全国大学医学英语统编系列教材

医学英语（基础医学）

English for Medical Purpose

(Basic Medicine)

白永权　主审　孙庆祥　主编

復旦大學出版社

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PREFACE 前言

普通英语(English for General Purpose, EGP)正逐渐从中国大学英语教学中淡出,大学英语的教学重心正在转向专门用途英语(English for Specific Purpose, ESP),并将很快成为大学英语教学的主流。全国各大医学院校也逐渐开设医学英语(English for Medical Purpose, EMP)课程。本教材以国内大学英语教学的这种变革为背景,顺应了大学英语从普通英语向学术英语、专业英语转向的契机,编写时注重专业内容与语言知识有机结合,既有医学知识的专业深度,又有人文思辨的广度。

本教材内容

《医学英语(基础医学)》全书由10个单元组成,除了第10单元以医学新动向(New Orientations in Medicine)为主题外,其他9个单元分别以基础医学教学中最主要的学科为主题,包括细胞生物学(Cell Biology)、胚胎学(Embryology)、生理学(Physiology)、免疫学(Immunology)、神经学(Neuroscience)、病理学(Pathology)、微生物学(Microbiology)、医学影像(Medical Imaging)和药物学(Pharmacology)。内容系统全面,涵盖了现代医学中最主要的基础学科。

每个单元的内容各具特色,自成体系,分别包括以下内容。

Part I Building Blocks of Medical Terminology

介绍在本单元出现并在医学英语构词中经常使用的构词成分,配有填字练习(criss-cross)以帮助记忆这些成分。把填字练习引入教材和教学,这也是国内所有英语教材的首创,实践了寓学于乐的教学思想。

Part II Text A

Text A选材来自国外出版的原版教材,内容专业、语言地道。在课文后面附有词汇注音和解释,对疑难之处做了详细的注释。同时,还配有3种练习,其中第1种练习为学生的口述报告(presentation),这样可以充分发挥学生的自主性(autonomy),把教与学有机结合起来。第2种练习为知识性填空,真正实现通过掌握知识学习语言知识(content-based learning)。第3种练习为术语练

习,目的是让学生尽可能多地掌握相应的术语表达,因为术语是ESP的重要组成部分,也是其一大特点,是学习者必须掌握的内容。

Part III Text B

与Text A不同,Text B是与医学人文、背景知识、社会医学等相关的材料,但是都与本单元主题紧密相关;选材来源更加广泛,大多数来自权威医学杂志,其中部分来自权威机构的官方网站。

在编排上,Text B后面也有词汇和详细注解,并配有两种练习。第1种练习是传统的阅读理解题,根据文章篇幅长短配有5~7题。第2种练习是深入讨论题,给学生锻炼英语思维能力、练习口语表达提供了极好的切入点和机会。

Part IV Language Skill Development

由两部分内容构成:视听和语言组块(language chunks)练习。视听部分精心挑选与本单元内容紧密相关的一段时长为3~5分钟的视频片段,并配有各种练习,如note-taking, summary, true or false question, comprehension question, blank filling等。视听部分的主要目的是让学生通过不同的媒介对所学内容做进一步了解,并提高视听语言能力。

语言组块练习精心挑选了本单元Text A和B中出现的一些常见的语言组块做进一步的强化和记忆,这也是本书的一大亮点。

本教材特点

1. 选材权威:本教材以基础医学教学中最主要的学科设置为依托,针对性强,系统全面,细分合理,内容丰富、权威。

2. 既专又宽:本教材编排中,Text A的内容专业性较强,涉及基础医学教学中最主要的内容。为了让教材不仅"有深有专",还要"有宽有广",所以Text B的选材比较灵活,内容涉及面广,有医学人文、历史背景、人物故事、社会医学等,通过阅读学习这些富有哲理、思辨性极强的文章,拓展学生的视域,提高他们将来作为"社会性"医学科学工作者的意识。

3. 真人录音:对于很多学生,甚至包括老师来说,医学术语的读音是一个难点。为了破解这个难题,我们请经验丰富的专家对每个单元词汇表中所列的单词进行录音,从而帮助学生解决对医学术语会看不会说的问题。

