

全国高等医学院校检验专业本科教材

英 语

ENGLISH

主 编 杨有涛

中国医药科技出版社

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内 容 提 要

本书是根据国家教委提出的医学检验教育要大力发展的精神和全国高等医学院校检验专业校际会议决定,由蚌埠医学院牵头,组织全国十几所高等医学院校有关人员撰写而成,是检验专业第一部英语教材。

全书共分 40 课,40 余万字,每课含有课文、词汇、词组、课文注释、练习和补充阅读材料。本教材突出实用性及专业化。适用于医学检验专业本科学生和教师使用,亦可供医学检验专业全日制专科选用,并可供临床检验人员、检验专业教师参考。

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序 言

医学检验专业是医学领域中一个重要的、较新的分支。它作为一个专业,建立时间还不长,但发展甚为迅速,对医学事业的发展、医疗水平的提高及人类疾病的防治,越来越显示出重要作用。临床检验工作的手段日新月异,以较快的步伐向免疫生化学、分子生物学、遗传基因技术等尖端领域渗透,新的信息量大,需要人们不断掌握运用,提高检验水平。

高等医学院校临床检验专业本科的学生在学习了基础英语后,在校期间应不断补充专业英语的知识,以便在毕业后的工作中较快地掌握业务和提高专业能力。专业英语有其与基础英语不同的地方,要能够初步掌握并阅读、翻译,至少需有几年时间的不懈努力。这就要求有一本较好的教材。高等医学院校检验专业的教材现处于刚起步的状态,已编写和出版的本科和专科教材还很少,而专业英语的教材则更少。杨有涛副教授主编的英语教材是由英语教师和检验专业人员相结合编写完成的,既符合语言学的要求,也提供临床检验专业各科的知识,不但可供医学检验专业学生应用,也可作为检验工作人员的自学材料,将有助于医学检验事业的发展。

白功懋

1990年8月

前 言

根据国家教委提出的医学检验专业教育要大力发展的精神和全国高等医学院校检验专业校际会议决定编写全国高等医学院校检验专业系列教材的要求,由蚌埠医学院牵头,组织全国十所高等医学院校有关人员撰写成此书。这是检验专业本科第一部英语教材。

本书共分 40 课,40 余万字,教学时数 140 时左右,作为检验专业本科学生英语教学的后续教材,亦可供专科选用。

该书的内容,主要从近期出版的检验专业原版书中节选的。其课文内容以临床检验、生物化学、细菌、免疫、血液、寄生虫等学科为主;课文的选择侧重于实用性和专业化;除课文、词汇、词组、注释外,还配有大量练习及补充阅读材料,以便对所学的内容加以熟练和巩固。

由于编者水平所限,加以对检验专业英语教材尚属初次撰写,难免有考虑欠妥之处,敬请广大师生在使用本教材过程中提出宝贵意见,以利于今后进一步修改。

高等医学院校检验专业本科英语
教材编写组

1990. 8

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Lesson One

Discovery of the Erythrocyte and Early Study

“Small round globules” were described in human blood by the Dutch microscopist, Leeuwenhoek in 1673, but the “ruddy globules” were probably first observed by Swammerdam fifteen years earlier. Malpighi (1665) mistook them for “fat globules” looking like a rosary of red coral. Leeuwenhoek made a thorough study of these red bodies, and attributed the color of blood to them.

One hundred years later, William Hewson recognized that these red particles are really flat discs rather than globules and suggested that they “must be of great use” in the body economy. The presence of iron in blood was demonstrated by Menghini in 1747, and Funke isolated hemoglobin in crystalline form in 1815. It was not, however, until 1867 that Hopper-Seyler demonstrated that hemoglobin has the property of readily taking up and discharging oxygen. It was then that the functional significance of hemoglobin and of particles in which it is carried, became clear.

During the latter half of the nineteenth century many studies of the erythrocyte were made. Vierordt (1852) and Welcker (1854) made first blood counts. Their laborious technic was considerably improved by the invention of the counting chamber and diluting pipet. At the same time, attention was given to methods for measuring the coloring matter of the blood. Vierordt devised a spectroscopic method and Welker described a colorimetric method. In the first monograph on hemoglobin, Preyer in 1871 referred to several spectroscopic, chemical and colorimetric methods.

