有氧呼吸新鮮驅體

Speaker:易天華

老化

- 美國科學家最近針對老人的健康與生命期之研究發現，肺活量是隨著年齡的增長而下降的，老年人由於肺組織和肌肉、胸腔逐漸缺代彈性，以及功能衰退等原因，一次呼吸量較青壯年人明顯減少。
- 若長期堅持體育鍛煉的人，他們肺活量的減退非常緩慢，即使是60歲以上的老人，若能長期堅持適當的體力勞動和體育鍛煉，其肺活量仍能符合正常的數值；而不進行體育鍛煉的70歲老人，其肺活量就經常鍛煉的同齡人平均要低20.64%。

環境因素及飲食習慣的影響

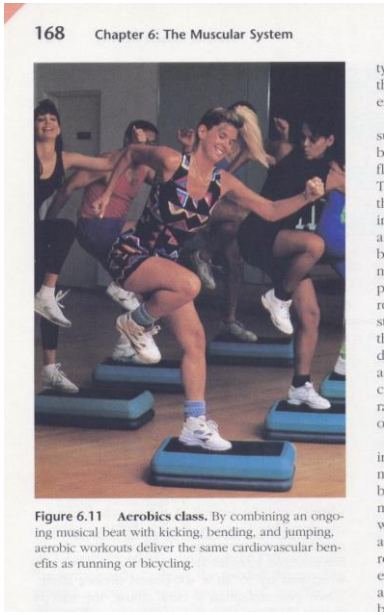
- 由於環境化學物的污染及溫度的變化，或飲食的攝取不當造成營養失調及肥胖，而導致體內環境產生變化時，缺氧原子便會造成代謝異常的現象：
- 1、細胞在無氧代謝下，會產生大量酸性廢物
- 2、心血管系統的生理與代謝功能性之異常
- 3、腦部缺氧時可造成病變區域的神經細胞成為靜止狀態，使細胞對外傳遞信息的工作暫停

有氧運動對健康的功效

- 人體細胞缺氧時無法正常新陳代謝，加大肺活量可提高血液內之含氧量，促進腦細胞新陳代謝的修復能力。
- 運動可以增加體內血液的氧氣量，促進人體新陳代謝的功能，而具備療效的運動方法，是經過教學經驗的累積與實際的研究與驗證。

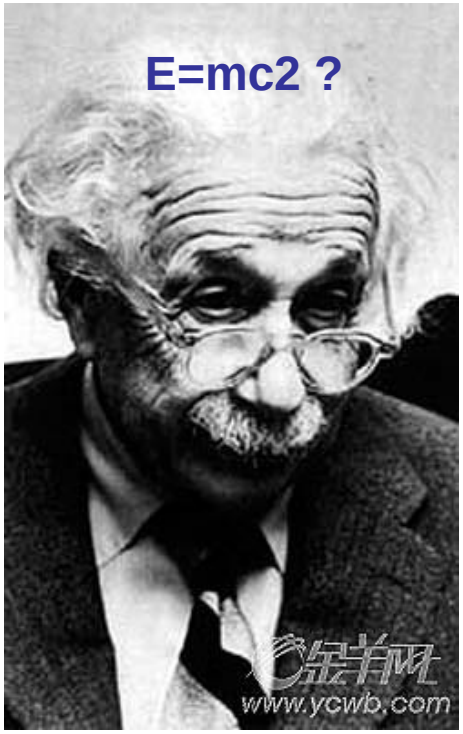
運動的好處

- 跳舞可延緩老化
- 太極拳可預防帕金森症
- 呼吸吐吶可預防高血壓
- 骨骼肌運動可降低血糖質
- 金鋼鐵布衫可提昇免疫力
- 韻律操可減重瘦身



運動醫學 = 再生醫學

運動=釋能



能量=質量x速度2

最新美國醫學文獻

"氣功"抑制大腸癌

氣? 氣? 氣?

O_2! O_2! O_2!

NO! NO! NO!

Cl^-! Cl^-! Cl^-!---

O_2芳蹤何處尋?

