



药学专业英语

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English in Pharmaceutics

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内 容 提 要

本书包括公共药学英语、药剂学、药物分析、生药学、药理学、药物化学、天然药物化学和制药工程等 8 个单元。每个单元包括药学专业词汇和专业文章,专业文章大部分摘自国外科技文献,每篇课文后面附有单词,文中的注解对文章作了必要的注释。

本书可作为药学类专业的学生和相关人员参考使用。

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前 言

本书是由佳木斯大学组织编写的药学类专业教材,可供药学、制药工程、中药、医药营销等专业的研究生、本科及专科生使用,参考学时为 40 学时。

《药学专业英语》在编写过程中,结合作者多年的教学经验,同时参考了国内近几年出版的有关教材。该书选用的文章典型生动、内容新颖、语言地道,与专业联系紧密,学生易于掌握。本教材旨在培养学生阅读有关药学专业英文材料的能力,掌握必要的药学英语词汇,为药学专业英语的交流和写作奠定坚实的基础。本书分 8 个单元,包括公共药学英语、药剂学、药物分析、生药学、药理学、药物化学、天然药物化学和制药工程的专业词汇以及相关的专业文章。

本书中的专业文章大部分摘自国外科技文献,文中量和单位的表示方法均遵照原文,未按我国的法定计量单位进行更改。

本书各章由以下人员编写:张宇编写第 4 单元和第 7 单元;吴刚编写第 1 单元;孙长海编写第 3 单元;苏瑾编写第 2 单元;刘立新编写第 5 单元;李进京编写第 6 单元和第 8 单元。

谨此感谢佳木斯大学化学与药学院的侯巍教授、于莲教授、沈德凤教授、焦淑清教授、王丽红副教授,他们对该书提出了宝贵意见。

由于编者水平有限,书中不足之处在所难免,恳请读者指正。

编 者
2006 年 7 月

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1.1 FDA's Responsibilities and Activities

1.1.1 What Is FDA?

The Food and Drug Administration has been described as the principal consumer protection agency of the Federal Government with good reason. A good number of the products found in a grocery or drug store are regulated by the FDA. Among the many Federal regulatory agencies, no other touches the day-to-day life of citizens so directly. Most people take for granted the wholesomeness of the food they buy, the truth of the label on a can of beans or a bottle of medicine, the sterility of an adhesive bandage, and the safety of their medical and dental X-rays. FDA's goal is to see that this confidence is warranted by ensuring industry's compliance with^① Federal laws regulating products in commerce.

- **The goal**

In the simplest terms, the provisions of these laws are intended to ensure that: (1) Food is safe and wholesome; (2) drugs (both human and

① compliance with: action in accordance with a request or command; obedience

veterinary), biological products (e. g., vaccines and blood for transfusion), and medical devices are safe and effective; (3) cosmetics are safe; (4) the use of radiological products does not result in unnecessary exposure to radiation; and (5) all of these products are honestly and informatively labelled.

Even the general terms employed here suggest the broad range of product categories under FDA's regulatory jurisdiction. However, they may not readily suggest the myriad of products within each category. Take drugs for example, besides the prescription filled by your pharmacist and the aspirin you buy over the counter, both fluoride toothpaste and dandruff shampoo are legally defined as drugs. Veterinary drugs must also be safe and effective. Medications for food-producing animals, often mixed with^① feeds, are closely monitored because remaining drug residues in the animal tissue are ultimately consumed at dinner tables.

A medical device may be as basic as sterile gauze or as sophisticated as a heart pacemaker. Electronic-radiological products are equally varied—including, for instance, TV sets, microwave ovens, and mercury-vapor lamps; machines used in industrial processes largely unknown to the public; and the X-ray machine common to every dentist's office and hospital.

The food and drug industry is as vast as it is complex. At least 125 000 establishments in the United States are inspected by FDA at one time or another, some of them with considerable frequency. In fiscal year 1979, over 50 000 samples of domestic and imported products were analyzed in FDA labs. FDA also processed over 50 000 public inquiries, and responded to^② more than 30 000 requests for information under the authority of the Freedom of Information Act. In 1979, FDA took action

① mix with: combine one thing with another; blend things together

② respond to: give a verbal or written answer; undertake sth.

on^① almost 14 000 petitions and applications for approval of drugs, medicated feeds, and food additives. (Actions include requests for further data as well as approvals and disapprovals.)

FDA regulates only those products over which it has jurisdiction. For example, the Agency does not regulate meat and poultry, child-proof medicine bottle caps, or tobacco—all products regulated by other Federal agencies.

1.1.2 FDA: Policeman or Teacher?

A few years ago, the big thing for the college age crowd was to dwell on^② the question, “who am I?”

