

世界最新 英汉双解植物学词典

The Facts On File
Dictionary of Botany

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Jill Bailey

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序

本词典是涵盖自然科学重要分支学科相关术语与概念的系列词典之一。该系列世界最新英汉双解词典包括《化学词典》、《生物学词典》、《植物学词典》、《生物化学词典》、《有机化学词典》、《无机化学词典》、《细胞与分子生物学词典》及《生物技术与遗传工程词典》。

《世界最新英汉双解植物学词典》涵盖了整个现代植物学理论与应用的各个方面,包括植物解剖学、植物形态学、植物生理学、植物生化学、植物细胞生物学、植物遗传学、植物进化学及植物生态学等各个分支学科。此外还涵盖了植物分类学的一些相关条目。本词典所涉及的概念力求清晰、明确,尽可能地提供相关的图表以及范例。词典还收录了对该领域做出重大贡献的人物小传记。正文后还附录了一系列相关的网页及参考书目。

本词典对于任何有兴趣学习或研究植物学的人都是一本有益的参考资料,尤其是对有兴趣学习有机体与种群、动植物结构与功能、分子与细胞的人更是不可多得的参考书目。然而我们的目的并不限于此,现代植物学是一门相当重要的学科,我们希望本词典能够给任何对该学科感兴趣的人提供有益的帮助。

译者序

20 世纪特别是 50 年代以来,由于植物生理学、生物化学和遗传学等的成就,如光合作用机制的阐明,光敏素、植物激素、微量元素发现,遗传育种技术、同位素计年法的建立,以及抗生物物质的分离等,植物学获得了飞速的发展。为了便于对该学科感兴趣的人们理解和学习当代植物学的知识,我们组织翻译了这本词典。

本词典由《The Facts On File Dictionary of Botany》翻译而来,涵盖了植物学相关的基本概念与应用的各个方面。收录词条 3000 多条,图表 80 多幅,词条释义准确、新颖,图表简洁、明了。词条按英文字母顺序排列,查阅方便;采用英汉对照形式编排,一目了然。词条中还收录了一些相关的人物传记,为词典增添了趣味性;附录中列举了国际单位制中的基本单位、导出单位及用于表示十进制的词缀,此外还提供了该领域有参考价值的网页与参考书目信息。

词典的翻译是一项要求高、难度大的工作,尽管我们在翻译过程中要求尽可能地贴近原文,历经多次审校,保证全书可读性、实用性与统一性的结合,但由于译者水平所限,本书中译文欠妥或失误之处,恭请各位同行和广大读者批评指正。

值此《世界最新英汉双解植物学词典》出版之际,首先要向参与本书翻译、校勘、审订工作的所有同仁表示诚挚的感谢;也要感谢促成本词典翻译、出版的世界图书出版西安公司及责任编辑;更要感谢为我们提供这本词典的原著作者 Jill Bailey 女士。

肖娅萍

2008 年春于陕西师范大学

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凡 例

1. 本词典收录词条 3000 多条,内容涵盖了当代植物学领域的基本术语和概念,以及在在这些领域做出过重要贡献的人物简介词条。

2. 本词典的编排方式为英汉双解,采用双栏排版,左栏为英文原文,右栏为相应的中文译文。由于两种语言不同,英汉两部分的内容并非完全对应,在尊重原文的基础上,尽量贴近词条本意。

3. 英文词条和相应的中文词条字体均采用黑体,解释部分的字体均采用白体。若英文词条有缩略语,则将该缩略语置于英文词条后面的括号中,中文词条后的括号也加入相应的缩略语。例如:

abscisic acid(ABA)... 脱落酸(ABA)……

英文术语的其他名称置于英文词条后面的括号中,相应的中文名称也置于中文词条后面的括号中。例如:

capillarity(capillary action)... 毛细现象(毛细管作用)……

4. 内容的排列顺序以英文词条首词的英文拼法顺序排列,词条后面括号中的缩略语及其他名称不参与排序。

5. 词条的解释:

① 从不同学科角度释义的,则分类列出。例如:

base 1. (*Chemistry*)... 1. 碱(化学)……
2. (*Biochemistry*)... 2. 碱基(生物化学)……

② 整体释义分层次解释或有多种词义的,则列小标题讲解,以突出不同梯度的知识点。例如:

absorption 1. ... 吸收 1. ...
2. ... 2. ...

③ 词条中出现的人名一般不予翻译,但已约定俗成的则列出对应中文名字。

④ 英文中的斜体、大小写均严格按相关规定书写。

⑤ 有些词条需要与其他词条参照或比较,则中英文均列出要参阅或比较的英文词条。例如:

alternate ... See *phyllotaxis*. 互生的 ...参阅 *phyllotaxis*.
abaxial ... Compare *adaxial*. 远轴的 ...比较 *adaxial*.

