Hepatitis:** Inflammation of the liver and liver disease involving degenerative or necrotic alterations of hepatocytes. [NIH]

**Hepatocytes:** The main structural component of the liver. They are specialized epithelial cells that are organized into interconnected plates called lobules. [NIH]

**Hepatotoxicity:** How much damage a medicine or other substance does to the liver. [NIH]

**Hereditary:** Of, relating to, or denoting factors that can be transmitted genetically from one generation to another. [NIH]
**Heredity:** 1. The genetic transmission of a particular quality or trait from parent to offspring. 2. The genetic constitution of an individual. [EU]

**Herpes:** Any inflammatory skin disease caused by a herpesvirus and characterized by the formation of clusters of small vesicles. When used alone, the term may refer to herpes simplex or to herpes zoster. [EU]

**Herpes virus:** A member of the herpes family of viruses. [NIH]

**Hiccups:** A spasm of the diaphragm that causes a sudden inhalation followed by rapid closure of the glottis which produces a sound. [NIH]

**Hippocampus:** A curved elevation of gray matter extending the entire length of the floor of the temporal horn of the lateral ventricle (Dorland, 28th ed). The hippocampus, subiculum, and dentate gyrus constitute the hippocampal formation. Sometimes authors include the entorhinal cortex in the hippocampal formation. [NIH]

**Histamine:** 1H-Imidazole-4-ethanamine. A depressor amine derived by enzymatic decarboxylation of histidine. It is a powerful stimulant of gastric secretion, a constrictor of bronchial smooth muscle, a vasodilator, and also a centrally acting neurotransmitter. [NIH]

**Hormonal:** Pertaining to or of the nature of a hormone. [EU]

**Hormone:** A substance in the body that regulates certain organs. Hormones such as gastrin help in breaking down food. Some hormones come from cells in the stomach and small intestine. [NIH]

**Human Rights:** The rights of the individual to cultural, social, economic, and educational opportunities as provided by society, e.g., right to work, right to education, and right to social security. [NIH]

**Hydrogen:** The first chemical element in the periodic table. It has the atomic symbol H, atomic number 1, and atomic weight 1. It exists, under normal conditions, as a colorless, odorless, tasteless, diatomic gas. Hydrogen ions are protons. Besides the common H1 isotope, hydrogen exists as the stable isotope deuterium and the unstable, radioactive isotope tritium. [NIH]

**Hydrogenation:** Specific method of reduction in which hydrogen is added to a substance by the direct use of gaseous hydrogen. [NIH]

**Hydrolysis:** The process of cleaving a chemical compound by the addition of a molecule of water. [NIH]

**Hydroxylysine:** A hydroxylated derivative of the amino acid lysine that is present in certain collagens. [NIH]

**Hydroxyproline:** A hydroxylated form of the imino acid proline. A deficiency in ascorbic acid can result in impaired hydroxyproline formation. [NIH]

**Hypersensitivity:** Altered reactivity to an antigen, which can result in pathologic reactions upon subsequent exposure to that particular antigen. [NIH]

**Hypersensitivity, Immediate:** Hypersensitivity reactions which occur within minutes of exposure to challenging antigen due to the release of histamine which follows the antigen-antibody reaction and causes smooth muscle contraction and increased vascular permeability. [NIH]

**Hypertension:** Persistently high arterial blood pressure. Currently accepted threshold levels are 140 mm Hg systolic and 90 mm Hg diastolic pressure. [NIH]

**Hypotension:** Abnormally low blood pressure. [NIH]

**Hypothalamus:** Ventral part of the diencephalon extending from the region of the optic
chiasm to the caudal border of the mamillary bodies and forming the inferior and lateral walls of the third ventricle. [NIH]

Id: The part of the personality structure which harbors the unconscious instinctive desires and strivings of the individual. [NIH]

Illusions: The misinterpretation of a real external, sensory experience. [NIH]

Imipramine: The prototypical tricyclic antidepressant. It has been used in major depression, dysthymia, bipolar depression, attention-deficit disorders, agoraphobia, and panic disorders. It has less sedative effect than some other members of this therapeutic group. [NIH]

Immune response: The activity of the immune system against foreign substances (antigens). [NIH]

Immune system: The organs, cells, and molecules responsible for the recognition and disposal of foreign (“non-self”) material which enters the body. [NIH]

Immunoassay: Immunochemical assay or detection of a substance by serologic or immunologic methods. Usually the substance being studied serves as antigen both in antibody production and in measurement of antibody by the test substance. [NIH]

Immunogenic: Producing immunity; evoking an immune response. [EU]

Immunoglobulin: A protein that acts as an antibody. [NIH]

Immunologic: The ability of the antibody-forming system to recall a previous experience with an antigen and to respond to a second exposure with the prompt production of large amounts of antibody. [NIH]

Immunology: The study of the body’s immune system. [NIH]

Impairment: In the context of health experience, an impairment is any loss or abnormality of psychological, physiological, or anatomical structure or function. [NIH]

In vivo: In the body. The opposite of in vitro (outside the body or in the laboratory). [NIH]

Indicative: That indicates; that points out more or less exactly; that reveals fairly clearly. [EU]

Induction: The act or process of inducing or causing to occur, especially the production of a specific morphogenetic effect in the developing embryo through the influence of evocators or organizers, or the production of anaesthesia or unconsciousness by use of appropriate agents. [EU]

Infancy: The period of complete dependency prior to the acquisition of competence in walking, talking, and self-feeding. [NIH]

Inflammation: A pathological process characterized by injury or destruction of tissues caused by a variety of cytologic and chemical reactions. It is usually manifested by typical signs of pain, heat, redness, swelling, and loss of function. [NIH]

Ingestion: Taking into the body by mouth [NIH]

Inhalation: The drawing of air or other substances into the lungs. [EU]

Initiation: Mutation induced by a chemical reactive substance causing cell changes; being a step in a carcinogenic process. [NIH]

Inorganic: Pertaining to substances not of organic origin. [EU]

Inotropic: Affecting the force or energy of muscular contractions. [EU]

Inpatients: Persons admitted to health facilities which provide board and room, for the purpose of observation, care, diagnosis or treatment. [NIH]

Insulator: Material covering the metal conductor of the lead. It is usually polyurethane or
Silicone. [NIH]

**Interferon:** A biological response modifier (a substance that can improve the body's natural response to disease). Interferons interfere with the division of cancer cells and can slow tumor growth. There are several types of interferons, including interferon-alpha, -beta, and -gamma. These substances are normally produced by the body. They are also made in the laboratory for use in treating cancer and other diseases. [NIH]

**Interferon-alpha:** One of the type I interferons produced by peripheral blood leukocytes or lymphoblastoid cells when exposed to live or inactivated virus, double-stranded RNA, or bacterial products. It is the major interferon produced by virus-induced leukocyte cultures and, in addition to its pronounced antiviral activity, it causes activation of NK cells. [NIH]

**Intoxication:** Poisoning, the state of being poisoned. [EU]

**Intracellular:** Inside a cell. [NIH]

**Intravenous:** IV. Into a vein. [NIH]

**Involuntary:** Reaction occurring without intention or volition. [NIH]

**Ischemia:** Deficiency of blood in a part, due to functional constriction or actual obstruction of a blood vessel. [EU]

**Ischemic stroke:** A condition in which the blood supply to part of the brain is cut off. Also called "plug-type" strokes. Blocked arteries starve areas of the brain controlling sight, speech, sensation, and movement so that these functions are partially or completely lost. Ischemic stroke is the most common type of stroke, accounting for 80 percent of all strokes. Most ischemic strokes are caused by a blood clot called a thrombus, which blocks blood flow in the arteries feeding the brain, usually the carotid artery in the neck, the major vessel bringing blood to the brain. When it becomes blocked, the risk of stroke is very high. [NIH]

**Kb:** A measure of the length of DNA fragments, 1 Kb = 1000 base pairs. The largest DNA fragments are up to 50 kilobases long. [NIH]

**Ketamine:** A cyclohexanone derivative used for induction of anesthesia. Its mechanism of action is not well understood, but ketamine can block NMDA receptors (receptors, N-Methyl-D-Aspartate) and may interact with sigma receptors. [NIH]