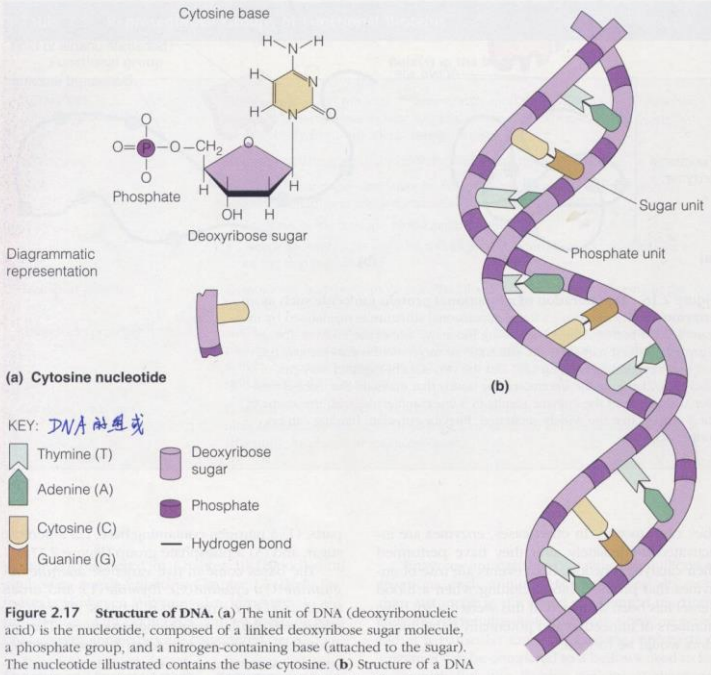


Figure 2.17 Structure of DNA. (**a**) The unit of DNA (deoxyribonucleic acid) is the nucleotide, composed of a linked deoxyribose sugar molecule, a phosphate group, and a nitrogen-containing base (attached to the sugar). The nucleotide illustrated contains the base cytosine. (**b**) Structure of a DNA molecule, two nucleotide chains coiled into a double helix. The "backbones" of DNA are formed by alternating sugar and phosphate molecules. The "rungs" are formed by the binding together of complementary bases (A to T, G to C) by hydrogen bonds.

