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Book reviews

Jean-Maurice Vergnaud, Iosif-Daniel Rosca, Assessing Bioavailability of Drug Delivery Systems, CRC Press, Taylor & Francis Group, Boca Raton, FL, USA, 2005 (248 pp., £74.99, ISBN 0-8493-3044-0)

The definition of *a drug* given by the World Health Organization is "any substance that is used to modify or explore physiological systems or pathological states for the benefit of the recipient." The way of delivering drugs into particular parts of the body must be chosen very carefully because the same remedy, which plays therapeutic role in one part of organism may cause damages in another part. Therefore, researchers must create a compound that delivers itself to the appropriate target with as low as possible toxicity and side effects. What is particularly interesting and thought provoking is the possible interaction and effects upon tissues and fluids containing functional carbohydrates. Moreover, in the pharmaceutical industry, before the drug is available and introduced to the common use it must pass clinical tests, during which side effects are identified and reduced, appropriate dosages are determined and effectiveness is confirmed. Additionally, no less important is the dosage form of the drug, and so one is looking at not only like an active agent of a remedy but also its excipients. Mathematical modeling is a very useful tool that helps, e.g., control the rate of release of the drug along the gastrointestinal tract (GIT) or absorption of the drug into the blood. Another very necessary definition in drug terminology is bioavailability, as a percentage of the drug absorbed from a given dosage form by the organism. The assessing is complicated particularly without mathematical models. Therefore, in modern pharmaceutical industry, application of some standard way of estimating drug parameters is very helpful.

"Assessing Availability of Drug Delivery Systems" is a book, which supplies theoretical and mathematical solutions for pharmacokinetics and pharmacodynamics processes. A brief overview about the intravenous administration as an effective way to deliver the drug in the patient's body is introduced in Chapters 1 and 2. Aspects of the administration of a single dose and of multidoses in succession are presented.

The processes that occur during drug transport in the body are: liberation of the drug from the dosage form along the GIT; diffusion of the drug through the gastrointestinal membrane into the liver and plasma compartment; absorption and distribution of the free drugs into tissues that leads to the therapeutic action; and finally clearance and elimination from the organism. The main pharmacokinetic parameters describing these processes (e.g., the rate constant of absorption, the apparent volume of distribution) are presented in detail (Chapter 3).

Bioavailability of the drugs might be different depending on the organism and the contents of the remedy. Thus, equations expressing the kinetics of drug release and calculating the plasma drug level have been derived (Chapter 4). Moreover, illustration of the *in vivo–in vitro* correlations is very useful according to immediate-release dosage forms. The dissolution phenomena could be more complex along the GIT than in the dissolution cells, especially when it is pointed out that at the very beginning of getting drugs into an organism there may be no drug released from the system and no drug absorbed through the GI membrane (Chapter 5).

The plasma drug level may be calculated with oral dosage forms and its release is controlled by diffusion. Assessment of the amount of drug in various places and effect of the shape of the dosage forms (e.g., cube, cylinder, and sphere) are some of the questions considered in Chapter 6.

Oral dosage forms, which may have release controlled by erosion, are prepared by dispersing the drug in an erodible polymer. Those biodegradable polymers can be obtained from pure polymers or by introducing some additives into the polymer that dissolve by provoking a progressive disintegration. Various methods and techniques used in order to study the mechanism of bioadhesion and its subsequent effect with the retention of the dosage forms are discussed (Chapter 7).

The effect of the patient noncompliance strongly depends on three factors: nature of disease, type of medication and interaction of the physician or pharmacist with the patient. More often than not it is believed that patient compliance is bad. Investigation proved that, e.g., the effect of an omission on one day could not be corrected by a double dosing the following day. Explanation of how various kinds of noncompliance affect bioavailability is presented in Chapter 8.