4. 读视结合:除了2篇阅读材料之外,本教材每个单元在Part IV语言技能发展中精选了与本单元内容紧密相关的一段时长为3~5分钟的视频片段,并配以多种形式的练习,以提高学生的视听语言能力。

5. 主动参与:现代教学理念强调学生的参与和自主性,为了不让课堂变成"一言堂",使大学英语教学从由老师主导的填鸭式(teacher-dominated spoonfeeding)转向以学生为中心的启发式(student-centered heuristics),本教材设计编排了2种特色练习。第1种是Text A后面的口头陈述报告(presentation),可以事先安排学生对相关内容做准备,上课时由学生穿插讲述这些内容,然后由老师做补充和点评。这样的课堂互动会大大调动学生的学习积极性和参与度,活跃课堂气氛,提高学生的学习效率和语言使用能力。第2种练习是

Text B 后面的深度讨论(topics for in-depth discussion)。此练习可以在讲解课文时就相关话题进行深入探讨,也可以让部分学生事先准备,然后在课堂上进行讲解分享,还可以在完成课文讲解之后进行分组讨论。不管采取哪种形式,这种讨论会增加学生间的英语交流,促进其英语思辨和应用能力,还可以增加课堂教学形式的多样性,营造很好的语言互动环境。

6. 寓学于乐:有关游戏在语言教学中使用的研究报道不少,但是国内英语教材中真正把游戏引入的寥寥无几。本教材在构词成分的学习中巧妙编排了广受欢迎的填字练习(criss-cross),通过这种形式,促进相关内容的掌握和记忆,寓学于乐。

本教材附有光盘,光盘内有每个单元的视频和词汇表的真人读音。课文的参考译文、单元练习的答案,以及视频的文字都会收编在《医学英语(基础医学)参考用书》中。

借此机会,我们感谢为本书出版作出贡献和提供帮助的所有人。由于水平有限,书中难免会有不足或疏漏之处,欢迎读者批评指正。

孙庆祥

2015 年 8 月于复旦大学上海医学院

CONTENTS

Unit 1

Cell Biology

Part I Building Blocks of Medical Terminology

bio- 生命,生物
- **biochemistry** /ˌbaɪəʊˈkemɪstrɪ/ *n.* 生物化学

chrom(o)- 色
- **chromatin** /ˈkrəʊmətɪn/ *n.* 染色质

cyt(o)- 细胞
- **cytoplasm** /ˈsaɪtəˌplæzəm/ *n.* 细胞质

endo- 内
- **endoplasmic** /ˌendəʊˈplæzmɪk/ *a.* 内质的

eu- 真,好,佳,优
- **eukaryote** /juːˈkærɪəʊt/ *n.* 真核生物

glyc(o)- 甘,甜;葡萄糖;糖原
- **glycoprotein** /ˌglaɪkəʊˈprəʊtiːn/ *n.* 糖蛋白

-graphy 描计法,记录法,照相术
- **chromatography** /ˌkrəʊməˈtɒgrəfɪ/ *n.* 色谱法,层析

hydr(o)- 水
- **hydrophobic** /ˌhaɪdrəʊˈfəʊbɪk/ *a.* 疏水的;狂犬病的;恐水的

-ics ……学
- **genetics** /dʒɪˈnetɪks/ *n.* 遗传学

intra- 内,内部
- **intracellular** /ˌɪntrəˈseljʊlə(r)/ *a.* 细胞内的

micr(o)- 微,细,小
- **microtubule** /ˌmaɪkrəʊˈtjuːbjuːl/ *n.* 微管

pro- 前,原
- **prokaryote** /prəʊˈkærɪəʊt/ *n.* 原核生物

-some	体,躯体
lysosome /ˈlaɪsəsəʊm/ *n.*	溶酶体
-scope	……(检查)镜
microscope /ˈmaɪkrəskəʊp/ *n.*	显微镜

