卫生部规划教材

全国高等医药院校教材

供药学类专业用

药学英语

第二版

下册

胡廷熹　主编

人民卫生出版社

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全国高等医药院校药学专业
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为适应我国高等药学教育的改革和发展，在总结前三轮药学专业教材编写经验的基础上，卫生部教材办公室于1996年9月决定进行第四轮教材修订，根据药学专业的培养目标，确定了第四轮教材品种和修订的指导思想，药学本科教育的培养对象是从事一般药物制剂、鉴定及临床合理用药等工作的药师，教材修订应紧紧围绕培养目标，突出各学科的基本理论、基本知识，同时又反映学科的新进展。该套教材可供药学及相关专业选用。全套教材共22种，均经卫生部聘任的全国药学专业教材评审委员会审定。教材目录如下：

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前　言

《药学英语》是在药学院系学生一、二年级英语教材基础上的药学专业英语教材。本套教材旨在培养学生阅读有关英语专业材料的能力，掌握必要的词汇，为专业内容的语言交流（口语和写作）打下坚实的基础。教材包括基础部分五十课课文及有关阅读材料五十篇。题材专业内容新颖，语言地道，学生易于吸收。每课中有词汇注解、课文注解和习题。教材还包括各专业（药物化学、药剂学、药理学、药物分析、生药学、生物化学和植物化学）的专业词汇及各类型专业文章，均取自国外近年的药学书刊和杂志。教科书最后部分为附录：（1）药学英语写作技巧；（2）总词汇表。本书分两册出版，上册内容为基础药学英语，下册内容为专业药学英语。

参加编写的有北京医科大学、上海医科大学、广东药学院、沈阳药科大学、华西医科大学、第二军医大学及中国药科大学的有关教授们。另外，特别聘请中国药科大学药学英语教师张宇辉同志为本教材秘书。

为了提高专业部分编写质量，特邀请中国药科大学赵守训教授（植物化学）、吴梧桐教授（生物化学）、李谦老师（生物化学）、刘国卿教授（药理学）、徐珞珊教授（生药学）、吉民副教授（药物化学）审查词汇和专业文章。本文特别重视校对工作，为最大限度地消除拼写错误，专门成立了校对小组。参加小组工作的除担任本书秘书的张宇辉老师外，还有中国药科大学九六级英语药学专业的钟莎、马欣、金飞燕、王森、王磊、王湛、周洲、张峻颖、高涛、唐铁鑫、张苡、刘明、刘泉等同学。此外，编者之一北京医科大学的郭莉萍老师又对全书作了细致的总体校阅及语言润色。他们工作认真，一丝不苟，使本书编写工作按时完成。在此本人一并致以衷心的感谢!

由于主编水平所限。谬误之处在所难免，敬请读者指正。

胡廷熹

于中国药科大学

1999.10

Table of Contents

1.1 药物化学词汇

Special Terms for Medicinal Chemistry

A

acetamide derivative 乙酰胺衍生物
acetate 乙酸盐
acetic acid 醋酸
acetone 丙酮
acetylene 乙炔
acetylpenicillamine 乙酰青霉胺
acetylsalicylic acid 乙酰水杨酸
acid-catalyzed ketal formation 酸催化缩酮结构
acidic 酸性的
acidification 酸化
acquired immunodeficiency syndrome 获得性免疫缺陷综合征
activation 活化，激化
acylating 酰化
adrenergic agent 肾上腺素能药
adrenergic blocking agent 肾上腺素能阻断剂
adverse reaction 副反应
affinity 亲和力
alcohol 乙醇
aldehyde 醛
alkane 链烷
alkyl 烷基
alkyl phenol 烷基酚
alkylamine 烷基胺
alkylaminoketone 烷基胺酮
alkylating 烷化
alkylsufonamidophenethanolamine 烷基磺酰基苯乙基胺
aluminum 铝
amide 酰胺
amidification in prodrug 前药中的酰胺化
amidinopenicillanic acid 脒基青霉烷酸
amino acid 氨基酸
amino-3-indolepropionic acid 氨基-3-吲哚丙酸
aminobenzoate 氨基苯甲酸酯
amino-beta-hydroxybutyric acid 氨基-β-羟基丁酸
amino-beta-hydroxypropionic acid 氨基-β-羟基丙酸
amino-beta-mercaptopropionic acid 氨基-β-巯基丙酸
aminocephalosporanic acid 氨基头孢烷酸
aminoglutaramic acid 氨基戊酰胺酸
aminopyrazines, diuretic 氨基吡嗪，利尿剂
aminosalicylic acid 氨基水杨酸
aminosuccinic acid 天门冬氨酸
aminothiadiazole 氨基噻二唑
aminomethylbenzoic acid 氨基甲基苯甲酸
amyl nitrite 亚硝酸异戊酯
analgesic 止痛药
analog 类似物