**Kinetic:** Pertaining to or producing motion. [EU]

**Lactation:** The period of the secretion of milk. [EU]

**Large Intestine:** The part of the intestine that goes from the cecum to the rectum. The large intestine absorbs water from stool and changes it from a liquid to a solid form. The large intestine is 5 feet long and includes the appendix, cecum, colon, and rectum. Also called colon. [NIH]

**Lectin:** A complex molecule that has both protein and sugars. Lectins are able to bind to the outside of a cell and cause biochemical changes in it. Lectins are made by both animals and plants. [NIH]

**Lesion:** An area of abnormal tissue change. [NIH]

**Lethal:** Deadly, fatal. [EU]

**Leukotrienes:** A family of biologically active compounds derived from arachidonic acid by oxidative metabolism through the 5-lipoxygenase pathway. They participate in host defense reactions and pathophysiological conditions such as immediate hypersensitivity and inflammation. They have potent actions on many essential organs and systems, including the cardiovascular, pulmonary, and central nervous system as well as the gastrointestinal tract and the immune system. [NIH]

**Library Services:** Services offered to the library user. They include reference and
circulation. [NIH]

**Ligament:** A band of fibrous tissue that connects bones or cartilages, serving to support and strengthen joints. [EU]

**Limbic:** Pertaining to a limbus, or margin; forming a border around. [EU]

**Limbic System:** A set of forebrain structures common to all mammals that is defined functionally and anatomically. It is implicated in the higher integration of visceral, olfactory, and somatic information as well as homeostatic responses including fundamental survival behaviors (feeding, mating, emotion). For most authors, it includes the amygdala, epithalamus, gyrus cinguli, hippocampal formation (see hippocampus), hypothalamus, parahippocampal gyrus, septal nuclei, anterior nuclear group of thalamus, and portions of the basal ganglia. (Parent, Carpenter's Human Neuroanatomy, 9th ed, p744; NeuroNames, http://rprcsrgi.rprc.washington.edu/neuronames/index.html (September 2, 1998)). [NIH]

**Lipid:** Fat. [NIH]

**Lithium:** An element in the alkali metals family. It has the atomic symbol Li, atomic number 3, and atomic weight 6.94. Salts of lithium are used in treating manic-depressive disorders. [NIH]

**Liver:** A large, glandular organ located in the upper abdomen. The liver cleanses the blood and aids in digestion by secreting bile. [NIH]

**Lobe:** A portion of an organ such as the liver, lung, breast, or brain. [NIH]

**Localized:** Cancer which has not metastasized yet. [NIH]

**Locomotor:** Of or pertaining to locomotion; pertaining to or affecting the locomotive apparatus of the body. [EU]

**Longitudinal Studies:** Studies in which variables relating to an individual or group of individuals are assessed over a period of time. [NIH]

**Longitudinal study:** Also referred to as a "cohort study" or "prospective study"; the analytic method of epidemiologic study in which subsets of a defined population can be identified who are, have been, or in the future may be exposed or not exposed, or exposed in different degrees, to a factor or factors hypothesized to influence the probability of occurrence of a given disease or other outcome. The main feature of this type of study is to observe large numbers of subjects over an extended time, with comparisons of incidence rates in groups that differ in exposure levels. [NIH]

**Lubricants:** Oily or slippery substances. [NIH]

**Lutein Cells:** The cells of the corpus luteum which are derived from the granulosa cells and the theca cells of the Graafian follicle. [NIH]

**Lymphocytes:** White blood cells formed in the body's lymphoid tissue. The nucleus is round or ovoid with coarse, irregularly clumped chromatin while the cytoplasm is typically pale blue with azurophilic (if any) granules. Most lymphocytes can be classified as either T or B (with subpopulations of each); those with characteristics of neither major class are called null cells. [NIH]

**Lymphoid:** Referring to lymphocytes, a type of white blood cell. Also refers to tissue in which lymphocytes develop. [NIH]

**Lymphoma:** A general term for various neoplastic diseases of the lymphoid tissue. [NIH]

**Magnetic Resonance Imaging:** Non-invasive method of demonstrating internal anatomy based on the principle that atomic nuclei in a strong magnetic field absorb pulses of radiofrequency energy and emit them as radiowaves which can be reconstructed into computerized images. The concept includes proton spin tomographic techniques. [NIH]
Malignant: Cancerous; a growth with a tendency to invade and destroy nearby tissue and spread to other parts of the body. [NIH]

Malnutrition: A condition caused by not eating enough food or not eating a balanced diet. [NIH]

Mammary: Pertaining to the mamma, or breast. [EU]

Manic: Affected with mania. [EU]

Manic-depressive psychosis: One of a group of psychotic reactions, fundamentally marked by severe mood swings and a tendency to remission and recurrence. [NIH]

Marijuana Smoking: Inhaling and exhaling the smoke from Cannabis. [NIH]

Medial: Lying near the midsagittal plane of the body; opposed to lateral. [NIH]

Mediate: Indirect; accomplished by the aid of an intervening medium. [EU]

Mediator: An object or substance by which something is mediated, such as (1) a structure of the nervous system that transmits impulses eliciting a specific response; (2) a chemical substance (transmitter substance) that induces activity in an excitable tissue, such as nerve or muscle; or (3) a substance released from cells as the result of the interaction of antigen with antibody or by the action of antigen with a sensitized lymphocyte. [EU]

Medical Records: Recording of pertinent information concerning patient's illness or illnesses. [NIH]

Medicament: A medicinal substance or agent. [EU]

MEDLINE: An online database of MEDLARS, the computerized bibliographic Medical Literature Analysis and Retrieval System of the National Library of Medicine. [NIH]

Membranes: Thin layers of tissue which cover parts of the body, separate adjacent cavities, or connect adjacent structures. [NIH]

Memory: Complex mental function having four distinct phases: (1) memorizing or learning, (2) retention, (3) recall, and (4) recognition. Clinically, it is usually subdivided into immediate, recent, and remote memory. [NIH]

Meninges: The three membranes that cover and protect the brain and spinal cord. [NIH]

Mental: Pertaining to the mind; psychic. 2. (L. mentum chin) pertaining to the chin. [EU]

Mental deficiency: A condition of arrested or incomplete development of mind from inherent causes or induced by disease or injury. [NIH]

Mental Disorders: Psychiatric illness or diseases manifested by breakdowns in the adaptational process expressed primarily as abnormalities of thought, feeling, and behavior producing either distress or impairment of function. [NIH]

Mental Health: The state wherein the person is well adjusted. [NIH]

Mental Processes: Conceptual functions or thinking in all its forms. [NIH]

Mesolimbic: Inner brain region governing emotion and drives. [NIH]

Meta-Analysis: A quantitative method of combining the results of independent studies (usually drawn from the published literature) and synthesizing summaries and conclusions which may be used to evaluate therapeutic effectiveness, plan new studies, etc., with application chiefly in the areas of research and medicine. [NIH]

Metabolite: Any substance produced by metabolism or by a metabolic process. [EU]

Methanol: A colorless, flammable liquid used in the manufacture of formaldehyde and acetic acid, in chemical synthesis, antifreeze, and as a solvent. Ingestion of methanol is toxic and may cause blindness. [NIH]
**MI**: Myocardial infarction. Gross necrosis of the myocardium as a result of interruption of the blood supply to the area; it is almost always caused by atherosclerosis of the coronary arteries, upon which coronary thrombosis is usually superimposed. [NIH]

**Microbe**: An organism which cannot be observed with the naked eye; e.g. unicellular animals, lower algae, lower fungi, bacteria. [NIH]

**Microbiology**: The study of microorganisms such as fungi, bacteria, algae, archaea, and viruses. [NIH]

**Microglia**: The third type of glial cell, along with astrocytes and oligodendrocytes (which together form the macroglia). Microglia vary in appearance depending on developmental stage, functional state, and anatomical location; subtype terms include ramified, perivascular, ameboid, resting, and activated. Microglia clearly are capable of phagocytosis and play an important role in a wide spectrum of neuropathologies. They have also been suggested to act in several other roles including in secretion (e.g., of cytokines and neural growth factors), in immunological processing (e.g., antigen presentation), and in central nervous system development and remodeling. [NIH]