Task 1.1

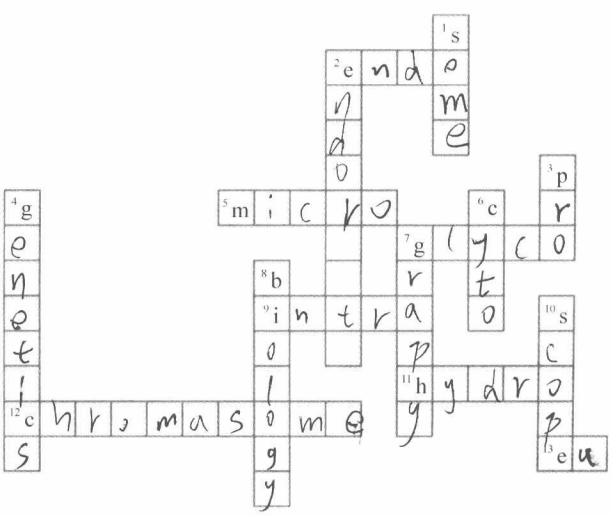
Directions: Work out the criss-cross puzzle with your partner(s).

Across

2. a word-building block, meaning "inside, within"
5. a word-building block, meaning "small or minute"
7. a word-building block, meaning "sugar"
9. a word-building block, meaning "inside, within"
11. a word-building block, meaning "water"
12. 染色体
13. a word-building block, meaning "good, well, true"

Down

1. a word-building block, meaning "body"
2. 真核生物
3. a word-building block, meaning "前,原"
4. the branch of biology that deals with heredity 遗传
6. a word-building block, meaning "cell"
7. a word-building block, meaning "描计法,照相术"
8. the science of life and of living organisms
10. a word-building block, meaning "an instrument for observing, viewing, or detecting"



Part II Text A

Cell Biology[1]

INTRODUCTION

All living things are made of cells: small, membrane-enclosed units filled with a concentrated aqueous solution of chemicals and endowed with the extraordinary ability to create copies of themselves by growing and dividing in two. Cells are the fundamental units of life, and it is to cell biology that we must look for an answer to the question of what life is and how it works.

Modern cell biology involves the weaving together of three distinctly different strands into a single cord. The first of these historical strands is cytology, which is concerned primarily with cellular structure. Cytology depended heavily on the light microscope for its initial impetus. The advent of electron microscopy and several related optical techniques has led to considerable additional cytological activity and understandings.

The second strand represents the contributions of biochemistry to our understanding of cellular function. Especially important in this field has been the development of techniques such as ultracentrifugation, chromatography, and electrophoresis for the separation of cellular components and molecules[2]. The use of radioactively labeled compounds in the study of enzyme-catalyzed reactions[3] and metabolic pathways[4] is another very significant contribution of biochemistry to our understanding how cells function.

The third strand is genetics. Here, an especially important landmark on the genetic strand came with the demonstration that DNA (deoxyribonucleic acid) is the bearer of genetic information in most life forms, specifying the order of subunits, and hence the properties, of the proteins that are responsible for most of the functional and structural features of cells. Recent accomplishments on the genetic strand include the sequencing of the entire genomes of mammals.

EUKARYOTIC AND PROKARYOTIC CELLS

Not all cells are the same. In particular, all eukaryotes (protists, plants, fungi, and animals) differ in important ways from the two extensive groups of prokaryotes (eubacteria and archaea). Two features distinguish eukaryotic and prokaryotic cells: all eukaryotic cells having a compartmentalized cytoplasm (consisting of organelles including a nucleus) and a cytoskeleton.

Eukaryotic cells are compartmentalized. A plasm membrane surrounds all cells, and additional intracellular membranes divide eukaryotes into compartments, each with a characteristic structure, biochemical composition, and function. The nuclear envelope separates the two major compartments: nucleoplasm and cytoplasm. The chromosomes

carrying the cell's genes and the machinery to express these genes reside inside the nucleus; they are in the cytoplasm of prokaryotes. Most eukaryotic cells have endoplasmic reticulum (the site of protein and phospholipid synthesis), a Golgi apparatus[5] (an organelle that adds sugars to membrane proteins, lysosomal protein, and secretory proteins), lysosomes (a compartment for digestive enzymes), peroxisomes (containers for enzymes involved in oxidative reactions), and mitochondria (structures that convert energy stored in the chemical bonds of nutrients into ATP).

Compartments give eukaryotic cells a number of advantages. The membranes provide a barrier that allows each type of organelle to maintain novel ionic and enzymatic interior environments.