analog-prodrug hybrid 类似前药杂化
anesthesia 麻醉
anti-adiposity drug 抗肥胖症药
anti-adrogen 抗雄激素
anti-amebic agent 抗阿米巴药
anti-anginal agent 抗绞痛药
anti-anxiety agent 抗焦虑药
anti-arrhythmatic agent 抗心律失常药
anti-arthritic agent 抗关节炎药
anti-asthmatic drug 镇咳药
antibacterial 抗细菌的
antibiotics 抗生素
anti-convulsant agent 抗惊厥药
anti-depressant agent 抗抑郁药
anti-diabetic agent 抗糖尿病药
anti-diarrheal agent 抗腹泻药
anti-dopaminergic drug 抗多巴胺能药
anti-emetic agent 止吐药
anti-epileptics 抗癫痫药
anti-estrogen 抗雌激素
anti-filarial drug 抗丝虫药
antifungal 抗真菌的
anti-helminthic drug 抗蠕虫药
anti-hemophilic 抗血友病的
anti-hemorrhoidal agent 抗痔药
anti-histamine 抗组胺药
anti-hypertensive agent 抗高血压药
anti-inflammatory agent 抗炎药
anti-inhibitor coagulant complex 抗抑制剂促凝剂复合物
anti-leishmanial agent 抗利什曼虫药
anti-leprosy agent 抗麻风药
anti-lipemic agent 抗血脂药
anti-malarial 抗疟药
anti-metabolite 抗代谢药
anti-migraine drug 抗偏头痛药
anti-protozoal agent 抗原生动物药
anti-psychotic 抗精神病药
anti-oxidant 抗氧化剂
antipyretic 退热药
anti-rheumatics 抗风湿药
anti-schistosomal drug 抗血吸虫药
antiseptics 防腐剂
anti-spasmodic agent 解痉药
anti-thrombotics 抗血栓形成药
anti-thyroid agent 抗甲状腺药
anti-trematodes 抗吸虫药
anti-trichomonal 抗毛滴虫药
anti-tuberculous agent 抗结核药
anti-tussive 镇咳药
anti-ulcer agent 抗溃疡药
anti-varicose drug 抗静脉曲张药
antiviral agent 抗病毒药
arylacetic acid derivative 芳基乙酸衍生物
arylalkylamine 芳基烷胺
ascorbic acid 抗坏血酸
ascorbyl palmitate 抗坏血酸棕榈酸酯

B

β-lactamase β-内酰胺酶
basic 碱性的
benzimidazole 苯并咪唑
benzoaldehyde 苯甲醛
benzodiazepine 苯并二氮
benzofuran 苯并呋喃
benzoic acid 苯甲酸
benzophenone 二苯酮
benzoylperoxide 过氧化苯甲酰
benzquinamide 苯喹胺(止吐药)
bichloracetic acid 二氯乙酸
bicyclic compound 二环化合物
biphenylacetic acid 联苯乙酸
β-lactam antibiotics β-内酰胺抗生素

bulky group 空间障碍基团
bond-covalent 共价键
bond-dipole 偶极键
bond-hydrogen 氢键
bond-ion-dipole 离子偶极键
bond-ionic 离子键
bretylium tosylate 溴苯铵(降压药)
broad-spectrum antibacterial agent 广谱抗菌剂
bromide 溴化物
buffer 缓冲剂
butoxyethyl nicotinate 烟酸丁氧乙基酯