Although both RNA and DNA are formed by the joining together of nucleotides, their final structures are different. As shown in Figure 2.17b, DNA is a long double chain of nucleotides. Its bases are A, G, T, and C, and its sugar is *deoxyribose*. Its two nucleotide chains are held together by hydrogen bonds between the bases, so that a ladderlike molecule is formed. Alternating sugar and phosphate molecules form the "uprights," or backbones, of the ladder, and each "rung" is formed of two joined bases (one base pair). Binding of the bases is very specific: A always binds to T, and G always binds

二十世紀的醫療技術 – 基因重組

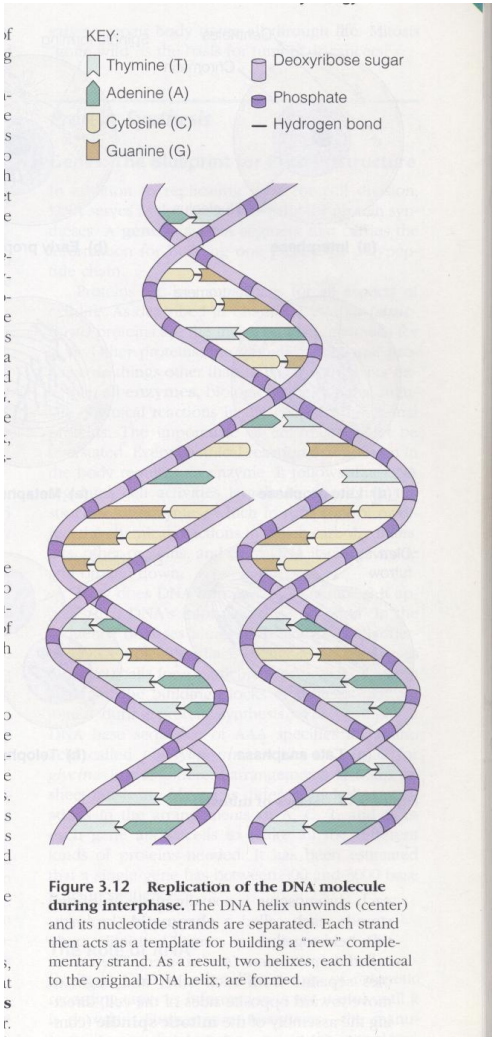
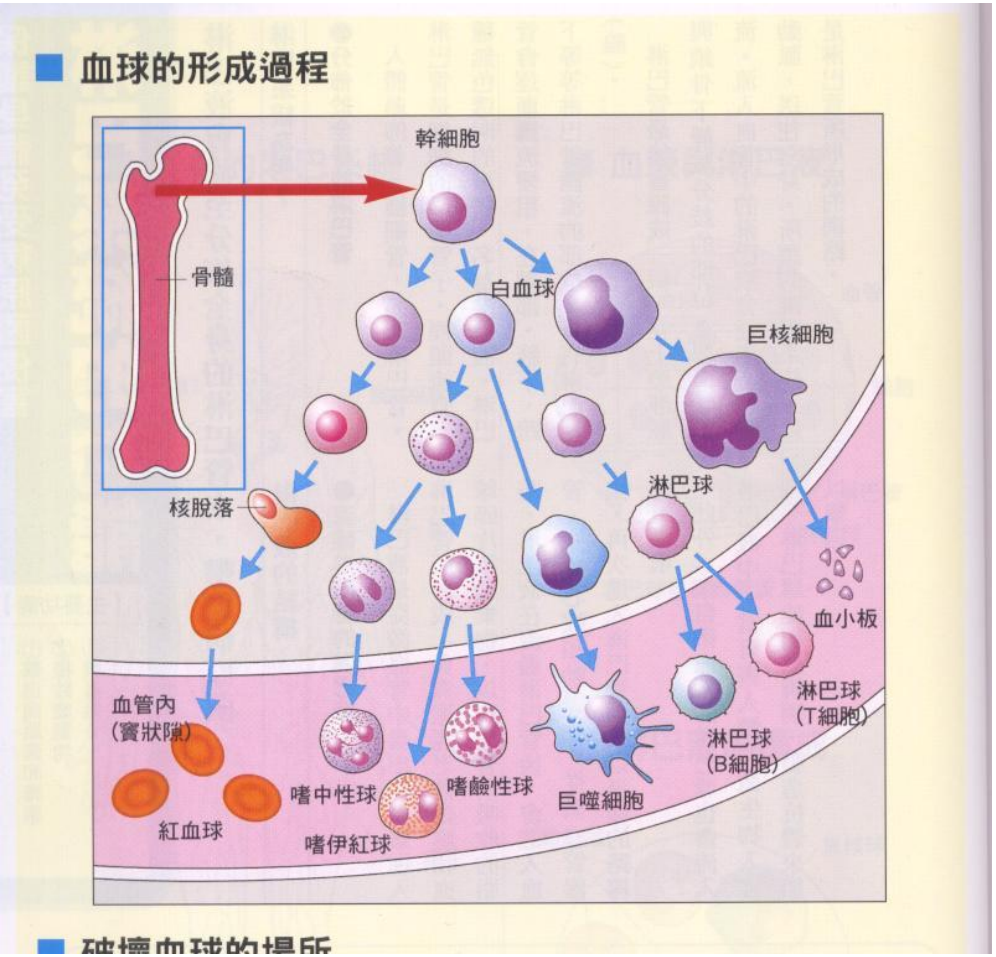