Eukaryotic cells also have a cytoskeleton. Three protein polymers — actin filaments[6], microtubules, and intermediate filaments[7] — form a viscous and elastic cytoplasmic matrix to provide mechanical support for the cell.

EUKARYOTIC CELLULAR ORGANIZATION AND FUNCTIONS

Nucleus

The nucleus stores genetic information in extraordinary long DNA molecules called chromosomes. Surprisingly, genes make up only a small fraction (5%) of the 3 billion nucleotide pairs[8] in human DNA, but more than 50% of the 97 million nucleotide pairs in a nematode worm. Most of the remaining DNA has no known function, although regions called telomeres stabilize the ends of chromosomes and centromeres ensure the distinction of chromosomes to daughter cells when cells divide. The DNA and its associated proteins are called chromatin. Interactions with histones and other proteins fold each chromosome compactly enough to fit inside the nucleus. During mitosis, chromosomes condense further into separate structural units that one can observe by light microscopy.

Cell Cycle

Cellular growth and division are regulated by an integrated molecular network consisting of protein kinases, specific kinase inhibitors, transcription factors, and highly specific proteases. When conditions inside and outside a cell are appropriate for cell division, changes in the stability of key proteins trigger a chain of events leading to DNA replication and cell division.

Ribosomes and Protein Synthesis

Ribosomes catalyze the synthesis of proteins using the nucleotide sequences of messenger RNA molecules to specify the sequence of amino acid.

Endoplasmic Reticulum

The endoplasmic reticulum is a continuous system of flattened membrane sacs and tubules that is specialized for protein processing and lipid biosynthesis.

Golgi Apparatus

The Golgi apparatus processes the sugar side chains of secreted and membrane

glycoproteins and sorts the proteins for transport to other parts of the cell. The Golgi apparatus is a stack of flattened, membrane-bound sacs with many associated vesicles.

Lysosomes

An impermeable membrane separates degradative enzymes inside lysosomes from other cellular components. Membrane vesicles, called endosomes and phagosomes, deliver ingested microorganisms and other materials destined for destruction to lysosomes.

Plasma Membrane

The plasma membrane is the interface of the cell with its environment. Owing to the hydrophobic interior of its lipid bilayer, the plasma membrane is impermeable to ions and most water-soluble molecules. Consequently, they only cross the membrane through transmembrane channels, carriers, and pumps, which provide the cell with nutrients, control internal ion concentrations, and establish a transmembrane electrical potential[9].

Mitochondria

Mitochondrial enzymes convert most of the energy released from the breakdown of nutrients into the synthesis of ATP, the common currency for most energy-requiring reactions in cells. Mitochondria also have a key role in cellular responses to toxic stimuli from the environment. In response to drugs such as many used in cancer chemotherapy, mitochondria release into the cytoplasm a toxic cocktail of enzymes and other proteins that brings about the death of the cell. Defects in this form of cellular suicide, known as apoptosis, lead to autoimmunity, cancer, and some neurodegenerative diseases[10].

Peroxisomes

Peroxisomes are membrane-bound organelles containing enzymes that participate in oxidative reactions. Genetic defects in peroxisomal biogenesis cause several forms of mental retardation[11].

Cytoskeleton and Motility Apparatus

A cytoplasmic network of three protein polymers — actin filaments, intermediate filaments, and microtubules — maintain the shape of a cell, each polymer having distinctive properties and dynamics. Actin filaments and microtubules also provide tracks for the ATP-powered motor proteins that produce most cellular movement, including cellular locomotion, muscle contraction, transport of organelles through the cytoplasm, mitosis, and the beating of cilia and flagella.

