

Muslim mystics drinking coffee during all-night prayer sessions more than a thousand years ago, or native Indian Americans smoking tobacco before the Europeans arrived.

The use of herbal medicines and their methods of application (e.g. in foods, infusions, decoctions or extracts) was based on ethnic tradition, providing wide variability in the active chemicals obtained and the effects they produced. Plants contain many different constituents that might either cooperate in the desired effect of one constituent or antagonize this effect. For example, among the >30 alkaloids in the poppy plant *Papaver somniferum*, morphine has analgesic action whereas papaverine has an unwanted vasodilator effect. Thus, using pure morphine rather than opium could avoid this problem.

The number of people using herbal drugs has increased enormously in the past few years, possibly because of the erroneous conviction that these are more natural and less toxic than synthetic drugs and partly because of dissatisfaction with modern medicine. The wide use and free availability of psychoactive herbs creates an enormous potential for adverse drug interactions. Thus, in recent years scientific research has attempted to understand what each chemical constituent of a plant does and how these constituents interact. These are the basic points of this book, which attempts to integrate the different facets of a scientific approach to the basics of herbal psychopharmacology, from history and botany, chemistry and mechanisms of action, to pharmacology and toxicology.

Two chapters are dedicated to basic neuroscience and basic pharmacology, thus providing the reader with a background knowledge of essential concepts, such as the function of neurones or pharmacokinetics. The other seven chapters deal with specific classes of psychoactive plants: two are dedicated to stimulant plants and cognitive enhancers, which are extensively reviewed. Other chapters deal with herbal sedatives and anxiolytics, analgesics and anesthetics, hallucinogens and cannabis. From the chapter reviewing psychotherapeutic herbs it appears that herbal remedies to treat depression, anxiety and psychotic disorders are very few and far more studies are needed

to establish their effectiveness. Historically, *Rauwolfia* had long been used as a tranquillizer and antipsychotic until the advent of neuroleptics and newer atypical antipsychotic drugs, which made *Rauwolfia* obsolete, particularly considering its side-effects of depression and cognitive impairment as a result of monoamine depletion. Among plants with potential antidepressant and anxiolytic effects, *Ginger* and *Ginkgo biloba* need more research to establish their basic efficacy. The most promising is *Hypericum perforatum*, whose antidepressant effect is supported by a considerable amount of preclinical research, although its mechanism of action is still not understood. Clinical reports are controversial, and a large-scale study on St John's wort (which comprises the leaves and flowering tops of *H. perforatum*) for the treatment of depression is being conducted by the National Center for Complementary and Alternative Medicine, a branch of the US National Institutes of Health.

Overall, the book provides a good overview of herbal psychopharmacology, with details of chemical constituents, mechanisms and physiological effects of these medicines, with information on controlled clinical trials that address their safety and efficacy. Specific references and recommended readings are listed at the end of the book. This book could be of value to researchers and health-care practitioners, although it might seem somewhat out of date for people working in the specific fields because of the rapid progress of research in herbal medicine psychopharmacology. Also, the author should have underlined more clearly in the introduction that a new era of plant medicines must begin with modern science to avoid using herb extracts. On the basis of the mechanism of action of traditional plants, the identification and isolation of the active principles with original chemical structures offers a potential source of novel drugs, which should then follow the regulatory steps for drug research and development and be tested for the reliability of their effect in controlled clinical trials.

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Development of novel drug delivery systems

Drug Delivery: Engineering Principles for Drug Therapy

by W.M. Saltzman, Oxford University Press, 2001. £59.50 (hardback) (ix + 372 pages) ISBN 019 5085892



For many drugs, a well designed drug delivery system is as important as the pharmacological activities of the drug. A well designed drug delivery system can accurately deliver the drug to

the site of action at a desired rate and minimize its side-effects by reducing the exposure of the drug to other tissues. To develop such an advanced drug delivery system, basic biology, physiology, pharmacology, chemical engineering and pharmaceutical sciences must be understood, and there is definitely a need for a book to integrate all this essential knowledge. *Drug Delivery: Engineering Principles for Drug Therapy* aims to meet such a need.