Figure 3.12 Replication of the DNA molecule during interphase. The DNA helix unwinds (center) and its nucleotide strands are separated. Each strand then acts as a template for building a "new" complementary strand. As a result, two helixes, each identical to the original DNA helix, are formed.

血桿細胞的家
骨髓


血球的形成過程
幹細胞
骨髓
白血球
巨核細胞
淋巴球
核脫落
血小板
血管內
(竇狀隙)
淋巴球
(T細胞)
淋巴球
(B細胞)
嗜中性球
嗜鹼性球
巨噬細胞
紅血球
嗜伊紅球

O_2窗口

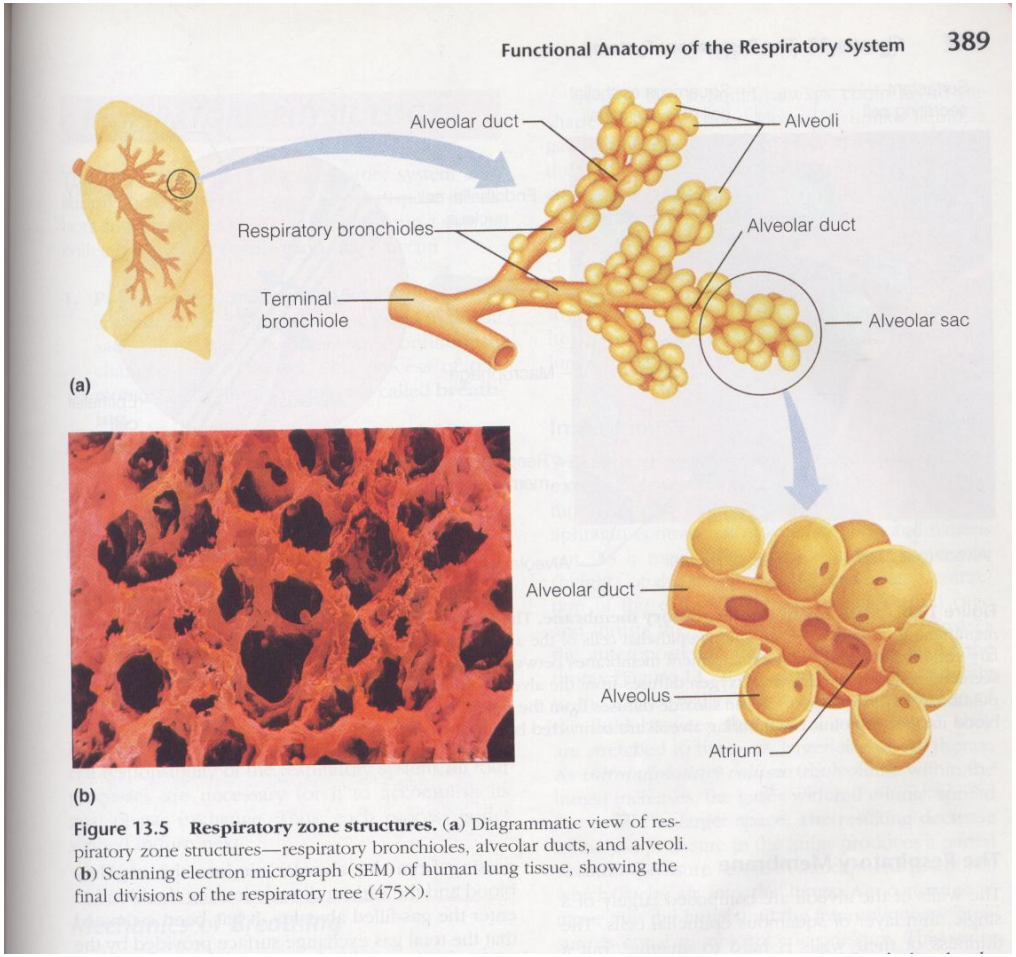
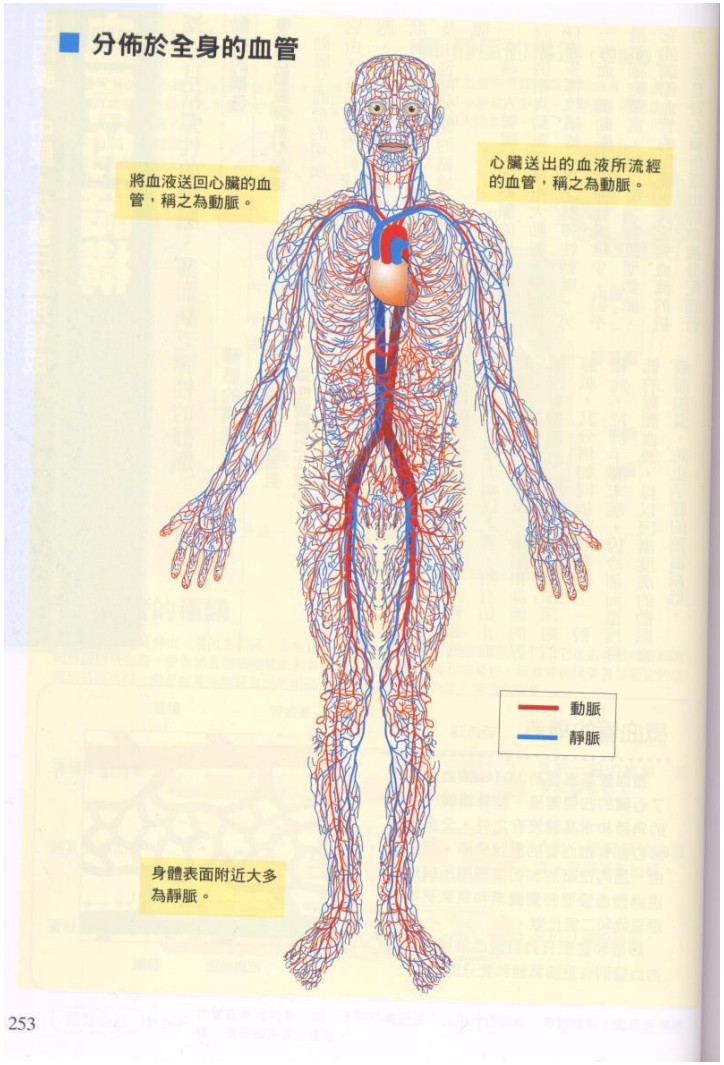


Figure 13.5 Respiratory zone structures. (**a**) Diagrammatic view of respiratory zone structures—respiratory bronchioles, alveolar ducts, and alveoli. (**b**) Scanning electron micrograph (SEM) of human lung tissue, showing the final divisions of the respiratory tree (475×).

一葉小舟?
1cc有160000個O_2

天羅地網?