(1,041 words)

New Words and Expressions

membrane /ˈmembreɪn/ *n.* 膜

enclose /ɪnˈkləʊz/ *vt.* 封闭;包围

aqueous /ˈeɪkwɪəs/ *a.* 水的,含水的
solution /səˈljuːʃən/ *n.* 溶液
endow /ɪnˈdaʊ/ *vt.* 给予,赋予
strand /strænd/ *n.* 线
cytology /saɪˈtɒlədʒɪ/ *n.* 细胞学
cellular /ˈseljʊlə(r)/ *a.* 细胞的
advent /ˈædvənt/ *n.* 到来,出现
electron /ɪˈlektrɒn/ *n.* 电子
microscopy /maɪˈkrɒskəpɪ/ *n.* 显微镜检查
optical /ˈɒptɪkəl/ *a.* 光学的,视觉的
ultracentrifugation /ˈʌltrəˌsentrɪfjʊˈgeɪʃən/ *n.* 超速离心法
electrophoresis /ɪˌlektrəfəˈriːsɪs/ *n.* 电泳
molecule /ˈmɒlɪkjuːl/ *n.* 分子
radioactively /ˌreɪdɪəʊˈæktɪvlɪ/ *ad.* 放射性地
enzyme /ˈenzaɪm/ *n.* 酶
catalyze /ˈkætəlaɪz/ *vt.* 催化
metabolic /ˌmetəˈbɒlɪk/ *a.* 新陈代谢的
deoxyribonucleic acid /diːˈɒksɪraɪbəʊnjuːˈkleɪɪk ˈæsɪd/ 脱氧核糖核酸(略作 DNA)
protein /ˈprəʊtiːn/ *n.* 蛋白质
sequence /ˈsiːkwəns/ *v.* 测序
n. 序列
genome /ˈdʒiːnəʊm/ *n.* 基因组
eukaryotic /juːˌkærɪˈɒtɪk/ *a.* 真核的,真核生物的
prokaryotic /prəʊˌkærɪˈɒtɪk/ *a.* 原核的
protist /ˈprəʊtɪst/ *n.* 原生生物
fungus /ˈfʌŋgəs/ *n.* 真菌;【复数】fungi /ˈfʌŋdʒaɪ/
eubacterium /ˌjuːbækˈtɪərɪəm/ *n.* 真菌属;【复数】eubacteria /ˌjuːbækˈtɪərɪə/

archaeon /ɑːˈkɪɒn/ *n.* 古细菌;【复数】archaea /ɑːˈkɪə/
organelle /ˌɔːgəˈnel/ *n.* 细胞器官
nucleus /ˈnjuːklɪəs/ *n.* 细胞核
cytoskeleton /ˌsaɪtəʊˈskelɪtən/ *n.* 细胞骨架
plasm /ˈplæzəm/ *n.* 原生质
nucleoplasm /ˈnjuːklɪəplæzəm/ *n.* 核质
chromosome /ˈkrəʊməsəʊm/ *n.* 染色体
reticulum /rɪˈtɪkjʊləm/ *n.* 网状组织
phospholipid /ˌfɒsfəʊˈlɪpɪd/ *n.* 磷脂
synthesis /ˈsɪnθɪsɪs/ *n.* 合成

apparatus /ˌæpəˈreɪtəs/ *n.* 器官
lysosomal /ˌlaɪsəˈsəʊməl/ *a.* 溶酶体的
secretory /sɪˈkriːtərɪ/ *n.* 分泌的
digestive /dɪˈdʒestɪv/ *a.* 消化的
peroxisome /pəˈrɒksɪsəʊm/ *n.* 过氧物酶体
oxidative /ˈɒksɪdeɪtɪv/ *a.* 氧化的
mitochondrion /ˌmaɪtəʊˈkɒndrɪən/ *n.* 线粒体;【复数】mitochondria /ˌmaɪtəʊˈkɒndrɪə/

bond /bɒnd/ *n.* 键
nutrient /ˈnjuːtrɪənt/ *n.* 营养物
ATP *abbr.* 三磷酸腺苷(adenosine triphosphate /əˈdenəsɪn traɪˈfɒsfeɪt/)