It is very important to know the kinetic information about the drug levels in blood and in various tissues or

organs, such as brain, liver, muscles, etc., especially in the case of intravenous drug delivery. Some pharmaceutical agents may move swiftly into the particular tissues; therefore, their concentration in drugs delivered intravenously must not be high. The ways of drug transfer in various tissues are widely described in Chapter 9.

Some transdermal therapeutic systems (TTS) are the way of drug delivery. The patch or plaster with drug extended release may be as thin as 150 μm and cover an area of 5–20 cm^2 of the skin surface. The patch should be applied to a part of the body where a skin has a constant thickness and constant high blood flow. This occurs mainly diffusion of the drug through the skin from the TTS–skin interface to the subcapillary plexus. It is one of the transdermal therapeutic systems, which are widely described in Chapter 10.

In conclusion, bioavailability of drug delivery systems is one of the most important parameter during researching new drugs and determination of their dosage forms. Their interaction with macromolecular structural and functional carbohydrates will be something that is going on at all times. However, this book might be very useful not only for researchers at university and in the pharmaceutical industry, but also for therapists devoted to curing patients at the hospital, for physicians and pharmacists staying permanently in touch with their ill customers and finally for professors and their students, who will be physicians, pharmacists and researchers of tomorrow.

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Wanda Baer-Dubowska, Agnieszka Bartoszek, Danuta Malejika-Giganti (Eds.), Carcinogenic and Anticarcinogenic Food Components, CRC Press, Boca Raton, FL, USA, 2006 (x + 393 pp., £74–99, ISBN 0-8493-2096-8)

Understanding both the benefits and risks to human health from the consumption of foods containing carcinogenic and anticarcinogenic substances is crucial for combating cancer. *Carcinogenic and Anticarcinogenic Food Components* explains the importance of dietary sources containing carcinogenic and anticarcinogenic components supported with latest clinical trials. It contains 17 chapters that each covers different aspects of carcinogenic and anticarcinogenic food components.

One third of all cancers are associated with dietary factors therefore it is essential to understand the basic concepts of food, cancer, the carcinogenic (cancer causing) and anticarcinogenic (cancer preventing) food components (Chapter 1). The molecular and cellular events during the multistage processes of chemical carcinogenesis involve initiation, promotion, benign neoplasm, progression and invasion (Chapter 2). The metabolic transformations of mutagens and carcinogens require the transformation of a chemically inert molecule to a DNA reactive agent (Chapter 3). Genotoxic refers to toxic and heritable effects to genetic material in germinal and somatic cells. Increasing human exposure to pollutants with carcinogenic activity and human lifestyle, including tobacco habits, excessive alcohol use, lack of exercise and above all dietary traditions, have also become implicated in the occurrence of diverse types of cancer (Chapter 4). The methods of food processing, preservation and cooking can influence the risk of cancer (Chapter 5). An increase in toxic inorganic and organic compounds in the environment due to intensive industrialization is drastically deteriorating the surface and ground water as well as agricultural land (Chapter 6). Reactive oxygen species are continuously produced by the human body and can get into cells causing DNA damage. Oxidatively damaged DNA has mutagenic potential, and its accumulation results in cancer (Chapter 7). The impact of dietary polyunsaturated fats in carcinogenesis is discussed in Chapter 8. The battle against cancer cannot be won by treatment alone and an alternative approach is needed. The basic mechanisms and targets of chemoprevention are discussed in Chapter 9. The subsequent chapters discuss anticarcinogenic food components, which include phenolic compounds in common, species (Chapter 10), tea and tea constituents (Chapter 11), wine polyphenols and resveratol (Chapter 12), flavonoids of fruit and vegetables (Chapter 13), carotenoids (Chapter 14), constituents of cruciferous vegetables (Chapter 15), and phytoestrogens (Chapter 16). The final chapter provides perspective on the impact of diet on cancer prevention based on human trials.

This book is designed for professionals employed by the food processing industry and food scientists, students of food science, nutritional and biomedical scientist involved in studies of cancer etiology and prevention.

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