**Microorganism**: An organism that can be seen only through a microscope. Microorganisms include bacteria, protozoa, algae, and fungi. Although viruses are not considered living organisms, they are sometimes classified as microorganisms. [NIH]

**Mode of Transmission**: Hepatitis A [NIH]

**Modification**: A change in an organism, or in a process in an organism, that is acquired from its own activity or environment. [NIH]

**Molecular**: Of, pertaining to, or composed of molecules: a very small mass of matter. [EU]

**Molecule**: A chemical made up of two or more atoms. The atoms in a molecule can be the same (an oxygen molecule has two oxygen atoms) or different (a water molecule has two hydrogen atoms and one oxygen atom). Biological molecules, such as proteins and DNA, can be made up of many thousands of atoms. [NIH]

**Monoamine**: Enzyme that breaks down dopamine in the astrocytes and microglia. [NIH]

**Monoamine Oxidase**: An enzyme that catalyzes the oxidative deamination of naturally occurring monoamines. It is a flavin-containing enzyme that is localized in mitochondrial membranes, whether in nerve terminals, the liver, or other organs. Monoamine oxidase is important in regulating the metabolic degradation of catecholamines and serotonin in neural or target tissues. Hepatic monoamine oxidase has a crucial defensive role in inactivating circulating monoamines or those, such as tyramine, that originate in the gut and are absorbed into the portal circulation. (From Goodman and Gilman's, The Pharmacological Basis of Therapeutics, 8th ed, p415) EC 1.4.3.4. [NIH]

**Morphine**: The principal alkaloid in opium and the prototype opiate analgesic and narcotic. Morphine has widespread effects in the central nervous system and on smooth muscle. [NIH]

**Morphogenesis**: The development of the form of an organ, part of the body, or organism. [NIH]

**Motility**: The ability to move spontaneously. [EU]

**Motion Sickness**: Sickness caused by motion, as sea sickness, train sickness, car sickness, and air sickness. [NIH]

**Movement Disorders**: Syndromes which feature dyskinesias as a cardinal manifestation of the disease process. Included in this category are degenerative, hereditary, post-infectious, medication-induced, post-inflammatory, and post-traumatic conditions. [NIH]

**Mucins**: A secretion containing mucopolysaccharides and protein that is the chief constituent of mucus. [NIH]
**Mucosa:** A mucous membrane, or tunica mucosa. [EU]

**Multiple sclerosis:** A disorder of the central nervous system marked by weakness, numbness, a loss of muscle coordination, and problems with vision, speech, and bladder control. Multiple sclerosis is thought to be an autoimmune disease in which the body's immune system destroys myelin. Myelin is a substance that contains both protein and fat (lipid) and serves as a nerve insulator and helps in the transmission of nerve signals. [NIH]

**Muscle Spasticity:** Strongly marked hypertonicity of muscles. [NIH]

**Mutagenic:** Inducing genetic mutation. [EU]

**Myelin:** The fatty substance that covers and protects nerves. [NIH]

**Myocardium:** The muscle tissue of the heart composed of striated, involuntary muscle known as cardiac muscle. [NIH]

**Naive:** Used to describe an individual who has never taken a certain drug or class of drugs (e.g., AZT-naive, antiretroviral-naive), or to refer to an undifferentiated immune system cell. [NIH]

**Narcotic:** 1. Pertaining to or producing narcosis. 2. An agent that produces insensibility or stupor, applied especially to the opioids, i.e. to any natural or synthetic drug that has morphine-like actions. [EU]

**Nausea:** An unpleasant sensation in the stomach usually accompanied by the urge to vomit. Common causes are early pregnancy, sea and motion sickness, emotional stress, intense pain, food poisoning, and various enteroviruses. [NIH]

**NCI:** National Cancer Institute. NCI, part of the National Institutes of Health of the United States Department of Health and Human Services, is the federal government's principal agency for cancer research. NCI conducts, coordinates, and funds cancer research, training, health information dissemination, and other programs with respect to the cause, diagnosis, prevention, and treatment of cancer. Access the NCI Web site at http://cancer.gov. [NIH]

**Necrosis:** A pathological process caused by the progressive degradative action of enzymes that is generally associated with severe cellular trauma. It is characterized by mitochondrial swelling, nuclear flocculation, uncontrolled cell lysis, and ultimately cell death. [NIH]

**Need:** A state of tension or dissatisfaction felt by an individual that impels him to action toward a goal he believes will satisfy the impulse. [NIH]

**Neonatal:** Pertaining to the first four weeks after birth. [EU]

**Neoplastic:** Pertaining to or like a neoplasm (= any new and abnormal growth); pertaining to neoplasia (= the formation of a neoplasm). [EU]

**Nerve:** A cordlike structure of nervous tissue that connects parts of the nervous system with other tissues of the body and conveys nervous impulses to, or away from, these tissues. [NIH]

**Nervous System:** The entire nerve apparatus composed of the brain, spinal cord, nerves and ganglia. [NIH]

**Neural:** 1. Pertaining to a nerve or to the nerves. 2. Situated in the region of the spinal axis, as the neutral arch. [EU]

**Neurogenic:** Loss of bladder control caused by damage to the nerves controlling the bladder. [NIH]

**Neuroleptic:** A term coined to refer to the effects on cognition and behaviour of antipsychotic drugs, which produce a state of apathy, lack of initiative, and limited range of emotion and in psychotic patients cause a reduction in confusion and agitation and normalization of psychomotor activity. [EU]
Neuromuscular: Pertaining to muscles and nerves. [EU]

Neuromuscular Junction: The synapse between a neuron and a muscle. [NIH]

Neurons: The basic cellular units of nervous tissue. Each neuron consists of a body, an axon, and dendrites. Their purpose is to receive, conduct, and transmit impulses in the nervous system. [NIH]

Neuropathy: A problem in any part of the nervous system except the brain and spinal cord. Neuropathies can be caused by infection, toxic substances, or disease. [NIH]

Neurotransmitter: Any of a group of substances that are released on excitation from the axon terminal of a presynaptic neuron of the central or peripheral nervous system and travel across the synaptic cleft to either excite or inhibit the target cell. Among the many substances that have the properties of a neurotransmitter are acetylcholine, norepinephrine, epinephrine, dopamine, glycine, y-aminobutyrate, glutamic acid, substance P, enkephalins, endorphins, and serotonin. [EU]

Nicotine: Nicotine is a highly toxic alkaloid. It is the prototypical agonist at nicotinic cholinergic receptors where it dramatically stimulates neurons and ultimately blocks synaptic transmission. Nicotine is also important medically because of its presence in tobacco smoke. [NIH]

Nitrogen: An element with the atomic symbol N, atomic number 7, and atomic weight 14. Nitrogen exists as a diatomic gas and makes up about 78% of the earth's atmosphere by volume. It is a constituent of proteins and nucleic acids and found in all living cells. [NIH]

Nitrous Oxide: Nitrogen oxide (N2O). A colorless, odorless gas that is used as an anesthetic and analgesic. High concentrations cause a narcotic effect and may replace oxygen, causing death by asphyxia. It is also used as a food aerosol in the preparation of whipping cream. [NIH]

Norepinephrine: Precursor of epinephrine that is secreted by the adrenal medulla and is a widespread central and autonomic neurotransmitter. Norepinephrine is the principal transmitter of most postganglionic sympathetic fibers and of the diffuse projection system in the brain arising from the locus ceruleus. It is also found in plants and is used pharmacologically as a sympathomimetic. [NIH]

Nuclear: A test of the structure, blood flow, and function of the kidneys. The doctor injects a mildly radioactive solution into an arm vein and uses x-rays to monitor its progress through the kidneys. [NIH]

Nucleus: A body of specialized protoplasm found in nearly all cells and containing the chromosomes. [NIH]

Nystagmus: An involuntary, rapid, rhythmic movement of the eyeball, which may be horizontal, vertical, rotatory, or mixed, i.e., of two varieties. [EU]

Opiate: A remedy containing or derived from opium; also any drug that induces sleep. [EU]