Neumann, in 1868, demonstrated that red corpuscles are formed in bone marrow, arising there from colorless, nucleated elements. With the introduction of the anilin dyes which followed Ehrlich's studies of 1877 and later, the morphological study of the blood and tissues received attention. At the same time interest was aroused in the variations in the size and hemoglobin content of erythrocytes in anemia and in methods for their measurement.

New Words and Expressions

erythrocyte [i'riθrəusait] n.

Dutch [dʌtʃ] n. a.

ruddy ['rʌdi] a.

coral ['kɒrəl] n.

demonstrate ['demonstreit] vt.

crystalline ['kristəlain] a.

laborious [lə'bo:riəs] a.

红细胞

荷兰人, 荷兰的

红的

珊瑚

证实, 证明

结晶的, 晶状的

费力的, 勤勉的

diluting [dai'ljʊ:tɪŋ] a.	稀释的
devise [di'vaiz] vt.	设计,发明
colorimetric ['kʌləri'metrik] a.	比色法的
bone marrow ['mæəu]	骨髓
globule ['glɒbjʊ:l] n.	小球,血细胞
microscopist [mai'krɒskəpɪst] n.	显微镜学家
fat [fæt] n.	脂肪;a. 脂肪的
rosary ['rəʊzəri] n.	蔷薇冠t,念珠
thorough ['θʌrə] a.	彻底的,全面的
particle ['pɑ:tɪkl] n.	颗粒,微粒
disc [disk] n.	盘状物,圆盘
suggest [sʌ'dʒest] vt.	提示,暗示
isolate ['aɪsəleɪt] vt.	使分离,隔离
hemoglobin [hi:məu'gləubɪn] n.	血红蛋白
property ['prɒpəti] n.	性能,特征
readily ['redɪli] ad.	容易地,很快地
discharge [dis'tʃɑ:dʒ] vt.	释放,排出
significance [sig'nɪfɪkəns] n.	重要性,意义
count [kaunt] n.	计数,vt. 计算
chamber ['tʃeɪmbə] n.	室,池,腔
counting chamber	计数室
pipet ['pi'pet] n.	吸量管
measure ['meʒə] vt.	测量,计量
spectroscopic ['spektrə'skɒpɪk] a.	分光镜检查的,分光镜的
monograph ['mɒnəʊgrɑ:f] n.	专题论文,专著
red corpuscle ['kɒ:pəsl] n.	红细胞
arise [ə'raɪz] vi.	出现,发现
anilin ['ænilɪn]-n.	苯胺
dye [dai] n.	染料;vi,染色
tissue ['tɪʃu:]n.	组织
arouse [ə'raʊz] vt.	引起,激发
content ['kɒntent] n.	含量,容量
nucleated ['nju:kli:teɪtɪd] a.	有核的
morphological [mɔ:fə'lɒdʒɪkəl] a.	形态学的
variation [veəri'eɪʃən] n.	变化,变异演化
anemia [ə'ni:mɪə] n.	贫血症
mistake...for	把……误认为……
make a study of	研究
arise from...	产生于……,因……而发生

Leeuwenhoek ['leiwenhøk]—荷兰人,十七世纪最著名的显微镜学家。

Swammerdam ['swæmədæm]—荷兰博物学家,首先发现并描述红细胞

William Hewson ['wiliəm'hju:sən]—英国解剖学家,生理学家。

Menghini [men'dʒini]—意大利医学家。

Funke [fʌŋk]—生于波兰之美国生物化学家。

Hoppe-Seyler ['həup'seɪlə]—德国生理学家。

Vierordt [viə'rɔ:t]—德国医学教授,设计血细胞计数、血压测量技术等。

Welcker ['welkə]—德国医学家。

Preyer ['preiə]—德国生理学家。

Neumann ['nɔimɑ:n]—德国病理学家,发现骨髓内的有核红细胞。

Ehrlich ['ɛəlɪʃ]—德国医学,血液学,免疫学奠基人之一。

Notes

1. ...rather than globules and suggested that they "must be of great use" in the body

红细胞是扁平的...而不是球体,提示它们在人体中“一定有极大的用处”。

(1) rather than 而不是,与其...不如...,与其...勿宁...

e. g. The color seems green rather than blue.

那个颜色好象是绿的而不是蓝的。

(2) be of great use = be very useful

相应的结构:

e. g. be of great importance 极为重要

2. It was not, however, until 1867 Hoppe-Seyler demonstrated that hemoglobin has the property of readily taking up and discharging oxygen.