C

carbohydrate metabolism drug 碳水化合物代谢药
carbutamide 磺胺丁脲(低血糖)
cardiac glycoside 强心甙
cardiovascular agent 心血管药
cephalosporanic acid 头孢烷酸
cephalosporin 头孢菌素
channel blocker 通道阻断剂
channel former 通道构象
charge densities 电荷密度
charge transfer 电荷转移
chelating 螯合
chelating agent 螯合剂
chemical name 化学名
chemical structure 化学结构
chemoreceptor trigger zone 化合受体触发区域
chemotherapeutic 化疗的
chiral center 手性中心
chloramphenicol 氯霉素
chloride 氯化物
cholinomimetic 拟胆碱作用的
chromic chloride 氯化铬
complementarity between drug and receptor 药物受体之间互补
compoud 化合物
computer assisted drug design 计算机辅助药物设计
configuration 构型
conformation 构象
congener 同族元素
conjugation 共轭
conjugative effect 共轭效应
constant values of substituent 取代基常数值
cooperative effect 协同效应
coumarin 香豆素
cyclohexanone 环己酮
cyclophosphamide 环磷酰胺(抗肿瘤)

D

dealkylation 去烷基化
deamination 脱氨基
dehalogenation 去卤化
dehydroacetic acid 脱氢乙酸
Development of adrenocorticoid drugs 类肾上腺皮质激素药物的进展
dichlorotetrafluoroethane 二氢四氟乙烷
diphenylpropylamines and isosteres 二苯基丙胺及异构体
disulfide 二硫化物
diuretic 利尿剂
dopamine 多巴胺
double esters 二酯
drug-parasite-host relationship 药物、寄生虫和宿主间关系

E

electron charge distribution 电子电荷

的分布
electronic affinity 电子亲和力
electronic charge density 电荷密度
electronic distribution 电子分布
electronic polarizability 电极化
electronic states 电状态
electrophilic 亲电性
empirical electronic parameter 经验电参数
endogenous substance 内源性物质
epimerization 差向异构化
epinephrine 肾上腺素
epoxide 环氧化合物
esterification 酯化
estradiol 雌二醇
ether 醚
ethyl 乙基
ethylenediamine 乙二胺

F

fluoroacetamide 氟乙酰胺
food additive 食物添加剂
formaldehyde 甲醛
formate 甲酸盐
free valence 游离价
frontier electron density 前沿电荷密度

G

gases 气体
general structure 一般结构
glucose 葡萄糖
glycinate 甘氨酸盐
glycoside 糖苷
group 基团

H

haloacetamide 乙酰胺盐
halogen 卤素
halogenation 卤化
hammett's constant Hamme 比常数
Hansch's equation 汉施方程
hair growth stimulant 毛发生长刺激
heteroarylacetic acid 杂环芳基乙酸
heterocyclic compound 杂环化合物
heterocyclic isosteres 杂环异构体
highest occupied molecular 最高占有分子
histamine 组胺
HOMO (highest occupied molecular orbital) 最高能量占有轨道
Hueckel molecular orbital Huecked 分子轨道
hybrid 杂化物
hybrid substances 杂化物
hybridization 杂交
hydrazino 肼基
hydrochloric acid 盐酸
hydroclorothiazide 氢氯噻嗪
hydroidic acid 氢碘酸
hydrophilia 亲水性
hydrophobic interaction 疏水作用
hydrophobicity constant 疏水性常数
hydroxide 氢氧化合物
hydroxy (前缀)羟基
hydroxyl group 羟基
hydroxylamine 羟胺
hydroxylation 羟基化
hydroxypropyl 羟基丙基
hydroxyurea 羟基脲
hypochlorites 次氯酸盐