Opium: The air-dried exudate from the unripe seed capsule of the opium poppy, Papaver somniferum, or its variant, P. album. It contains a number of alkaloids, but only a few - morphine, codeine, and papaverine - have clinical significance. Opium has been used as an analgesic, antitussive, antidiarrheal, and antispasmodic. [NIH]

Orthostatic: Pertaining to or caused by standing erect. [EU]

Ouabain: A cardioactive glycoside consisting of rhamnose and ouabagenin, obtained from the seeds of Strophanthus gratus and other plants of the Apocynaceae; used like digitalis. It is commonly used in cell biological studies as an inhibitor of the NA(+)−K(+)−exchanging ATPase. [NIH]

Outpatient: A patient who is not an inmate of a hospital but receives diagnosis or treatment
in a clinic or dispensary connected with the hospital. [NIH]

**Ovary:** Either of the paired glands in the female that produce the female germ cells and secrete some of the female sex hormones. [NIH]

**Ovum:** A female germ cell extruded from the ovary at ovulation. [NIH]

**Oxygen Consumption:** The oxygen consumption is determined by calculating the difference between the amount of oxygen inhaled and exhaled. [NIH]

**Palliative:** 1. Affording relief, but not cure. 2. An alleviating medicine. [EU]

**Pancreas:** A mixed exocrine and endocrine gland situated transversely across the posterior abdominal wall in the epigastric and hypochondriac regions. The endocrine portion is comprised of the Islets of Langerhans, while the exocrine portion is a compound acinar gland that secretes digestive enzymes. [NIH]

**Panic:** A state of extreme acute, intense anxiety and unreasoning fear accompanied by disorganization of personality function. [NIH]

**Panic Disorder:** A type of anxiety disorder characterized by unexpected panic attacks that last minutes or, rarely, hours. Panic attacks begin with intense apprehension, fear or terror and, often, a feeling of impending doom. Symptoms experienced during a panic attack include dyspnea or sensations of being smothered; dizziness, loss of balance or faintness; choking sensations; palpitations or accelerated heart rate; shakiness; sweating; nausea or other form of abdominal distress; depersonalization or derealization; paresthesias; hot flashes or chills; chest discomfort or pain; fear of dying and fear of not being in control of oneself or going crazy. Agoraphobia may also develop. Similar to other anxiety disorders, it may be inherited as an autosomal dominant trait. [NIH]

**Paresthesias:** Abnormal touch sensations, such as burning or prickling, that occur without an outside stimulus. [NIH]

**Parity:** The number of offspring a female has borne. It is contrasted with gravidity, which refers to the number of pregnancies, regardless of outcome. [NIH]

**Parkinsonism:** A group of neurological disorders characterized by hypokinesia, tremor, and muscular rigidity. [EU]

**Parturition:** The act or process of given birth to a child. [EU]

**Pathologic:** 1. Indicative of or caused by a morbid condition. 2. Pertaining to pathology (= branch of medicine that treats the essential nature of the disease, especially the structural and functional changes in tissues and organs of the body caused by the disease). [EU]

**Pathophysiology:** Altered functions in an individual or an organ due to disease. [NIH]

**Patient Education:** The teaching or training of patients concerning their own health needs. [NIH]

**Pelvic:** Pertaining to the pelvis. [EU]

**Perception:** The ability quickly and accurately to recognize similarities and differences among presented objects, whether these be pairs of words, pairs of number series, or multiple sets of these or other symbols such as geometric figures. [NIH]

**Perinatal:** Pertaining to or occurring in the period shortly before and after birth; variously defined as beginning with completion of the twentieth to twenty-eighth week of gestation and ending 7 to 28 days after birth. [EU]

**Peripheral Nervous System:** The nervous system outside of the brain and spinal cord. The peripheral nervous system has autonomic and somatic divisions. The autonomic nervous system includes the enteric, parasympathetic, and sympathetic subdivisions. The somatic nervous system includes the cranial and spinal nerves and their ganglia and the peripheral
sensory receptors. [NIH]

**Peripheral Neuropathy:** Nerve damage, usually affecting the feet and legs; causing pain, numbness, or a tingling feeling. Also called "somatic neuropathy" or "distal sensory polyneuropathy." [NIH]

**Peroral:** Performed through or administered through the mouth. [EU]

**Petroleum:** Naturally occurring complex liquid hydrocarbons which, after distillation, yield combustible fuels, petrochemicals, and lubricants. [NIH]

**Pharmacokinetic:** The mathematical analysis of the time courses of absorption, distribution, and elimination of drugs. [NIH]

**Pharmacologic:** Pertaining to pharmacology or to the properties and reactions of drugs. [EU]

**Phenotypes:** An organism as observed, i.e. as judged by its visually perceptible characters resulting from the interaction of its genotype with the environment. [NIH]

**Physical Examination:** Systematic and thorough inspection of the patient for physical signs of disease or abnormality. [NIH]

**Physiologic:** Having to do with the functions of the body. When used in the phrase "physiologic age," it refers to an age assigned by general health, as opposed to calendar age. [NIH]

**Physiology:** The science that deals with the life processes and functions of organismus, their cells, tissues, and organs. [NIH]

**Pilot study:** The initial study examining a new method or treatment. [NIH]

**Plants:** Multicellular, eukaryotic life forms of the kingdom Plantae. They are characterized by a mainly photosynthetic mode of nutrition; essentially unlimited growth at localized regions of cell divisions (meristems); cellulose within cells providing rigidity; the absence of organs of locomotion; absence of nervous and sensory systems; and an alteration of haploid and diploid generations. [NIH]

**Plasma:** The clear, yellowish, fluid part of the blood that carries the blood cells. The proteins that form blood clots are in plasma. [NIH]

**Platelet Aggregation:** The attachment of platelets to one another. This clumping together can be induced by a number of agents (e.g., thrombin, collagen) and is part of the mechanism leading to the formation of a thrombus. [NIH]

**Platelets:** A type of blood cell that helps prevent bleeding by causing blood clots to form. Also called thrombocytes. [NIH]

**Platinum:** Platinum. A heavy, soft, whitish metal, resembling tin, atomic number 78, atomic weight 195.09, symbol Pt. (From Dorland, 28th ed) It is used in manufacturing equipment for laboratory and industrial use. It occurs as a black powder (platinum black) and as a spongy substance (spongy platinum) and may have been known in Pliny’s time as "alutiae". [NIH]

**Pneumonia:** Inflammation of the lungs. [NIH]

**Poisoning:** A condition or physical state produced by the ingestion, injection or inhalation of, or exposure to a deleterious agent. [NIH]

**Pollen:** The male fertilizing element of flowering plants analogous to sperm in animals. It is released from the anthers as yellow dust, to be carried by insect or other vectors, including wind, to the ovary (stigma) of other flowers to produce the embryo enclosed by the seed. The pollens of many plants are allergenic. [NIH]

**Polypeptide:** A peptide which on hydrolysis yields more than two amino acids; called tripeptides, tetrapeptides, etc. according to the number of amino acids contained. [EU]
**Posterior:** Situated in back of, or in the back part of, or affecting the back or dorsal surface of the body. In lower animals, it refers to the caudal end of the body. [EU]

**Post-traumatic:** Occurring as a result of or after injury. [EU]

**Practicability:** A non-standard characteristic of an analytical procedure. It is dependent on the scope of the method and is determined by requirements such as sample throughout and costs. [NIH]

**Practice Guidelines:** Directions or principles presenting current or future rules of policy for the health care practitioner to assist him in patient care decisions regarding diagnosis, therapy, or related clinical circumstances. The guidelines may be developed by government agencies at any level, institutions, professional societies, governing boards, or by the convening of expert panels. The guidelines form a basis for the evaluation of all aspects of health care and delivery. [NIH]

**Precursor:** Something that precedes. In biological processes, a substance from which another, usually more active or mature substance is formed. In clinical medicine, a sign or symptom that heralds another. [EU]

**Prefrontal Cortex:** The rostral part of the frontal lobe, bounded by the inferior precentral fissure in humans, which receives projection fibers from the mediodorsal nucleus of the thalamus. The prefrontal cortex receives afferent fibers from numerous structures of the diencephalon, mesencephalon, and limbic system as well as cortical afferents of visual, auditory, and somatic origin. [NIH]