Not only do persons undergo such identity crises but at times organizations and agencies also experience this type of traumatic soul-searching.

In a number of respects, the behavior of the Food and Drug Administration has appeared to the writer as suggesting that it is similarly uncertain as to its proper role or function. In particular, the Agency has often acted ambivalent and wavering, as it has moved back and forth between at least two distinctly different roles: namely, that of a police officer and that of a teacher.

By law, the FDA has responsibility to oversee the purity, quality, identity, safety, usefulness, and related characteristics of the nation's food, drug, and cosmetic supply. With this legal mandate, the Agency is clearly a regulatory body and must operate in a manner to assure compliance.

But compliance itself can be achieved by at least two different routes. There is, of course, that of close supervision and monitoring combined with various enforcement measures. However, to rely solely on

① take on: decide to do sth.

② dwell on: think, speak or write at length about sth.

this approach would virtually necessitate one FDA agent for each person being monitored—clearly an unrealistic system.

This same problem is encountered in other aspects of day-to-day living; for example, adherence to^① traffic regulations and payment of income taxes. Both of these systems basically rely on voluntary compliance by the general public, coupled with spot checks of driving speed and sampling of tax returns for auditing. Similarly, the FDA must primarily rely on the voluntary compliance of those who operate within the professions and industries that are responsible for the products over which the FDA has jurisdiction. This voluntary compliance is encouraged by a parallel program of regulatory enforcement via product sampling, hatch testing, marketplace surveys, plant inspections, and so on.

The relative emphasis which the Agency places on the voluntary route versus the enforcement route varies greatly from time-to-time depending upon a number of factors.

Among these is the “philosophic bent” of those persons who happen to^② be in the upper echelons of FDA at any given time. In particular^③, if the persons at the top are enforcement oriented, it can be expected that the general tenor of the Agency will reflect that leaning. Conversely, if they are education oriented, it is more likely that they will generally opt for policies that are persuasive toward voluntary compliance.

Again, there is an interesting corollary to be drawn from^④ daily life. Society has learned that people’s attitude regarding their police force is largely shaped when they are small children. It is far better if children can be taught that the policeman is there to help them and protect them than it is to make them fearful by scaring them with warnings that “the

① adherence to; remain attached (to sth.); stick as if by means of glue or suction

② happen to; be the experience or fate of sb./sth.

③ in particular; especially or specifically

④ draw from: gain or derive sth. from study, experience, etc.

policeman is going to catch you!" By the same token, we expect that the police force will behave in a manner that warrants the trust and respect of both children and adults.

Similarly, if the FDA is to have both the trust and respect of those with whom it interfaces, then it also will need to conduct itself in a manner that encourages such an attitude.

Vocabulary and Phrases

grocery	<i>n.</i> 杂货业; 杂货店
principal	<i>a.</i> 主要的, 首要的
regulate	<i>v.</i> (以制度) 控制或管理(某事物); 调校, 校准, 控制
regulator	<i>n.</i> 调节器, 整时器
wholesomeness	<i>n.</i> 有益健康; 合乎卫生
sterility	<i>n.</i> 消毒, 无菌
adhesive	<i>a.</i> 粘着的, 带胶的
bandage	<i>n.</i> 绷带
dental	<i>a.</i> 牙齿的, 牙科的
warrant	<i>v.</i> 保证; 担保
provision	<i>n.</i> 供应, 供给, 提供
veterinary	<i>a.</i> 兽医的
vaccine	<i>n.</i> 牛痘的; 疫苗, 菌苗
transfusion	<i>n.</i> 输血
device	<i>n.</i> 装置, 器具
cosmetic	<i>n.</i> 化妆品
radiological	<i>a.</i> 放射学的, (应用) 辐射学的
informatively	<i>ad.</i> 提供知识情报地, 有益地
jurisdiction	<i>n.</i> 司法权; 管辖权
category	<i>n.</i> 种类, 类别, 范畴
myriad	<i>n.</i> 无数; 一万
prescription	<i>n.</i> 处方, 药方