然而,直到 1867 年霍普-塞勒才证明血红蛋白具有易于摄取并释放氧的特性。

本句属于强调句型

(1) It is(was) + 被强调部分 + that...

eg. ① I met your brother in the zoo.

② It was yesterday that I met in the zoo

It was your brother that I met in the zoo yesterday.

It was in the zoo that I met your brother yesterday

(2) not...until 直到...才,为强调句。

e. g. ① I did not see your papa until the evening.

② It was there from colorless, nucleated elements.

Exercises

(一) Choose the best answer for each of the following according to the text.

1. "Small round globules" and "ruddy globules" in fact all indicate _____.

- (1) fat globules
- (2) hemoglobin
- (3) erythrocyte
- (4) iron in blood

2. Swammerdam first observed the "ruddy globules" in _____.

- (1) 1673
- (2) 1665
- (3) 1658
- (4) 1747

3. Because of the presence of _____, the blood is red.

- (1) red dyes
- (2) anilin dyes
- (3) fat globules
- (4) red corpuscles

4. The property of hemoglobin is to _____ oxygen.

- (1) carry
- (2) take up
- (3) give up
- (4) keep

5. Who was the first to have observed the red corpuscles?

- (1) Leeuwenhoek
- (2) Malpighi
- (3) Funke
- (4) Swammerdam

6. When did scientists begin to understand the functional importance of hemoglobin and erythrocyte?

- (1) 1867
- (2) 1852
- (3) 1851
- (4) 1854

7. There are at least _____ methods for measuring the coloring matter of the blood, according to Preyer.

- (1) seven
- (2) five
- (3) four
- (4) three

8. Erythrocytes come from _____.

- (1) the heart
- (2) the brain
- (3) the spleen
- (4) bone marrow

(二) Find the single word in the text giving the same meaning as:

- 1. a red blood corpuscle (n.)
- 2. a red coloring matter in the blood (n.)

3. to find the size, length, amount, degree, etc. (v.)
4. the unhealthy condition of not having the proper number of red cells in the blood (v.)
5. the amount of a substance contained in something (n.)
6. like crystal or of crystal (a.)
7. to let out (v.)
8. needing great effort (a.)

(三) Match the words or phrases in column A with those in column B.

A

1. to research
2. to mention, speak about
3. to think wrongly that something or some-

body is sth. or sb.

4. to collect and become filled with
5. to believe sth. to be the result of

B

- (1) to mistake...for
- (2) to attribute...to
- (3) to make a study of

- (4) to refer to
- (5) to take up

(四) Study the following prefixes and suffixes, use each of them to form two medical words and give their Chinese meaning.

1. micro 小, 细, 微
2. mono-; mon 单, 一
3. hem-; hemo 血

(五) Fill in the blanks with the words or phrases given.

until than hemoglobin that erythrocytes

The _____ in children of all ages remain smaller _____ those of adults and it is not _____ puberty or later _____ cells of the size and _____ content of those adults are found.

(六) Translate the following into English.

1. 斯瓦姆默丹首先发现并描述了红细胞。
2. 他把成功归于运气。
3. 由于计数器和稀释吸量管的引用, 白细胞计数变得容易了。
4. 是诺伊曼证明了细胞在骨髓中形成。

(七) Supplementary reading.

Collection of Blood

Finger Puncture

Materials:

Cotton balls, 70% alcohol, sterile blood lancet

Procedure:

1. With cotton moistened with 70% alcohol, cleanse pad of finger.

2. Wipe a piece of dry cotton, thoroughly dry pad of finger.
3. Pick up a sterile blood lancet and remove wrapper.
4. With left hand, firmly grasp sterile lancet.
5. With left hand, firmly grasp patient's middle finger.
6. With a quick drop and a quick rise of lancet, make deep stab on pad of finger.
7. Take a piece of dry cotton and wipe away first drop.
8. Form a large rounded drop of blood at site of puncture.
9. Perform tests desired.
10. Place a piece of cotton on puncture until bleeding stops.

Venipuncture

Materials:

Cotton balls, 70% alcohol, tourniquet, needle (20 gauge), vacutainer tube and holder.