**Pregnancy Outcome:** Results of conception and ensuing pregnancy, including live birth, stillbirth, spontaneous abortion, induced abortion. The outcome may follow natural or artificial insemination or any of the various reproduction techniques, such as embryo transfer or fertilization in vitro. [NIH]

**Prenatal:** Existing or occurring before birth, with reference to the fetus. [EU]

**Presynaptic:** Situated proximal to a synapse, or occurring before the synapse is crossed. [EU]

**Prevalence:** The total number of cases of a given disease in a specified population at a designated time. It is differentiated from incidence, which refers to the number of new cases in the population at a given time. [NIH]

**Progesterone:** Preg-4-ene-3,20-dione. The principal progestational hormone of the body, secreted by the corpus luteum, adrenal cortex, and placenta. Its chief function is to prepare the uterus for the reception and development of the fertilized ovum. It acts as an antiovulatory agent when administered on days 5-25 of the menstrual cycle. [NIH]

**Prognostic factor:** A situation or condition, or a characteristic of a patient, that can be used to estimate the chance of recovery from a disease, or the chance of the disease recurring (coming back). [NIH]

**Progression:** Increase in the size of a tumor or spread of cancer in the body. [NIH]

**Progressive:** Advancing; going forward; going from bad to worse; increasing in scope or severity. [EU]

**Projection:** A defense mechanism, operating unconsciously, whereby that which is emotionally unacceptable in the self is rejected and attributed (projected) to others. [NIH]

**Prolactin:** Pituitary lactogenic hormone. A polypeptide hormone with a molecular weight of about 23,000. It is essential in the induction of lactation in mammals at parturition and is synergistic with estrogen. The hormone also brings about the release of progesterone from lutein cells, which renders the uterine mucosa suited for the embedding of the ovum should fertilization occur. [NIH]
Prone: Having the front portion of the body downwards. [NIH]

Prospective study: An epidemiologic study in which a group of individuals (a cohort), all free of a particular disease and varying in their exposure to a possible risk factor, is followed over a specific amount of time to determine the incidence rates of the disease in the exposed and unexposed groups. [NIH]

Prostaglandin: Any of a group of components derived from unsaturated 20-carbon fatty acids, primarily arachidonic acid, via the cyclooxygenase pathway that are extremely potent mediators of a diverse group of physiologic processes. The abbreviation for prostaglandin is PG; specific compounds are designated by adding one of the letters A through I to indicate the type of substituents found on the hydrocarbon skeleton and a subscript (1, 2 or 3) to indicate the number of double bonds in the hydrocarbon skeleton e.g., PGE2. The predominant naturally occurring prostaglandins all have two double bonds and are synthesized from arachidonic acid (5,8,11,14-eicosatetraenoic acid) by the pathway shown in the illustration. The 1 series and 3 series are produced by the same pathway with fatty acids having one fewer double bond (8,11,14-eicosatrienoic acid or one more double bond (5,8,11,14,17-eicosapentaenoic acid) than arachidonic acid. The subscript α or β indicates the configuration at C-9 (α denotes a substituent below the plane of the ring, β, above the plane). The naturally occurring PGF's have the α configuration, e.g., PGF2α. All of the prostaglandins act by binding to specific cell-surface receptors causing an increase in the level of the intracellular second messenger cyclic AMP (and in some cases cyclic GMP also). The effect produced by the cyclic AMP increase depends on the specific cell type. In some cases there is also a positive feedback effect. Increased cyclic AMP increases prostaglandin synthesis leading to further increases in cyclic AMP. [EU]

Prostaglandins A: (13E,15S)-15-Hydroxy-9-oxoprosta-10,13-dien-1-oic acid (PGA(1)); (5Z,13E,15S)-15-hydroxy-9-oxoprosta-5,10,13-trien-1-oic acid (PGA(2)); (5Z,13E,15S,17Z)-15-hydroxy-9-oxoprosta-5,10,13,17-tetraen-1-oic acid (PGA(3)). A group of naturally occurring secondary prostaglandins derived from PGE. PGA(1) and PGA(2) as well as their 19-hydroxy derivatives are found in many organs and tissues. [NIH]

Prostaglandins B: Physiologically active prostaglandins found in many tissues and organs. They are potent pressor substances and have many other physiological activities. [NIH]

Prostate: A gland in males that surrounds the neck of the bladder and the urethra. It secretes a substance that liquefies coagulated semen. It is situated in the pelvic cavity behind the lower part of the pubic symphysis, above the deep layer of the triangular ligament, and rests upon the rectum. [NIH]

Protein S: The vitamin K-dependent cofactor of activated protein C. Together with protein C, it inhibits the action of factors VIIIa and Va. A deficiency in protein S can lead to recurrent venous and arterial thrombosis. [NIH]

Proteins: Polymers of amino acids linked by peptide bonds. The specific sequence of amino acids determines the shape and function of the protein. [NIH]

Protocol: The detailed plan for a clinical trial that states the trial's rationale, purpose, drug or vaccine dosages, length of study, routes of administration, who may participate, and other aspects of trial design. [NIH]

Protozoa: A subkingdom consisting of unicellular organisms that are the simplest in the animal kingdom. Most are free living. They range in size from submicroscopic to macroscopic. Protozoa are divided into seven phyla: Sarcomastigophora, Labyrinthomorpha, Apicomplexa, Microspora, Ascetospora, Myxozoa, and Ciliophora. [NIH]

Psychiatric: Pertaining to or within the purview of psychiatry. [EU]

Psychiatry: The medical science that deals with the origin, diagnosis, prevention, and
treatment of mental disorders. [NIH]

**Psychic:** Pertaining to the psyche or to the mind; mental. [EU]

**Psychoactive:** Those drugs which alter sensation, mood, consciousness or other psychological or behavioral functions. [NIH]

**Psychogenic:** Produced or caused by psychic or mental factors rather than organic factors. [EU]

**Psychological Tests:** Standardized tests designed to measure abilities, as in intelligence, aptitude, and achievement tests, or to evaluate personality traits. [NIH]

**Psychology:** The science dealing with the study of mental processes and behavior in man and animals. [NIH]

**Psychomotor:** Pertaining to motor effects of cerebral or psychic activity. [EU]

**Psychopathology:** The study of significant causes and processes in the development of mental illness. [NIH]

**Psychopharmacology:** The study of the effects of drugs on mental and behavioral activity. [NIH]

**Psychosis:** A mental disorder characterized by gross impairment in reality testing as evidenced by delusions, hallucinations, markedly incoherent speech, or disorganized and agitated behaviour without apparent awareness on the part of the patient of the incomprehensibility of his behaviour; the term is also used in a more general sense to refer to mental disorders in which mental functioning is sufficiently impaired as to interfere grossly with the patient's capacity to meet the ordinary demands of life. Historically, the term has been applied to many conditions, e.g. manic-depressive psychosis, that were first described in psychotic patients, although many patients with the disorder are not judged psychotic. [EU]

**Psychotomimetic:** Psychosis miming. [NIH]

**Psychotropic:** Exerting an effect upon the mind; capable of modifying mental activity; usually applied to drugs that effect the mental state. [EU]

**Public Health:** Branch of medicine concerned with the prevention and control of disease and disability, and the promotion of physical and mental health of the population on the international, national, state, or municipal level. [NIH]

**Public Policy:** A course or method of action selected, usually by a government, from among alternatives to guide and determine present and future decisions. [NIH]

**Publishing:** "The business or profession of the commercial production and issuance of literature" (Webster's 3d). It includes the publisher, publication processes, editing and editors. Production may be by conventional printing methods or by electronic publishing. [NIH]

**Pulmonary:** Relating to the lungs. [NIH]

**Pulmonary Artery:** The short wide vessel arising from the conus arteriosus of the right ventricle and conveying unaerated blood to the lungs. [NIH]

**Punishment:** The application of an unpleasant stimulus or penalty for the purpose of eliminating or correcting undesirable behavior. [NIH]

**Quality of Life:** A generic concept reflecting concern with the modification and enhancement of life attributes, e.g., physical, political, moral and social environment. [NIH]