I

imidazole 咪唑
imidazoline 咪唑啉

immunomodulator 免疫调节剂
immunostimulant drug 免疫刺激剂
indolealklamine alkaloid 吲哚烷胺生物碱
insecticide 杀虫剂
interatomic distance 原子间距
intrinsic activity 内在活性
iobutoic acid 异丁酸
iodine 碘
ion-exchange resin 离子交换树脂
ionization 离子化
iron 铁
isobutyltriphenyl butylamine 异丁基三苯基丁胺
isomer 异构体
isoprofen 异布洛芬
isosteres 异构体
isosterism 异构化

J

journals on medicinal chemistry 药物化学杂志

L

latentiation 潜伏化
lead optimization 先导优化
linear free-energy model 线性自由能模型
lipid solubility of absorption 吸收的脂溶性
liposolubility 脂溶性
lowest empty molecular orbital 最低能量空轨道

M

macrolide antibiotics 大环内酯抗生素
macromolecular 大分子
Mannich 曼尼期(人名)
mechanism of action 作用机制
mercaptopurine 巯基嘌呤
metal 金属
methyl 甲基
methylchromone 甲基色酮
methyldopa 甲基多巴
methylhexaneamine 甲基已胺
modeling 模拟
models of action 作用模型
molar 摩尔
molecular modification 分子修饰
muscarine 蕈毒碱
muscle relaxant 肌松剂
mutual prodrug 协同前药

N

nasal decongestant 鼻减充血剂
nervous system 神经系统
net electronic charge 净电荷
nicotinamide 烟酰胺
nicotinate 烟酸酯(盐)
nitrate ester 硝酸酯
nitric acid 硝酸
nitriles 腈
nitro- 硝基
nitrogen 氮气
nitrogen mustard 氮芥
nitroheterocyclic derivatives 硝基杂环衍生物
nitrous oxide 氧化亚氮
nitrobenzamides 硝基苯甲酰胺
nondepolarizing 非去极化
non-specific drug 非特性药
non-steroidal anti-inflammatory agent 非甾体抗炎药
nuclear magnetic resonance 核磁共振

O

occupancy theory 占有理论
octanoic acid 辛酸
optimization 优化
organic iodine 有机碘
organometallic compound 有机金属化合物
organophosphates 有机磷酸盐
oxidation 氧化
oxide 氧化物
oxide formation 氧化物生成
oxidizing agent 氧化剂
oxygen 氧

P

palmitate 棕榈酸酯(盐)
paraformaldehyde 多聚甲醛
parameter 参数
partition coefficient 分配系数
penicillamine 青霉胺
penicillin 青霉素
perchlorate 高氯酸盐
permanganate 高锰酸盐
peroxide 过氧化物
pharmaceutical 制药的
pharmacochemistry 药物化学
pharmacophore 药效基团
pharmacophoric moieties 药效团的部分
phenol 苯酚
phenothiazine 吩噻嗪
phenylacetic acid 苯乙酸
phenylalkylamine 苯烷胺
phenylbutyric acid 苯基丁酸
phenylethyl alcohol 苯乙醇
phosphate 磷酸盐(酯)
phosphoric acid 磷酸
phosphorylating agent 磷酰化剂
physicochemical properties 物化性质
physiological 生理的
piperazine 哌嗪
piperazinedione 哌嗪二酮
piperidione 哌啶二酮
polarizability 极化
polyethylene 聚乙烯
polymer 多聚体
polystyrene sulfonate 硫酸聚苯乙烯
polyvinyl 聚乙烯
potassium 钾
prodrug 前药
propanediol 丙二醇
propionic acid 丙酸
psychoactive agent 对精神起显著作用药
pump 泵
purified 纯净的
pyrazinamide 吡嗪酰胺