fluoride	<i>n.</i> 氟化物
dandruff	<i>n.</i> 头皮屑
shampoo	<i>n.</i> 洗发精; 香波
residue	<i>n.</i> 剩余物, 残余
sterile	<i>a.</i> 无菌的, 消毒
gauze	<i>n.</i> 纱布
sophisticate	<i>n.</i> 老于世故的人
pacemaker	<i>n.</i> 起搏器
dentist	<i>n.</i> 牙科医生
considerable	<i>a.</i> 相当多的, 相当大的
frequency	<i>n.</i> 频率
fiscal	<i>a.</i> 财政的, 会计的
inquiry	<i>n.</i> 请求帮助, 询问
petition	<i>n.</i> 申请书
jurisdiction	<i>n.</i> 司法, 司法权; 审判权; 裁判权; 管辖权限
poultry	<i>n.</i> 家禽的肉
traumatic	<i>a.</i> 外伤的; 创伤的
soul-searching	深刻反省, 自省
respect	<i>n.</i> 尊敬, 敬重, 钦敬
ambivalent	<i>a.</i> 自相矛盾的, 模棱两可的
audit	<i>v.</i> 审计, 查账
distinctly	<i>ad.</i> 清楚地, 明显地
mandate	<i>n.</i> 命令, 指示
supervision	<i>n.</i> 监督, 管理, 指导
enforcement	<i>n.</i> 厉行, 强迫; 实行, 执行
unrealistic	<i>a.</i> 虚幻的
parallel	<i>a.</i> 平行的
survey	<i>n.</i> 全面的观察, 检查或论述
versus	<i>prep.</i> 与……相对

echelon	<i>n.</i> 指挥阶层, 梯队
orient	<i>n.</i> 东方国家; 方向
tenor	<i>n.</i> 要旨, 路程
opt for	赞成选择; 倾向于
persuasive	<i>a.</i> 能劝诱的; 说服的
corollary	<i>n.</i> 推论, 自然之结果
leaning	<i>n.</i> 倾向, 倾斜
scare	<i>v.</i> 受惊; 恐吓
interface	<i>v.</i> 使结合; 使相互作用; <i>n.</i> 分界面; 接触面
philosophic	<i>a.</i> 哲学的
batch	<i>n.</i> 一批(生产量), 一组, 一群

1.2 Developing Drugs from Traditional Medicinal Plants

Over three quarters of the world's population rely mainly on^① plants and plant extracts for health care. Approximately one third of the prescription drugs in the U.S. contain plant components, and more than 120 important prescription drugs are derived from^② plants. Most of these drugs were developed because of their use in traditional medicine. Economically, this represents \$ $(8 \sim 10) \times 10^9$ of annual consumer spending. Recent World Health Organization (WHO) studies indicate that over 30 percent of the world's plant species have at one time or another been used for medicinal purposes. Of the 250 000 higher plant species on Earth, more than 80 000 species are medicinal. Although traditional medicine is widespread throughout the world, it is an integral part of each individual culture. Its practice is based mainly on^③

① rely on: count or depend on sb./sth.

② derive from: have sth. as a starting-point, source or origin

③ base sth. on sth.: use sth. as grounds, evidence, etc. for sth. else

traditional beliefs handed down^① from generation to generation for hundreds or even thousands of years. Unfortunately, much of this ancient knowledge and many valuable plants are being lost at an alarming rate. The scientific study of traditional medicines and the systematic preservation of medicinal plants are thus of great importance.

For quite a long time, the only way to use plant medicines was either direct application or the use of crude plant extracts. With the development of organic chemistry at the beginning of this century, extraction and fractionation techniques improved significantly. It became possible to isolate and identify many of the active chemicals from plants. In the 1940s, advances in chemical synthesis enabled the synthesis of many plant components and their derivatives. In western countries, it was thought that chemical synthesis of drugs would be more effective and economical than isolation from natural sources. Indeed, this is true in many cases. However, in many other cases, synthetic analogues are not as effective as their natural counterparts. In addition, some synthetic drugs cost many times more than natural ones. Inspired by these realizations, coupled with^② the fact that many drugs with complex structures may be totally impossible to synthesise, there is now a resurgent trend of returning to natural resources for drug development.

1.2.1 Important Prescriptive Drugs from Plants

Ephedrine is the oldest and most classic example of a prescriptive drug developed from a traditional medicinal plant. It is derived from Ma Huang, a leafless shrub. Used to relieve asthma and hay fever in China for over 5 000 years, it was introduced into^③ western medicine in 1924 by Chen and Schmidt. Ephedrine is an alkaloid closely related to

① hand sth. down (to sb.): pass sth. on by tradition, inheritance, etc.

② couple with: link or associate sb./sth. with sb./sth.

③ introduce into: bring sth. into use or operation for the first time

adrenaline, the major product of the adrenal gland. Pharmacologically, Ephedrine is used extensively to stimulate increased activity of the sympathetic nervous system. It is used as a pressor agent to counteract hypotension associated with^① anaesthesia, and as a nasal decongestant. The drug action of this medicine is based both on its direct effect on α and β adrenergic receptors and on the release of endogenous noradrenaline.

Digitalis is one of the most frequently used medications in the treatment of heart failure and arrhythmia. It increases the contractility of the heart muscle and modifies vascular resistance. It also slows conduction through the atrioventricular node in the heart, making it useful in the treatment of atrial fibrillation and other rapid heart rhythms.