**Radiation:** Emission or propagation of electromagnetic energy (waves/rays), or the waves/rays themselves; a stream of electromagnetic particles (electrons, neutrons, protons, alpha particles) or a mixture of these. The most common source is the sun. [NIH]
Radioimmunoassay: Classic quantitative assay for detection of antigen-antibody reactions using a radioactively labeled substance (radioligand) either directly or indirectly to measure the binding of the unlabeled substance to a specific antibody or other receptor system. Non-immunogenic substances (e.g., haptens) can be measured if coupled to larger carrier proteins (e.g., bovine gamma-globulin or human serum albumin) capable of inducing antibody formation. [NIH]

Randomized: Describes an experiment or clinical trial in which animal or human subjects are assigned by chance to separate groups that compare different treatments. [NIH]

Reality Testing: The individual's objective evaluation of the external world and the ability to differentiate adequately between it and the internal world; considered to be a primary ego function. [NIH]

Receptor: A molecule inside or on the surface of a cell that binds to a specific substance and causes a specific physiologic effect in the cell. [NIH]

Receptors, Serotonin: Cell-surface proteins that bind serotonin and trigger intracellular changes which influence the behavior of cells. Several types of serotonin receptors have been recognized which differ in their pharmacology, molecular biology, and mode of action. [NIH]

Recombinant: A cell or an individual with a new combination of genes not found together in either parent; usually applied to linked genes. [EU]

Rectum: The last 8 to 10 inches of the large intestine. [NIH]

Recurrence: The return of a sign, symptom, or disease after a remission. [NIH]

Refer: To send or direct for treatment, aid, information, decision. [NIH]

Regimen: A treatment plan that specifies the dosage, the schedule, and the duration of treatment. [NIH]

Reliability: Used technically, in a statistical sense, of consistency of a test with itself, i.e., the extent to which we can assume that it will yield the same result if repeated a second time. [NIH]

Remission: A decrease in or disappearance of signs and symptoms of cancer. In partial remission, some, but not all, signs and symptoms of cancer have disappeared. In complete remission, all signs and symptoms of cancer have disappeared, although there still may be cancer in the body. [NIH]

Respiration: The act of breathing with the lungs, consisting of inspiration, or the taking into the lungs of the ambient air, and of expiration, or the expelling of the modified air which contains more carbon dioxide than the air taken in (Blakiston's Gould Medical Dictionary, 4th ed.). This does not include tissue respiration (= oxygen consumption) or cell respiration (= cell respiration). [NIH]

Respiratory Physiology: Functions and activities of the respiratory tract as a whole or of any of its parts. [NIH]

Retrospective: Looking back at events that have already taken place. [NIH]

Retrospective study: A study that looks backward in time, usually using medical records and interviews with patients who already have or had a disease. [NIH]

Rhamnose: A methylpentose whose L-isomer is found naturally in many plant glycosides and some gram-negative bacterial lipopolysaccharides. [NIH]

Rigidity: Stiffness or inflexibility, chiefly that which is abnormal or morbid; rigor. [EU]

Risk factor: A habit, trait, condition, or genetic alteration that increases a person's chance of developing a disease. [NIH]

Risperidone: A selective blocker of dopamine D2 and serotonin-5-HT-2 receptors that acts
as an atypical antipsychotic agent. It has been shown to improve both positive and negative symptoms in the treatment of schizophrenia. [NIH]

**Saliva:** The clear, viscous fluid secreted by the salivary glands and mucous glands of the mouth. It contains mucins, water, organic salts, and ptylin. [NIH]

**Salivary:** The duct that convey saliva to the mouth. [NIH]

**Salivary glands:** Glands in the mouth that produce saliva. [NIH]

**Sarcoma:** A connective tissue neoplasm formed by proliferation of mesodermal cells; it is usually highly malignant. [NIH]

**Schizoid:** Having qualities resembling those found in greater degree in schizophrenics; a person of schizoid personality. [NIH]

**Schizophrenia:** A severe emotional disorder of psychotic depth characteristically marked by a retreat from reality with delusion formation, hallucinations, emotional disharmony, and regressive behavior. [NIH]

**Schizophrenia, Catatonic:** A type of schizophrenia characterized by abnormality of motor behavior which may involve particular forms of stupor, rigidity, excitement or inappropriate posture. [NIH]

**Schizotypal Personality Disorder:** A personality disorder in which there are oddities of thought (magical thinking, paranoid ideation, suspiciousness), perception (illusions, depersonalization), speech (digressive, vague, overelaborate), and behavior (inappropriate affect in social interactions, frequently social isolation) that are not severe enough to characterize schizophrenia. [NIH]

**Sclerosis:** A pathological process consisting of hardening or fibrosis of an anatomical structure, often a vessel or a nerve. [NIH]

**Screening:** Checking for disease when there are no symptoms. [NIH]

**Sedatives, Barbiturate:** Those derivatives of barbituric or thiobarbituric acid that are used as hypnotics or sedatives. The structural class of all such derivatives, regardless of use, is barbiturates. [NIH]

**Sediment:** A precipitate, especially one that is formed spontaneously. [EU]

**Semantics:** The relationships between symbols and their meanings. [NIH]

**Semen:** The thick, yellowish-white, viscid fluid secretion of male reproductive organs discharged upon ejaculation. In addition to reproductive organ secretions, it contains spermatozoa and their nutrient plasma. [NIH]

**Sensibility:** The ability to receive, feel and appreciate sensations and impressions; the quality of being sensitive; the extend to which a method gives results that are free from false negatives. [NIH]

**Septal:** An abscess occurring at the root of the tooth on the proximal surface. [NIH]

**Septal Nuclei:** Neural nuclei situated in the septal region. They have afferent and cholinergic efferent connections with a variety of forebrain and brainstem areas including the hippocampus, the lateral hypothalamus, the tegmentum, and the amygdala. Included are the dorsal, lateral, medial, and triangular septal nuclei, septofimbrial nucleus, nucleus of diagonal band, nucleus of anterior commissure, and the nucleus of stria terminalis. [NIH]

**Sequencing:** The determination of the order of nucleotides in a DNA or RNA chain. [NIH]

**Serologic:** Analysis of a person's serum, especially specific immune or lytic serums. [NIH]

**Serotonin:** A biochemical messenger and regulator, synthesized from the essential amino acid L-tryptophan. In humans it is found primarily in the central nervous system,
gastrointestinal tract, and blood platelets. Serotonin mediates several important physiological functions including neurotransmission, gastrointestinal motility, hemostasis, and cardiovascular integrity. Multiple receptor families (receptors, serotonin) explain the broad physiological actions and distribution of this biochemical mediator. [NIH]

**Serum:** The clear liquid part of the blood that remains after blood cells and clotting proteins have been removed. [NIH]

**Serum Albumin:** A major plasma protein that serves in maintaining the plasma colloidal osmotic pressure and transporting large organic anions. [NIH]

**Sex Characteristics:** Those characteristics that distinguish one sex from the other. The primary sex characteristics are the ovaries and testes and their related hormones. Secondary sex characteristics are those which are masculine or feminine but not directly related to reproduction. [NIH]

**Sexual Partners:** Married or single individuals who share sexual relations. [NIH]

**Shock:** The general bodily disturbance following a severe injury; an emotional or moral upset occasioned by some disturbing or unexpected experience; disruption of the circulation, which can upset all body functions: sometimes referred to as circulatory shock. [NIH]

**Side effect:** A consequence other than the one(s) for which an agent or measure is used, as the adverse effects produced by a drug, especially on a tissue or organ system other than the one sought to be benefited by its administration. [EU]

**Skeleton:** The framework that supports the soft tissues of vertebrate animals and protects many of their internal organs. The skeletons of vertebrates are made of bone and/or cartilage. [NIH]

**Skin test:** A test for an immune response to a compound by placing it on or under the skin. [NIH]

**Skull:** The skeleton of the head including the bones of the face and the bones enclosing the brain. [NIH]

**Small intestine:** The part of the digestive tract that is located between the stomach and the large intestine. [NIH]

**Smoking Cessation:** Discontinuation of the habit of smoking, the inhaling and exhaling of tobacco smoke. [NIH]

**Smooth muscle:** Muscle that performs automatic tasks, such as constricting blood vessels. [NIH]

**Social Environment:** The aggregate of social and cultural institutions, forms, patterns, and processes that influence the life of an individual or community. [NIH]