ionic /aɪˈɒnɪk/ *a.* 离子的
enzymatic /ˌenzaɪˈmætɪk/ *a.* 酶的
polymer /ˈpɒlɪmə/ *n.* 聚合物
actin /ˈæktɪn/ *n.* 肌动蛋白
filament /ˈfɪləmənt/ *n.* 细丝
viscous /ˈvɪskəs/ *n.* 黏的,黏稠的
elastic /ɪˈlæstɪk/ *a.* 有弹性的
matrix /ˈmeɪtrɪks/ *n.* 基质
nucleotide /ˈnjuːklɪətaɪd/ *n.* 核苷酸
nematode /ˈnemətəʊd/ *a.* 线虫类的
telomere /ˈteləmɪə/ *n.* 端粒
centromere /ˈsentrəmɪə/ *n.* 着丝粒,着丝点
histone /ˈhɪstəʊn/ *n.* 组蛋白
mitosis /maɪˈtəʊsɪs/ *n.* 有丝分裂
kinase /ˈkaɪneɪz/ *n.* 激酶
inhibitor /ɪnˈhɪbɪtə(r)/ *n.* 抑制剂
transcription /trænˈskrɪpʃən/ *n.* 转录
protease /ˈprəʊtɪeɪs/ *n.* 蛋白酶
replication /ˌreplɪˈkeɪʃən/ *n.* 复制
ribosome /ˈraɪbəsəʊm/ *n.* 核蛋白体;核糖体
RNA *abbr.* 核糖核酸(ribonucleic acid /ˌraɪbəʊnjuːˈkliːɪk ˈæsɪd/)

amino /əˈmiːnəʊ/ *a.* 氨基的
sac /sæk/ *n.* 囊;液囊
tubule /ˈtjuːbjuːl/ *n.* 小管,细管
lipid /ˈlɪpɪd/ *n.* 脂肪

biosynthesis /ˌbaɪəʊˈsɪnθɪsɪs/ *n.* 生物合成
stack /stæk/ *n.* 堆
vesicle /ˈvesɪkl/ *n.* 泡;囊
impermeable /ɪmˈpɜːmɪəbl/ *a.* 透不过的;不能渗透的
degradative /ˈdegrədeɪtɪv/ *a.* 降解的
endosome /ˈendəsəʊm/ *n.* 内体,核内体
phagosome /ˈfægəsəʊm/ *n.* 吞噬体
ingest /ɪnˈdʒest/ *vt.* 摄取;吸收
microorganism /ˌmaɪkrəʊˈɔːgənɪzəm/ *n.* 微生物
bilayer /ˈbaɪleɪə(r)/ *n.* 双分子层(膜)
soluble /ˈsɒljʊbl/ *a.* 可溶解的
transmembrane /ˌtrænsˈmembreɪn/ *a.* 跨膜的
pump /pʌmp/ *n.* 泵
chemotherapy /ˌkeməʊˈθerəpɪ/ *n.* 化学疗法
apoptosis /ˌæpəpˈtəʊsɪs/ *n.* 细胞凋亡
autoimmunity /ˌɔːtəʊɪˈmjuːnətɪ/ *n.* 自身免疫
neurodegenerative /ˌnjʊərəʊdɪˈdʒenərətɪv/ *a.* 神经变性的
peroxisomal /pəˈrɒksɪsəʊməl/ *a.* 过氧化物酶体的
biogenesis /ˌbaɪəʊˈdʒenɪsɪs/ *n.* 生物起源,生物发生
retardation /ˌriːtɑːˈdeɪʃən/ *n.* 迟缓;阻滞
locomotion /ˌləʊkəˈməʊʃən/ *n.* 运动;移动
cilium /ˈsɪlɪəm/ *n.* 纤毛;【复数】cilia /ˈsɪlɪə/
flagellum /fləˈdʒeləm/ *n.* 鞭毛;【复数】flagella /fləˈdʒelə/或 flagellums

Notes

1. The text is adapted from Chapter 1 in *Cell Biology* (Thomas D. Pollard et. al., 2004) and Part 1 in *The World of the Cell*(4th Edition, Wayne M. Becker et. al., 2000).
2. **Especially important in this field has been the development of techniques . . .** | 此句为倒装句,因为主语太长,把表语"Especially important in this field"提前,使句子平衡。
3. **enzyme-catalyzed reaction** | 酶促反应
4. **metabolic pathway** | any of the sequences of biochemical reactions, catalysed(催化) by enzymes, that occur in all living cells 代谢途径
5. **Golgi apparatus** | a cell organelle, composed of layers of flattened sacs, that processes proteins and moves some of them out of the cell; also called Golgi body, Golgi complex 高尔基器(亦称高尔基体、高尔基复合体)
6. **actin filament** | 肌动蛋白丝
7. **intermediate filament** | 中间丝