分佈於全身的血管
將血液送回心臟的血管，稱之為動脈。
心臟送出的血液所流經的血管，稱之為動脈。
動脈
靜脈
身體表面附近大多為靜脈。
253

營養提供細胞的組成

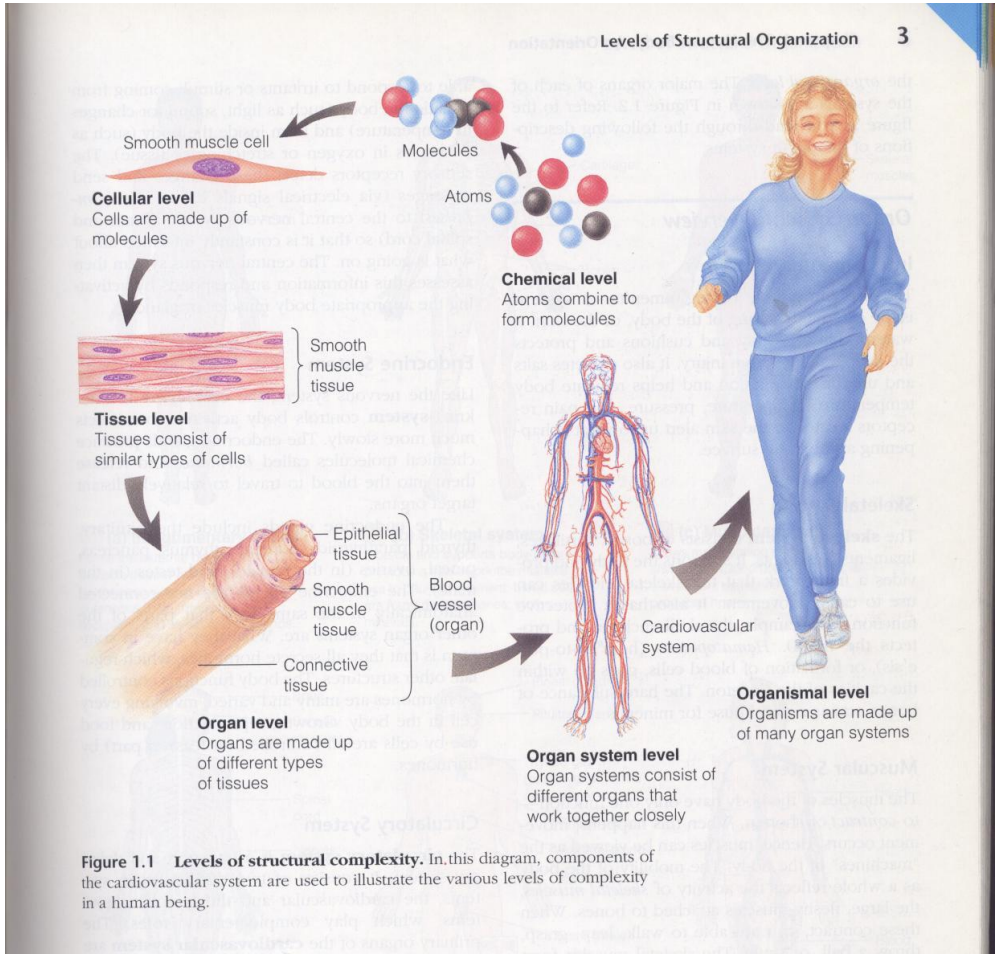


Figure 1.1 Levels of structural complexity. In this diagram, components of the cardiovascular system are used to illustrate the various levels of complexity in a human being.