**Social psychology:** The branch of psychology concerned with mental processes operating in social groups. [NIH]

**Social Security:** Government sponsored social insurance programs. [NIH]

**Social Values:** Abstract standards or empirical variables in social life which are believed to be important and/or desirable. [NIH]

**Sodium:** An element that is a member of the alkali group of metals. It has the atomic symbol Na, atomic number 11, and atomic weight 23. With a valence of 1, it has a strong affinity for oxygen and other nonmetallic elements. Sodium provides the chief cation of the extracellular body fluids. Its salts are the most widely used in medicine. (From Dorland, 27th ed) Physiologically the sodium ion plays a major role in blood pressure regulation, maintenance of fluid volume, and electrolyte balance. [NIH]
Soft tissue: Refers to muscle, fat, fibrous tissue, blood vessels, or other supporting tissue of the body. [NIH]

Solvent: 1. Dissolving; effecting a solution. 2. A liquid that dissolves or that is capable of dissolving; the component of a solution that is present in greater amount. [EU]

Somatic: 1. Pertaining to or characteristic of the soma or body. 2. Pertaining to the body wall in contrast to the viscera. [EU]

Sound wave: An alteration of properties of an elastic medium, such as pressure, particle displacement, or density, that propagates through the medium, or a superposition of such alterations. [NIH]

Spasm: An involuntary contraction of a muscle or group of muscles. Spasms may involve skeletal muscle or smooth muscle. [NIH]

Spasticity: A state of hypertonicity, or increase over the normal tone of a muscle, with heightened deep tendon reflexes. [EU]

Specialist: In medicine, one who concentrates on 1 special branch of medical science. [NIH]

Species: A taxonomic category subordinate to a genus (or subgenus) and superior to a subspecies or variety, composed of individuals possessing common characters distinguishing them from other categories of individuals of the same taxonomic level. In taxonomic nomenclature, species are designated by the genus name followed by a Latin or Latinized adjective or noun. [EU]

Sperm: The fecundating fluid of the male. [NIH]

Sperm Motility: Ability of the spermatozoon to move by flagellate swimming. [NIH]

Spermatozoon: The mature male germ cell. [NIH]

Spinal cord: The main trunk or bundle of nerves running down the spine through holes in the spinal bone (the vertebrae) from the brain to the level of the lower back. [NIH]

Spinal Nerves: The 31 paired peripheral nerves formed by the union of the dorsal and ventral spinal roots from each spinal cord segment. The spinal nerve plexuses and the spinal roots are also included. [NIH]

Spontaneous Abortion: The non-induced birth of an embryo or of fetus prior to the stage of viability at about 20 weeks of gestation. [NIH]

Spores: The reproductive elements of lower organisms, such as protozoa, fungi, and cryptogamic plants. [NIH]

Stabilizer: A device for maintaining constant X-ray tube voltage or current. [NIH]

Stereotypy: Unvarying repetition or unvarying persistence. [NIH]

Stillbirth: The birth of a dead fetus or baby. [NIH]

Stimulant: 1. Producing stimulation; especially producing stimulation by causing tension on muscle fibre through the nervous tissue. 2. An agent or remedy that produces stimulation. [EU]

Stimulus: That which can elicit or evoke action (response) in a muscle, nerve, gland or other excitable issue, or cause an augmenting action upon any function or metabolic process. [NIH]

Stomach: An organ of digestion situated in the left upper quadrant of the abdomen between the termination of the esophagus and the beginning of the duodenum. [NIH]

Stress: Forcibly exerted influence; pressure. Any condition or situation that causes strain or tension. Stress may be either physical or psychologic, or both. [NIH]

Stroke: Sudden loss of function of part of the brain because of loss of blood flow. Stroke
may be caused by a clot (thrombosis) or rupture (hemorrhage) of a blood vessel to the brain. [NIH]

**Subarachnoid:** Situated or occurring between the arachnoid and the pia mater. [EU]

**Subspecies:** A category intermediate in rank between species and variety, based on a smaller number of correlated characters than are used to differentiate species and generally conditioned by geographical and/or ecological occurrence. [NIH]

**Substance P:** An eleven-amino acid neurotransmitter that appears in both the central and peripheral nervous systems. It is involved in transmission of pain, causes rapid contractions of the gastrointestinal smooth muscle, and modulates inflammatory and immune responses. [NIH]

**Sudden death:** Cardiac arrest caused by an irregular heartbeat. The term "death" is somewhat misleading, because some patients survive. [NIH]

**Suppression:** A conscious exclusion of disapproved desire contrary with repression, in which the process of exclusion is not conscious. [NIH]

**Sweat:** The fluid excreted by the sweat glands. It consists of water containing sodium chloride, phosphate, urea, ammonia, and other waste products. [NIH]

**Sweat Glands:** Sweat-producing structures that are embedded in the dermis. Each gland consists of a single tube, a coiled body, and a superficial duct. [NIH]

**Sympathomimetic:** 1. Mimicking the effects of impulses conveyed by adrenergic postganglionic fibres of the sympathetic nervous system. 2. An agent that produces effects similar to those of impulses conveyed by adrenergic postganglionic fibres of the sympathetic nervous system. Called also adrenergic. [EU]

**Symptomatology:** 1. That branch of medicine with treats of symptoms; the systematic discussion of symptoms. 2. The combined symptoms of a disease. [EU]

**Synaptic:** Pertaining to or affecting a synapse (= site of functional apposition between neurons, at which an impulse is transmitted from one neuron to another by electrical or chemical means); pertaining to synapsis (= pairing off in point-for-point association of homologous chromosomes from the male and female pronuclei during the early prophase of meiosis). [EU]

**Synaptic Transmission:** The communication from a neuron to a target (neuron, muscle, or secretory cell) across a synapse. In chemical synaptic transmission, the presynaptic neuron releases a neurotransmitter that diffuses across the synaptic cleft and binds to specific synaptic receptors. These activated receptors modulate ion channels and/or second-messenger systems to influence the postsynaptic cell. Electrical transmission is less common in the nervous system, and, as in other tissues, is mediated by gap junctions. [NIH]

**Synergistic:** Acting together; enhancing the effect of another force or agent. [EU]

**Systemic:** Affecting the entire body. [NIH]

**Tardive:** Marked by lateness, late; said of a disease in which the characteristic lesion is late in appearing. [EU]

**Temporal:** One of the two irregular bones forming part of the lateral surfaces and base of the skull, and containing the organs of hearing. [NIH]

**Tendon:** A discrete band of connective tissue mainly composed of parallel bundles of collagenous fibers by which muscles are attached, or two muscles bellies joined. [NIH]

**Teratogenicity:** The power to cause abnormal development. [NIH]

**Teratogens:** An agent that causes the production of physical defects in the developing embryo. [NIH]
**Testicular:** Pertaining to a testis. [EU]

**Testis:** Either of the paired male reproductive glands that produce the male germ cells and the male hormones. [NIH]

**Testosterone:** A hormone that promotes the development and maintenance of male sex characteristics. [NIH]

**Tetrahydrocannabinol:** A psychoactive compound extracted from the resin of Cannabis sativa (marihuana, hashish). The isomer delta-9-tetrahydrocannabinol (THC) is considered the most active form, producing characteristic mood and perceptual changes associated with this compound. Dronabinol is a synthetic form of delta-9-THC. [NIH]

**Thalamic:** Cell that reaches the lateral nucleus of amygdala. [NIH]

**Thalamus:** Paired bodies containing mostly gray substance and forming part of the lateral wall of the third ventricle of the brain. The thalamus represents the major portion of the diencephalon and is commonly divided into cellular aggregates known as nuclear groups. [NIH]

**Therapeutics:** The branch of medicine which is concerned with the treatment of diseases, palliative or curative. [NIH]

**Threshold:** For a specified sensory modality (e.g. light, sound, vibration), the lowest level (absolute threshold) or smallest difference (difference threshold, difference limen) or intensity of the stimulus discernible in prescribed conditions of stimulation. [NIH]