Digitalis is found in the leaves and seeds of *Digitalis purpurea* and *Digitalis lanata*, commonly known as the foxglove plant. Foxglove has been used in traditional medicine in many parts of the world—by African natives as arrow poisons, by the ancient Egyptians as heart medicine, and by the Romans as a diuretic, heart tonic, emetic and rat poison. The Chinese, who found this ingredient not only in plants but also in the dry skin and venom of the common toad, used it for centuries as a cardiac drug. In the western world, the foxglove was first mentioned in 1250 in the writing of a physician, Walsh, and it was described botanically in the 1500s.

Digitalis is a glycoside containing an aglycone, or genin, linked to between one and four sugar molecules. The pharmacological activity resides in the aglycone, whereas the sugar residues affect the solubility and potency of the drug. The aglycone is structurally related to bile acids, sterols, sex hormones and adrenocortical hormones.

d - Tubocurarine and its derivatives are the most frequently used drugs in operating rooms to provide muscle relaxation and prevent muscle

① associate with: join (people or things) together; connect (ideas, etc.) in one's mind

spasm. These agents interrupt the transmission of the nerve impulse at the skeletal neuromuscular junction. Curare, the common name for South American arrow poisons, has a long and interesting history. It has been used for centuries by Indians along the Amazon and Orinoco rivers for hunting. It causes paralysis of the skeletal muscles of animals and finally results in death. The methods of curare preparation were a secret entrusted only to tribal doctors. Soon after their discovery of the American continent, European explorers became interested in curare. In the late 16th century, samples of native preparations were brought to^① Europe for investigation. Curare, an alkaloid, was found in various species of *Strychnos* and certain species of *chondrodendron*. The first use of curare for muscle relaxation was reported in 1942 by Griffith and Johnson. This drug offers optimal muscular relaxation without the use of high doses of anaesthetics. It thus emerged as the chief drug for use in tracheal intubation and during surgery.

Vinblastine and Vincristine are two of the most potent antitumor drugs. They are obtained from *Catharanthus roseus*, commonly known as^② the rosy periwinkle. This plant, indigenous to Madagascar, is also cultivated in India, Israel and the U.S.. It was originally examined for clinical use because of its traditional use in treating diabetes. The leaves and roots of this plant contain more than 100 alkaloids. Fraction of these extracts yields four active alkaloids: Vinblastine, Vincristine, Vinleurosine and Vinresidine. These alkaloids are asymmetric dimeric compounds referred to^③ as vinca alkaloids, but of these, only Vinblastine and Vincristine are clinically important antitumor agents. These two alkaloids are cell-cycle specific agents that block mitosis (cell division). Vincristine sulphate is used to treat acute leukaemia in children and

① bring to; convert sb., esp. to one's point of view

② known as; call, nickname or label sb./sth. as sb./sth.

③ refer to; send sb./sth. to sb./sth. for help, advice, action, etc.

lymphocytic leukaemia. It is also effective against Wilm's tumour, neuroblastoma, rhabdomyosarcoma (tumour of voluntary or striped muscle cells), reticulum cell sarcoma and Hodgkin's disease. Vinblastine sulphate is used in the treatment of Hodgkin's disease, lymphosarcoma, choriocarcinoma, neuroblastoma, carcinoma of breast, lung and other organs, and in acute and chronic leukaemia.

1.2.2 Emerging Plant Medicines

Artemisinin is the most recent anti-malaria drug developed from plant-based traditional medicine. It is isolated from the leaves and flowers of *Artemisia annual*. (Compositae), commonly known as the sweet wormwood, a cousin of tarragon. Indigenous to China, the extract of this plant is traditionally known as the Qing Hao. It has been used to treat malaria in China for over 2 000 years. Its active component, Artemisinin, was first isolated in the 1970s by Chinese scientists. Unlike Quinine and Chloroquine, this compound is non-toxic rapid in effect, and safe for pregnant women. Furthermore, it is effective against chloroquine-resistant *Plasmodium falciparum* malaria and in patients with cerebral malaria. It kills the parasites directly so parasitemia is quickly controlled. This work was confirmed by the WHO in Africa and other parts of Southeast Asia.

Artemisinin is an endoperoxide of the sesquiterpene lactone. The structure of this compound is too complex to be synthesised effectively. *Artemisia* is also found in many parts of the U.S., abundantly along the Potomac River in Washington, D. C., but the drug content of these varieties is only about half that of the Chinese variety. Currently, the WHO and the U.S. are jointly engaged in^① the cultivation of Chinese *Artemisia* for worldwide use. This recent development offers renewed hope for using traditional medicine to provide new drugs for future medicines.

① engage in: (cause sb. to) take part in or be occupied in sth.