維持恆定系統的基礎代謝率

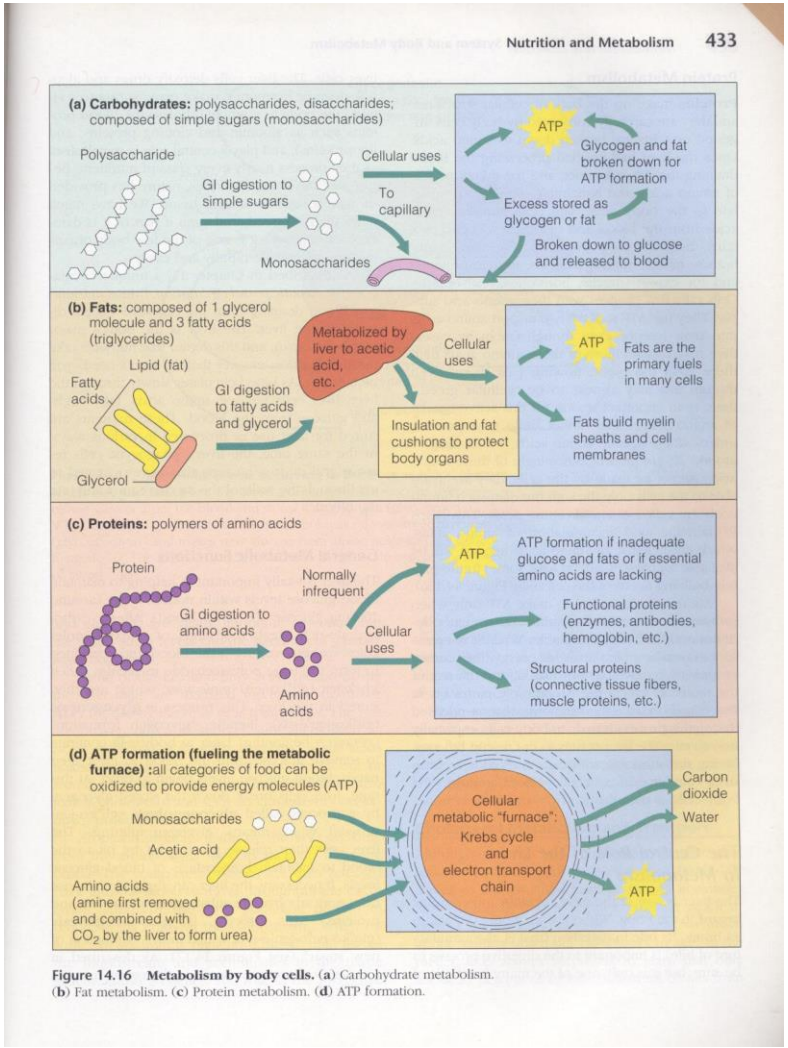


Figure 14.16 Metabolism by body cells. (a) Carbohydrate metabolism. (b) Fat metabolism. (c) Protein metabolism. (d) ATP formation.

細胞內粒腺體產能機制

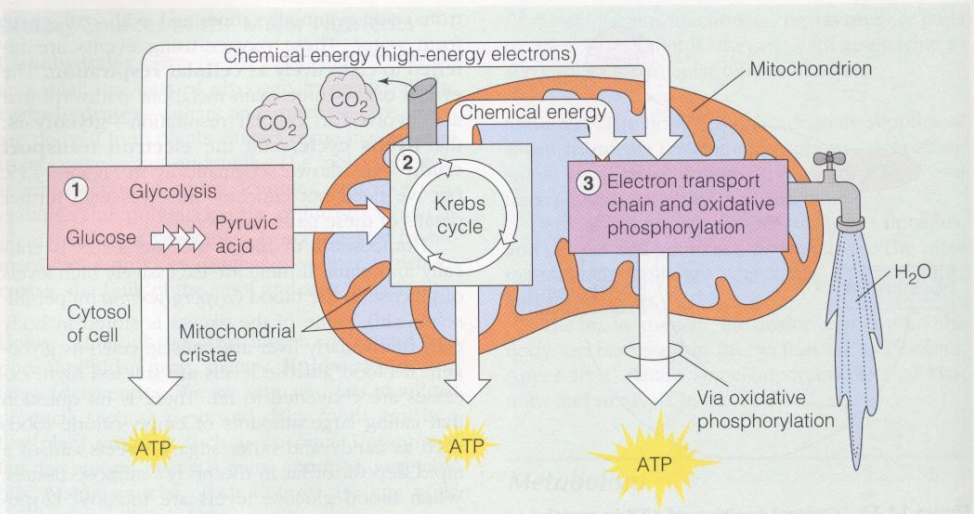


Figure 14.15 An overview of sites of ATP formation during cellular respiration. Glycolysis occurs outside the mitochondria in the cytosol. The Krebs cycle and the electron transport chain reactions occur within the mitochondria. (1) During glycolysis, hydrogen atoms containing high-energy electrons are removed as each glucose molecule is broken down to two molecules of pyruvic acid. (2) The pyruvic acid enters the mitochondrial matrix, where Krebs cycle enzymes remove more hydrogen and decompose the pyruvic acid to carbon dioxide. During glycolysis and the Krebs cycle, small amounts of ATP are formed. (3) Chemical energy from glycolysis and the Krebs cycle, in the form of hydrogen atoms containing energy-rich electrons, is then transferred to the electron transport chain, which is built into the membrane of the cristae. The electron transport chain carries out oxidative phosphorylation, which accounts for most of the ATP generated by cellular respiration and finally unites the removed hydrogen with oxygen to form water.