**Thrombin:** An enzyme formed from prothrombin that converts fibrinogen to fibrin. (Dorland, 27th ed) EC 3.4.21.5. [NIH]

**Thrombosis:** The formation or presence of a blood clot inside a blood vessel. [NIH]

**Thromboxanes:** Physiologically active compounds found in many organs of the body. They are formed in vivo from the prostaglandin endoperoxides and cause platelet aggregation, contraction of arteries, and other biological effects. Thromboxanes are important mediators of the actions of polyunsaturated fatty acids transformed by cyclooxygenase. [NIH]

**Thrombus:** An aggregation of blood factors, primarily platelets and fibrin with entrapment of cellular elements, frequently causing vascular obstruction at the point of its formation. Some authorities thus differentiate thrombus formation from simple coagulation or clot formation. [EU]

**Tin:** A trace element that is required in bone formation. It has the atomic symbol Sn, atomic number 50, and atomic weight 118.71. [NIH]

**Tissue:** A group or layer of cells that are alike in type and work together to perform a specific function. [NIH]

**Tolerance:** 1. The ability to endure unusually large doses of a drug or toxin. 2. Acquired drug tolerance; a decreasing response to repeated constant doses of a drug or the need for increasing doses to maintain a constant response. [EU]

**Tomography:** Imaging methods that result in sharp images of objects located on a chosen plane and blurred images located above or below the plane. [NIH]

**Tone:** 1. The normal degree of vigour and tension; in muscle, the resistance to passive elongation or stretch; tonus. 2. A particular quality of sound or of voice. 3. To make permanent, or to change, the color of silver stain by chemical treatment, usually with a heavy metal. [EU]

**Tonicity:** The normal state of muscular tension. [NIH]

**Topical:** On the surface of the body. [NIH]

**Toxic:** Having to do with poison or something harmful to the body. Toxic substances
usually cause unwanted side effects. [NIH]

**Toxicity:** The quality of being poisonous, especially the degree of virulence of a toxic microbe or of a poison. [EU]

**Toxicology:** The science concerned with the detection, chemical composition, and pharmacologic action of toxic substances or poisons and the treatment and prevention of toxic manifestations. [NIH]

**Toxin:** A poison; frequently used to refer specifically to a protein produced by some higher plants, certain animals, and pathogenic bacteria, which is highly toxic for other living organisms. Such substances are differentiated from the simple chemical poisons and the vegetable alkaloids by their high molecular weight and antigenicity. [EU]

**Tranquilizing Agents:** A traditional grouping of drugs said to have a soothing or calming effect on mood, thought, or behavior. Included here are the anti-anxiety agents (minor tranquilizers), antimanic agents, and the antipsychotic agents (major tranquilizers). These drugs act by different mechanisms and are used for different therapeutic purposes. [NIH]

**Transmitter:** A chemical substance which effects the passage of nerve impulses from one cell to the other at the synapse. [NIH]

**Trauma:** Any injury, wound, or shock, must frequently physical or structural shock, producing a disturbance. [NIH]

**Treatment Outcome:** Evaluation undertaken to assess the results or consequences of management and procedures used in combating disease in order to determine the efficacy, effectiveness, safety, practicability, etc., of these interventions in individual cases or series. [NIH]

**Tricyclic:** Containing three fused rings or closed chains in the molecular structure. [EU]

**Trigger zone:** Dolorogenic zone (= producing or causing pain). [EU]

**Tryptophan:** An essential amino acid that is necessary for normal growth in infants and for nitrogen balance in adults. It is a precursor serotonin and niacin. [NIH]

**Tuberculosis:** Any of the infectious diseases of man and other animals caused by species of Mycobacterium. [NIH]

**Tyramine:** An indirect sympathomimetic. Tyramine does not directly activate adrenergic receptors, but it can serve as a substrate for adrenergic uptake systems and monoamine oxidase so it prolongs the actions of adrenergic transmitters. It also provokes transmitter release from adrenergic terminals. Tyramine may be a neurotransmitter in some invertebrate nervous systems. [NIH]

**Tyrosine:** A non-essential amino acid. In animals it is synthesized from phenylalanine. It is also the precursor of epinephrine, thyroid hormones, and melanin. [NIH]

**Unconscious:** Experience which was once conscious, but was subsequently rejected, as the "personal unconscious". [NIH]

**Urethra:** The tube through which urine leaves the body. It empties urine from the bladder. [NIH]

**Urinalysis:** Examination of urine by chemical, physical, or microscopic means. Routine urinalysis usually includes performing chemical screening tests, determining specific gravity, observing any unusual color or odor, screening for bacteriuria, and examining the sediment microscopically. [NIH]

**Urinary:** Having to do with urine or the organs of the body that produce and get rid of urine. [NIH]

**Urine:** Fluid containing water and waste products. Urine is made by the kidneys, stored in
the bladder, and leaves the body through the urethra. [NIH]

**Urine Testing:** Checking urine to see if it contains glucose (sugar) and ketones. Special strips of paper or tablets (called reagents) are put into a small amount of urine or urine plus water. Changes in the color of the strip show the amount of glucose or ketones in the urine. Urine testing is the only way to check for the presence of ketones, a sign of serious illness. However, urine testing is less desirable than blood testing for monitoring the level of glucose in the body. [NIH]

**Vaccine:** A substance or group of substances meant to cause the immune system to respond to a tumor or to microorganisms, such as bacteria or viruses. [NIH]

**Vagina:** The muscular canal extending from the uterus to the exterior of the body. Also called the birth canal. [NIH]

**Vascular:** Pertaining to blood vessels or indicative of a copious blood supply. [EU]

**Vasodilation:** Physiological dilation of the blood vessels without anatomic change. For dilation with anatomic change, dilatation, pathologic or aneurysm (or specific aneurysm) is used. [NIH]

**Vasodilator:** An agent that widens blood vessels. [NIH]

**Vein:** Vessel-carrying blood from various parts of the body to the heart. [NIH]

**Ventilation:** 1. In respiratory physiology, the process of exchange of air between the lungs and the ambient air. Pulmonary ventilation (usually measured in litres per minute) refers to the total exchange, whereas alveolar ventilation refers to the effective ventilation of the alveoli, in which gas exchange with the blood takes place. 2. In psychiatry, verbalization of one's emotional problems. [EU]

**Vertebrae:** A bony unit of the segmented spinal column. [NIH]

**Vibrio:** A genus of Vibrionaceae, made up of short, slightly curved, motile, gram-negative rods. Various species produce cholera and other gastrointestinal disorders as well as abortion in sheep and cattle. [NIH]

**Vibrio cholerae:** The etiologic agent of cholera. [NIH]

**Viral:** Pertaining to, caused by, or of the nature of virus. [EU]

**Virulence:** The degree of pathogenicity within a group or species of microorganisms or viruses as indicated by case fatality rates and/or the ability of the organism to invade the tissues of the host. [NIH]

**Virus:** Submicroscopic organism that causes infectious disease. In cancer therapy, some viruses may be made into vaccines that help the body build an immune response to, and kill, tumor cells. [NIH]

**Visceral:** From viscus (a viscus) pertaining to a viscus. [EU]

**Vitro:** Descriptive of an event or enzyme reaction under experimental investigation occurring outside a living organism. Parts of an organism or microorganism are used together with artificial substrates and/or conditions. [NIH]

**Vivo:** Outside of or removed from the body of a living organism. [NIH]

**Warts:** Benign epidermal proliferations or tumors; some are viral in origin. [NIH]

**White blood cell:** A type of cell in the immune system that helps the body fight infection and disease. White blood cells include lymphocytes, granulocytes, macrophages, and others. [NIH]

**Withdrawal:** 1. A pathological retreat from interpersonal contact and social involvement, as may occur in schizophrenia, depression, or schizoid avoidant and schizotypal personality
disorders. 2. (DSM III-R) A substance-specific organic brain syndrome that follows the cessation of use or reduction in intake of a psychoactive substance that had been regularly used to induce a state of intoxication. [EU]

**Xenograft:** The cells of one species transplanted to another species. [NIH]
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