Procedure:

1. Assemble vacutainer shell and needle. (The diameter of a needle is given by its gauge number. The smaller the number, the greater the diameter.)
2. Apply tourniquet above bend in elbow.
3. Select vein.
4. Moisten a piece of cotton with 70% alcohol and thoroughly rub cotton on vein you have selected.
5. Select proposed point of entry into vein. Now place left thumb about 2.5cm (1 in) below this proposed point of entry. Press down firmly with thumb and pull skin toward yourself.
6. Point needle in exactly the same direction as vein is running.
7. Hold vacutainer at a 15 degree angle up.
8. Push needle firmly and deliberately into vein.
9. Withdraw blood.
10. Release tourniquet.
11. Pick up a piece of cotton and gently hold it on puncture.
12. Withdraw needle.
13. When needle is out of arm, press cotton on puncture.

Lesson Two

Estimation of Hemoglobin

Hemoglobin is a conjugated protein present in the red blood cells. It is responsible for the red color of blood. The prosthetic (nonprotein) compound combined with protein (globin) to form hemoglobin is called heme. Heme is an organic compound containing iron in chemical combination (iron, porphyrin). This iron has a valence of $+2$ (ferrous iron).

It is the function of hemoglobin to combine loosely with oxygen in the lungs and to take it to the tissues, where a part of this oxygen is released. Hemoglobin combined with oxygen is called oxyhemoglobin. Oxyhemoglobin shows three absorption bands when scanned in a spectrophotometer (absorption at a wavelength of 578, 542, and 415nm).

Methods for the determination of hemoglobin concentration of whole blood might be divided into two groups, primary and secondary methods. The primary methods are, for all practical purposes, too tedious and time consuming to be used as a routine method for hemoglobin analysis, but they have their value in that they can be used for the standardization of routine procedures (secondary methods). The properties of hemoglobin that serve in primary methods are essentially two: (1) the oxygen-combining property of hemoglobin and (2) the iron content of the hemoglobin molecule. Most of the secondary methods are based on spectral characteristics of hemoglobin or its derivatives.

Each gram of oxyhemoglobin is capable of combining with 1.34 volumes percent (vol%) of oxygen. Therefore if the oxygen capacity of blood is divided by 1.34, the quotient gives the number of grams of hemoglobin per 100 ml of blood. In fully oxygenated blood from a normal person, there will be about 20.9 vol% of molecular oxygen. Therefore an average value of 15.6 of hemoglobin is present.

Each 100 g hemoglobin contains 335 mg iron. Therefore if the iron contained in 100ml of blood is determined, and this value is divided by 3.35, the quotient equals the grams of hemoglobin per 100 ml of blood.

The blood oxygen capacity measures functional hemoglobin only and is inaccurate in that 2% to 12% of adult hemoglobin may be of an inactive form (unable to take up oxygen), which cannot be regenerated, and therefore it would not be measured by this method.

Total-blood-iron measurement for all practical purposes may be regarded as being bound to hemoglobin, the serum iron level being relatively small. Total-blood-iron analysis is considered the best method for the primary standardization of routine hemoglobin analysis.

New Words and Expressions

conjugate [ˈkɒndʒuɡeɪt] vt.	结合
prosthetic [prɒsˈθetɪk] a.	辅助
heme [hi:m] n.	血红素
porphrin [ˈpɔːfrɪn] n.	叶啉
valence [ˈveɪləns] n.	原子价, 化合价
ferrous [ˈferəs] a.	亚铁的, 含铁的
oxyhemoglobin [ˌɒksihi:məʊˈgləʊbɪn] n.	氧合血红蛋白
absorption [ˌæbˈsɔːpʃən] n.	吸收
band [bænd] n.	带
scan [skæn] vt.	扫描
spectrophotometer [ˌspektrəʊfəˈtɒmɪtə] n.	分光光度计
concentration [ˌkɒnsənˈtreɪʃən] n.	浓度, 浓缩
tedious [ˈtiːdʒəs] a.	冗长, 令人乏味的
consume [kənˈsjuːm] vt.	消费, 消耗
standardization [ˌstændədəɪˈzeɪʃən] n.	标准化
procedure [prəˈsiːdʒə] n.	步骤, 程序, 操作
molecule [ˈmɒlɪkjʊːl] n.	分子
spectral [ˈspektrəl] n.	光谱
characteristic [ˌkærɪktəˈrɪstɪk] a.	独特的, 表示……的特征
derivative [deˈrɪvətɪv] n.	衍生物
capacity [kəˈpæsɪti] n.	容量, 能力
quotient [ˈkwəʊʃənt] n.	商数
oxygenate [ˈɒksɪdʒɪneɪt] vt.	氧合
inaccurate [ɪnˈækjʊrɪt] a.	不准确的
regenerate [ˌriːdʒənəreɪt] vt.	再生
serum [ˈsɪərəm] (pl. serums or sera) n.	血清
relatively [ˈrelatɪvli] a.	相对地, 比较地
analysis [əˈnæləsɪs] (pl. analyses) n.	分析
combine with	与……相结合
be divided into	被分为……
be divided by	除以
for all practical purpose	实际上
be based on	以……为基础
be capable of	有……的能力
take up	吸收
be bound to	与……结合