Q

QSAR 定量构效关系
quaternary ammonium 季胺
quinazoline 喹唑啉
quinidine 奎尼丁
quinolone 喹诺酮

R

random screening in drug discovery 药物发现的随机筛选
rare earth metal salts 稀有土金属
rational approach in drug design 合理药物门
rational design 合理设计
receptor 受体

reversible 可逆的
ring closing or opening 闭环或开环

S

salicyl alcohol 水杨醇
salicylate 水杨酸盐
salicylic acid 水杨酸
salt 盐
selenium sulfide 硫化硒
semi-synthetic 半合成的
silica gel 硅胶
silicon compound 硅化物
silicon dioxide 二氧化硅
silver nitrate 硝酸银
simplification 简化
slow channel 慢道
smooth muscle 平滑肌
soft drugs 软药
solubilizing agent 增溶剂
solvent 溶剂
sorbic acid 山梨酸
specificity 特异性
spectrum of activity 作用谱(作用范围)
stability 稳定性
stereochemical 立体化学的
steric 空间(排列)的
steric constant 立体参数
sterochemistry of acetylcholine 乙酰胆碱立体化学
steroid 甾体
streptomycin 链霉素
structure-activity relationship 构效关系
sublimed sulfur 升华硫
succinylcholme 琥珀酰胆碱
succinonitrile 琥珀腈
sulfide 硫化物
sulfonamides 磺酰胺类
sulfone 砜
sulfonic acid 磺酸
sulfonylureas 磺酰脲类
sulfur 硫
sunscreen 防晒
surfactant 表面活性剂
synthesis 合成

T

tartaric acid 酒石酸
tetracyclines 四环类
thermodynamic activity 热力学活性
thienamycin 硫霉素
thiol 巯基
topical 表面的
trichloroethylene 三氯乙烯
tricyclic 三环的
triphenylmethane 三苯甲烷

U

unsaturated 不饱和
urea 脲

V

vapor pressure 蒸气压
vasodilator 血管扩张剂
vinylpyrimidine 丁吡

W

water for injection 注射用水
water for irrigation 冲洗用水
white lotion 白色洗液
white ointment 白色软膏

X

X-ray diffraction　X线衍射

xylose　木糖

Y

yellow ferric oxide　黄色氧化铁

Z

zinc　锌

1.2 药物化学专业文章

·Special Articles for Medicinal Chemistry

Text One

Some Aspects of Medicinal Chemistry Today

Ⅰ. THE SCIENTIFIC ASPECT

The term "drug" describes biologically active molecules such as xenobiotics[1] (foreign or exogenous chemicals used therapeutically against human, animal, and plant diseases), metabolic inhititors, pesticides and insecticides, or even physiologically acting compounds (such as endorphins[2], plant poisons, snake venoms[3]). They induce many more or less interdependent biological actions. Generally speaking, the chemical properties of compounds and, hence, the structures determine the mechanism of biological actions. When dealing with thousands of drugs, it becomes necessary to organize the large body of structure-activity relationships (SARs). In 1975, the relationship between theoretical medicine (pharmacology, toxicology, biochemistry), physical chemistry, and *multidimensional* mathematics and statistics was called "pharmacochemistry". One goal of pharmacochemistry is to reduce data to a few quantitative structure-activity relationships (QSARs). This is the *intellectual* aspect of the probabilistic[4] QSAR game. A second goal is to develop an understanding of SARs: for instance, a mechanistic interpretation of molecular drug-receptor interactions. This is the *rational* aspect of the QSAR game and should not be overlooked. Third, QSAR also is a method to improve the probability of discovering novel drugs within a series of closely related compounds without an enormous capital outlay, to reduce synthesis cost, and to make a plan of research. This is the *commercial* aspect. Therefore, pharmacochemistry is a science in which a close connection exists between the interests of researchers in how chemicals influence nature and the technological achievement of their ideas. There is no other science where creativity of researchers may lead to so large an improvement in human health and food technology.

Needless to say, the *absence of QSARs* can only be due to the multiplicity[5] and

complexity of SARs as a whole, or deficient methods of investigation (experimental bioassay, physicochemical constants, statistical approaches).