體內化學能–
ATP

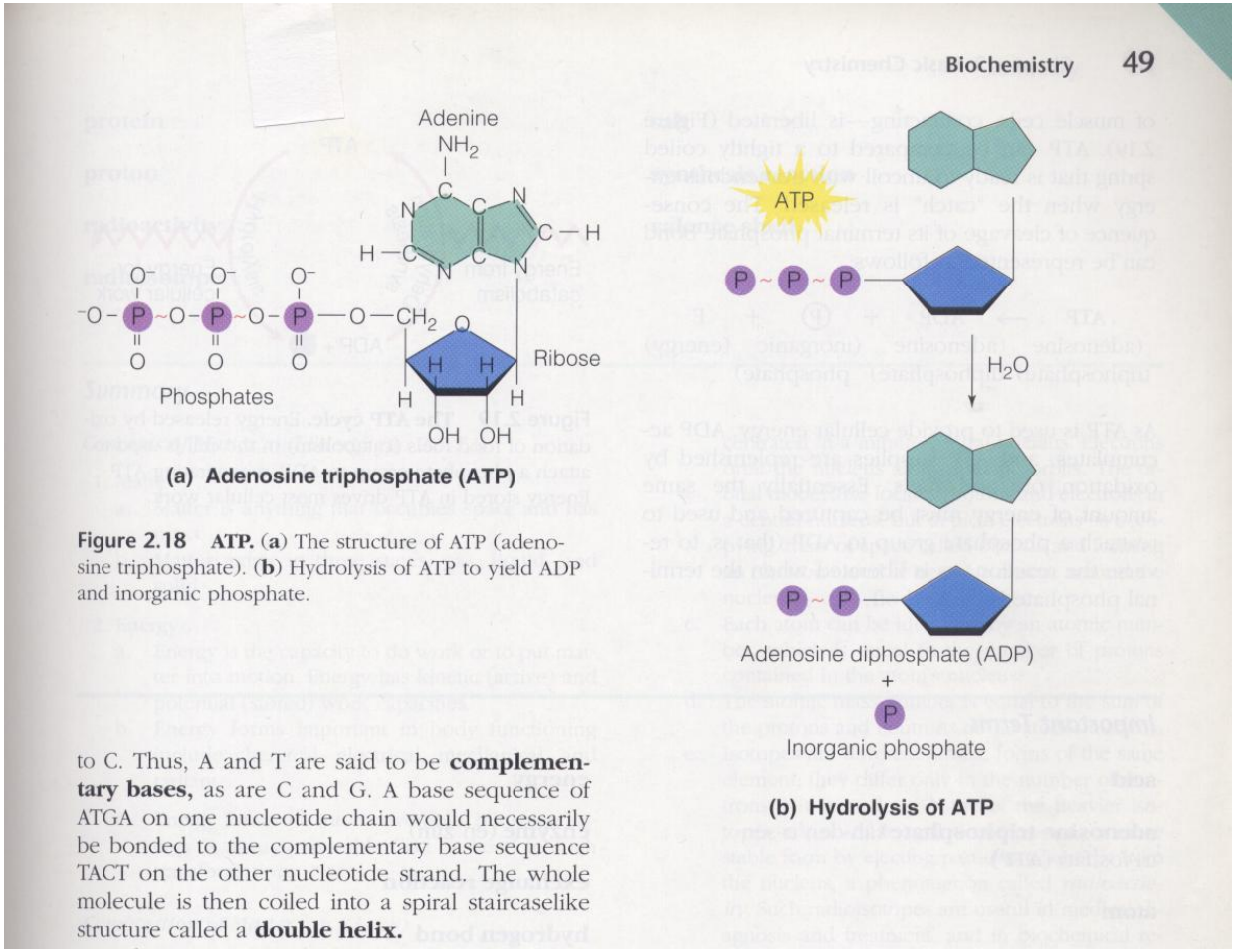


Figure 2.18 **ATP.** (**a**) The structure of ATP (adenosine triphosphate). (**b**) Hydrolysis of ATP to yield ADP and inorganic phosphate.

to C. Thus, A and T are said to be **complementary bases,** as are C and G. A base sequence of ATGA on one nucleotide chain would necessarily be bonded to the complementary base sequence TACT on the other nucleotide strand. The whole molecule is then coiled into a spiral staircaselike structure called a **double helix.**