Notes

1. The prosthetic (non protein) compound combined with protein (globin) to form hemoglobin is called heme.

辅助性的化合物与蛋白质结合生成血红蛋白,称为血红素。

2. It is the function of hemoglobin to combine loosely with oxygen in the lungs and to take it to the tissues, where a part of this oxygen is released.

血红蛋白的功能是在肺部氧疏松地结合,并将氧输送到组织,在组织中释放部分氧。

3. Oxyhemoglobin shows three absorption hands when scanned in a spectrophotometer (absorption at a wave length of 578, 542 and 415nm)

在分光光度计中仔细观察时,氧合血红蛋白显示出 3 条吸收光带(波长为 578, 542 和 415nm)。

4. The primary methods are, for all practical purposes, too tedious and time consuming to be used as a routine method for hemoglobin analysis, but they have their value in that they can be used for the standardization of routine procedures (secondary methods).

实际上,第一类方法过程太长,耗时太多,不能作为分析血红蛋白的常规方法,但也有其价值,因为它们可使常规过程标准化。

(1) too...to 太...而不...

be too tedious and time consuming to be used

e. g. He is too young to go to school.

(2) time consuming 消耗的时间

(3) in that 因为,起连接作用。

e. g. The pain is related to food in that it occurs about three or four hours after a meal.

5. The blood oxygen capacity measures functional hemoglobin only and is inaccurate in that 2% to 12% of adult hemoglobin may be of an inactive form (unable to take up oxygen), which can not be regenerated, and therefore it would not be measured by this method.

血液的氧容量只能测定功能性血红蛋白,而且不准确,因为成人血红蛋白 2% 至 12% 具有非活动性(不能吸收氧,)且不能还原,因此不能采用此法。

6. Total-blood-iron measurement for all practical purposes may be regarded as being bound to hemoglobin, the serum iron level being relatively small.

全血液铁含量测定,实际上测的是与血红蛋白结合的那部分铁含量,因为血清铁含量较少。

(1) being bound to hemoglobin 是动名词短语,作介词 as 的宾语。

(2) the serum iron level being relatively small 为独立分词结构,作状语,表示原因。

Exercises

(一) Choose the best answer for each of the following according to the text.

1. The iron in hemoglobin has valence of _____.

- (1) a ferrous form (2) two ferrous form
(3) three ferrous form (4) none of the above

2. The function of hemoglobin is _____ with oxygen in the lungs and to take it to the tissues.

- (1) to combine loosely (2) to combine freely
(3) to combine closely (4) to combine tightly

3. Hemoglobin combined with oxygen is called _____.

- (1) oxygen hemoglobin (2) hemoglobin containing oxygen
(3) heme (4) oxyhemoglobin

4. Methods for determination of hemoglobin concentration of whole blood might be divided into _____ groups.

- (1) three (2) two (3) four (4) five

5. The primary methods have their value _____.

- (1) because they can be used as a routine method
(2) because they can be used for the determination of hemoglobin concentration of whole blood
(3) because they can be used for the standardization of routine procedures
(4) because they are very important for practical purposes

6. Most of the secondary method are based on _____.

- (1) the primary methods
(2) characteristics of heme
(3) spectral characteristic of hemoglobin or its derivatives
(4) characteristic of oxyhemoglobin

7. Each 100g hemoglobin contains _____ iron.

- (1) 3.55mg (2) 33.5mg (3) 355mg (4) 350mg

8. Total-blood-iron analysis is regarded as the best method _____.

- (1) for the primary standardization of routine hemoglobin analysis
(2) for the practical purposes
(3) for the determination of hemoglobin concentration of whole blood
(4) for hemoglobin analysis

(二) Read the following statements and write T (true) or F (false) for each of them according to the text.

() 1. Hemoglobin being responsible for the red color of blood, is a protein present in the red blood cells.

() 2. Hemoglobin readily combine with oxygen in the lungs to form heme.

() 3. The function of hemoglobin is to transport oxygen to the tissues and to remove carbon dioxide.