This book provides the fundamental knowledge related to drug delivery, which includes the principles and mechanisms governing the release of the drug from preparations, and the diffusion, distribution and elimination of the drug molecules *in vivo*. The book also reviews the basic pharmaceutical approaches to modify drug properties for better performance *in vivo*, the concept and design of different advanced drug delivery systems, polymer chemistry and the polymers commonly used in various drug delivery systems. Polymer chemistry plays a key role in most advanced drug delivery systems. Therefore, the book covers, from basic knowledge, the design of drug delivery and the materials used in such delivery systems. In addition, this book presents many case studies of novel drug delivery systems, such as controlled delivery for systemic and local therapy by various means. These special delivery systems are frequently employed at present. Without doubt, these case studies provide excellent real examples

of the development of novel drug delivery systems to those new to this area. In some chapters, there are many mathematical calculations to describe drug release and distribution quantitatively. However, one must keep in mind that the *in vivo* situations might not fit into these calculation models because the real *in vivo* situations are always more complicated than *in vitro* situations and differ greatly from one situation to another. Furthermore, there are large variations among individual test subjects.

In summary, the combination of the different sciences related to drug delivery discussed in this book provides a complete introduction and guide to this exciting and expanding area of pharmaceutical science. It is a good textbook for students in pharmaceutical sciences and other related subjects. Indeed, this book is also a valuable resource and reference to those who are working in this research field.

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How to keep your favourite virus in check

Antiviral Agents: Advances and Problems
edited by E. Jucker, Birkhäuser, 2001. DM130 (paperback) (viii + 258 pages)
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Viral infections of all kinds have a significant impact on public health, and nowadays it looks as if this impact is ever increasing.

Although many of the pathogenic

viruses are old companions of mankind, the pandemics of both the human immunodeficiency virus (HIV) and the hepatitis C virus (HCV) emerged only in the 20th century. In the struggle with pathogens we distinguish between the treatment of disease and protection

against the disease. Protection against infectious disease was pioneered by the work of Jenner with vaccinia virus two centuries ago, and resulted in what is today known as vaccination. Jenner's approach culminated, 170 years later, in victory over small pox, the first and only example of a pathogen's eradication. Ironically, while vaccination against viral diseases resulted in further successes (particularly against, for example, polio and yellow fever) and while the advent of antibiotics equipped mankind to fight bacterial infections, there was virtually no progress in the therapy, let alone cure, of viral diseases. However, early attempts with rather unspecific compounds such as idoxuridine or amantadine permitted the identification of specific requirements and pitfalls of antiviral therapies. Because viral replication is intimately linked to host cell metabolism, it proved difficult to achieve acceptable therapeutic indices (efficacy versus toxicity). Thus, it was (and still is) essential to identify and characterize virally encoded proteins, preferentially enzymes, as potential drug targets that were specific for the viral life cycle. This requirement is also illustrated by the fact that nearly all early antiviral agents are nucleotide analogues, aimed at the suppression of the virus' polymerase. It was however only in the 1980s, with the advent of acyclovir, that a compound that selectively inhibited viral enzymes was found. Since then, the list of approved antiviral agents has grown, but most of these result from the tremendous efforts to cope with the HIV epidemic, with the known considerable, but still limited, success. Unfortunately, because many viruses have a propensity to develop latency, the difference between treatment and cure becomes only too clear.

The aim of *Antiviral Agents: Advances and Problems* is to introduce practitioners and advanced students to different viruses, to confront them with the latest research developments in addition to shortcomings of current treatment, and to indicate future directions. This book is the first volume of a 'special topic' series (which is to appear once a year, the following issue dealing with fungi) and contains updated review articles that were published earlier in *Progress in Drug Research*.

There are six contributions, covering HIV, influenza, HCV, hepatitis B virus (HBV), herpesviruses and picornaviruses. An instructive and near-to-comprehensive overview of current knowledge is provided for each virus covered, listing the different antiviral drugs available including those in clinical and preclinical testing. The inclusion of overviews on molecular biology in addition to *in vitro* and animal models used to study HCV and HBV extends the usefulness of these reviews to the fundamental researcher. Most of the sections contain important information on other potential virus-encoded drug targets, and one chapter specifically addresses proteases as targets for the treatment of different picornaviral infections.

Most chapters are highly informative and well written. Items such as vaccination, drug resistance, recombination and quasi-species are dealt with satisfactorily, justifying the ambition of this publication to provide more than just a snapshot of present advances. Very rarely, crucial points are omitted; for example, the fact that the treatment of influenza depends crucially on rapid diagnosis (within the first 48 h of infection), a fact that might severely compromise the use of neuraminidase inhibitors in practice, is not mentioned. The chapter on herpesviruses, while otherwise complete, lacks information about human herpesvirus 8 (HHV-8), the agent of Kaposi's sarcoma. A chapter on papilloma viruses or rotaviruses (one of the most important killers in the world) would have been good, which could well have replaced the section on HIV. Unfortunately, this section contains no introduction worth that name and deals with the sole development of protease inhibitors (concentrating on only one of them), and did not deserve to be included in this fine monography, which otherwise merits its place on the bookshelf of every virologist.

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