有氧呼吸與無氧呼吸產能的百分比

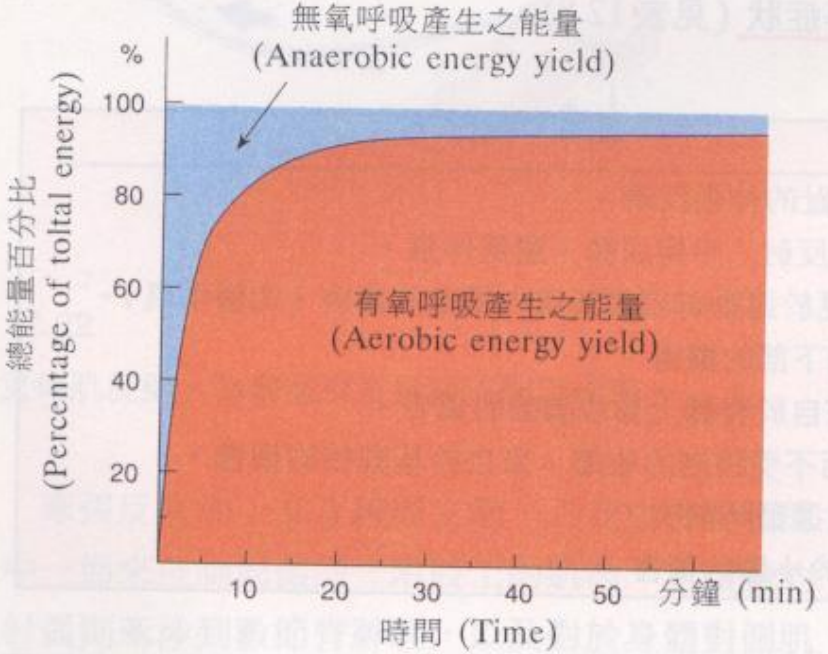


圖 12.23

長期受運動訓練者在最劇烈的運動狀況之下，體內以無氧呼吸及有氧呼吸供應的能量佔總能量之百分比。

運動中令人驚訝的定質

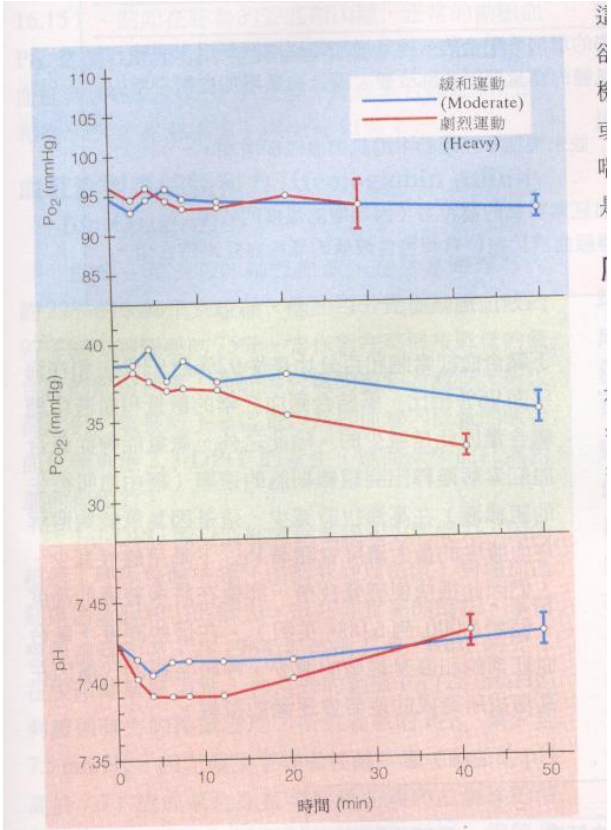
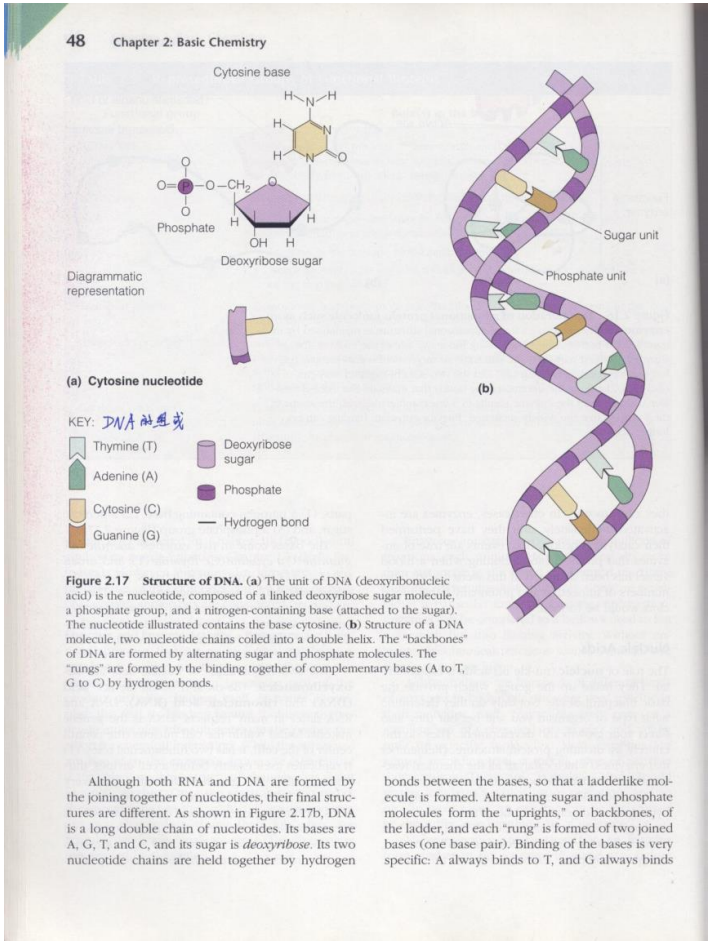


圖 16.40

溫和的和激烈的運動對動脈的氣體和 pH 的影響。注意在溫和的和激烈的運動最初的幾分鐘期間，這些測量值並無一致和明顯的改變，而在持續更久的運動中，僅有 P_{CO_2} 改變（事實上減少）繼續持續。

身內自有長生果,何須身外求靈丹



大家一起來運動

降血壓大雁功法

Thank you for your attention!