The establishment of a mathematically oriented *unidimensional QSAR* is now in the last of four stages: enthusiasm, initial stabilization, disappointment, and final stabilization. The large body of successful QSARs has encouraged the drug designer to use unidimensional QSAR approaches that are now routine, and enthusiasm for mathematically oriented medicinal chemistry seems to be quite understandable. The practical success of such semitheoretical (or semiempirical) techniques should not be overlooked, because it is not yet possible to design drugs in a purely logical and theoretical fashion; each kind of QSAR could be regarded as "making the best of a bad job". An *ab initio* drug design is currently not feasible and will not become so in the near future, and the lion's share of spectacular and brandnew developments has become almost entirely from pharmacological screening tests. To a large degree, the research is still empirical, especially because of the lack of absolute ways to describe the molecules physicochemically. Further, drug action is highly complex in nature, and formal description of *multidimensional* processes is rather difficult to realize. Nevertheless, mathematical methods are becoming an increasingly vital link in developing safer chemicals. Based on multivariate QSARs, the *probability* of successfully developing less toxic but more potent congeners[6] of drugs increases. Therefore, it must borne in mind that QSAR is a game of probabilities. Perfect correlations between chemical structure and biological activity can never be expected and are not necessary to obtain insight into the tendency of SARs. Because of the probabilistic character, *outliers* also may be expected. These may often represent the existence of a particular effect that can provide large increases in biological activity. And outliers are more interesting, in general, than those members of a closely related series of compounds that are well recognized or fitted. Eventually, outliers can be included in a more global QSAR model by including additional physicochemical terms.

Before any QSAR can be made, it is quite clear that the parameters reflecting the complex behavior of drugs *in vitro* and in living animals must be determined experimentally. Therefore, the study of *biosystems* requires sufficient insight into the nature and limitations of biological starting material, too. It should be self-evident that equally high demands can be made on expressions of biological activity as on mathematical tools with which these date are processed, *since the results cannot be more reliable than this starting material* and the physicochemical terms.

Classical methods of *communications* depend on regularly covering a few periodicals or attending a few scientific meeting each year. These methods are no longer adequate to cope with the growing flood of scientific information. Only modern

information services and data-bank programs can help to solve the problem. Multivariate approaches in this field reflect a real progress and advantage because, for example, hierarchical[7] classification of information becomes possible. The type of information that is then needed is typed into the desk computer on a typewriter-like terminal, and title and abstracts are immediately printed at the terminal or displayed on a video screen. In addition to pharmacological-toxicological data banks, synthesis-route discovery programs using a reaction library and methods of artificial intelligence allow computer users to obtain information on, say, which of the compounds are relatively easy and which are difficult or impossible to synthesize. The intermediates of various synthesis routes are often biologically active and could be useful leads for new substances.

Ⅱ. THE MULTIDIMENSIONAL VIEW

It is now widely accepted that the multidimensional view of data analysis can serve as a useful tool in solving problems in medicinal chemistry, although *there seems to be little consensus on what type of approach is the most appropriate. And in specific applications to drug design, there may be considerable debate on whether a particular proceudure is the adequate one*. It is not within the scope of this book to argue the pros and cons: the goals here are to give the theoretical assumptions made by mathematicians in the process of deriving the theoretical "backbone" of multivariate techniques; to describe, in terms as nonmathematical as possible, a set of such methods having value from the (subjective) author's standpoint; and to illustrate the different designs by numerical examples. After presenting a multivariate view, I leave it to the reader to decide on a preferred approach. It should also be emphasized that during the years since the first publications of multivariate methods in the late 1920s, considerable progress has taken place in multidimensional methodology. Obviously, not all the developments can be described, and some must be excluded, such as factor analysis; *we mainly focus our attention on techniques that are based on the general linear multivariate hypothesis*. According to Popper, we also do not strictly distinguish between theory and practical application.

Among many other indications, one expression of the multidimensional nature of drug action is its dependence on biorhythmic phenomena. For example, when the drug concentration in plasma must be maintained at a minimal effective level, an oscillatory[8] multicompartment biosystem with inputs, outputs, and constraints must be considered, including controllability, observability, and system stability criteria. The experimental analysis is rather difficult, but such questions can be resolved only through multidimensional approaches.