⑥ 由于原文疏漏、差错等原因,造成词条解释不详或有误的,均在正确译文后的括号内以“译者注”的形式另行标出。例如:

periclinal ... and an increase 平周的 ...及器官厚度(原文 *girth* in *girth* of the organ ... 有误,译者注)增加……

⑦ 正文后附录有相关的国际单位制、参考网页及参考书目。

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A

ABA See abscisic acid.

abaxial In structures such as a leaves and petals, the side facing away from the main axis, i. e. the lower surface. In lateral organs such as leaves, abaxial is synonymous with the underside. *Compare* adaxial.

abiotic environment The nonliving factors of the environment that influence ecological systems. Abiotic factors include climate, chemical pollution, geographical features, etc.

abscisic acid (ABA) A plant hormone, that functions chiefly as an inhibitor of growth and cell elongation. Abscisic acid has a variety of effects related to seed dormancy and stress responses; it regulates protein expression in seed development leading to dormancy and is one of the hormones involved in bud dormancy; it regulates stress responses by, for example, closing stomata in times of water shortage and increasing the ability of roots to carry water. It can also promote root growth and inhibit shoot growth. Despite its name it does not directly promote abscission, but only indirectly through increasing ethylene production. Formerly it was known

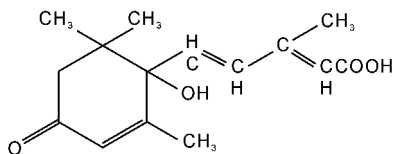
脱落酸 参阅 abscisic acid.

远轴的 用于描述在诸如叶子和花瓣的结构中背向主轴的一面,即下表面。在诸如叶子的侧生器官中,远轴是背面的同义词。比较 adaxial。

非生物环境 指影响生态系统的非生物因素。非生物因素包括气候、化学污染、地理特征等。

脱落酸 (ABA) 一种植物激素,其主要功能是抑制生长和细胞延长。脱落酸具有一系列涉及种子休眠和抗逆反应的作用。它调控着导致休眠的种子发育过程中的蛋白质表达,也是涉及芽休眠过程中的生长激素之一;它还调控着植物的抗逆反应,例如:在缺水时关闭气孔并增加根部输送水分的能力。此外它还可促进根的生长同时抑制芽的生长。尽管被称为脱落酸,但它并不直接促进脱落,而是间接通过增加乙烯的产生促进脱落。脱落酸以前被称为脱落素 II 或休眠素。

as *abscisin* II or *dormin*.



Abscisic acid
脱落酸

abscission The organized loss of part of a plant, usually a leaf, fruit, or unfertilized flower. An *abscission zone* occurs at the base of the organ. Here a separation layer (*abscission layer*) is formed by breakdown or separation of cells and final severance occurs when the vascular bundles are broken mechanically, e. g. by wind or rain. The abscission layer is activated by increasing levels of ethylene and a decreasing concentration of auxin.

absolute humidity See humidity.

absolute pollen frequency (APF) See pollen analysis.

absorption 1. The uptake of liquid by cells and organs. In plants, water and mineral salts are absorbed mainly by the root hairs, just behind the root tips.

2. The capture of radiant energy by plant pigments. About 80% of the visible light falling on a leaf is absorbed, and about 10% of the infrared radiation.

absorption spectrum A plot of the absorbance by a substance of radiation at different wavelengths, usually of ultraviolet, visible,

脱落 指植物部分器官的脱离,通常为叶、果或未受精的花。脱落区常发生在器官基部。当遭受风或雨等机械性破坏时,器官的维管束就会在高层处发生折断脱离。当乙烯的水平增加或生长素浓度减少时,高层便可以被激活。

绝对湿度 参阅 humidity。

绝对花粉频率 参阅 pollen analysis。

吸收 1. 指通过细胞或器官吸收液体。植物体中,水和矿物质主要通过根尖后方的根毛被吸收。

2. 指通过植物色素捕获辐射能量。约 80% 照射在叶子上的可见光被吸收,而其中约 10% 为红外线。

吸收光谱 指用于记录物质对不同波长光吸收情况的图谱,通常为紫外线、可见光或红外线。它可以

of infrared radiation. It can give information about the identity or quantity of a substance. Chlorophylls, for example, have absorption peaks in the red and blue (and therefore reflect green light). *Compare* action spectrum.

accessory cell *See* subsidiary cell.

accessory chromosome *See* B chromosome.

accessory pigment *See* photosynthetic pigments.

acellular Denoting relatively large tissues or organisms that are not composed of discrete cells and are, in effect, unicellular. In flowering plants, for instance, the early stages of endosperm development are often acellular. Other examples include aseptate fungal hyphae and certain green algae, such as *Acetabularia*. The term is used in preference to unicellular to distinguish such structures (which are often multinucleate) from conventional cells and show their equivalence to multicellular structures. *See also* coenocyte.

Aceraceae A family of temperate and tropical trees and shrubs that includes the maples and sycamores.

acetaldehyde (ethanal) An aldehyde, CH_3CHO , that is an intermediate in the conversion of pyruvic acid to ethanol during the final stage of glycolysis during

在某一物质的定性和定量方面提供信息。例如：叶绿素在红色和蓝色光区有吸收峰（因此它反射绿光）。比较 action spectrum.

副卫细胞 参阅 subsidiary cell.

副染色体 参阅 B chromosome.

辅(助)色素 参阅 photosynthetic pigments.

非细胞(组成)的 用于描述由单细胞而不是由分离细胞构成的相对较大的组织或有机体。例如：在开花植物中，早期胚乳的发育通常是非细胞组成的。其他例子还包括不具有隔膜真菌的菌丝以及一些绿藻，如伞藻。常用这个词而不用单细胞，是为了将这种结构（通常是多核的）与传统的细胞区别，显示其与多细胞结构的等价性。参阅 coenocyte.

槭树科 一类生长在温带或热带的树木或灌木，包括枫树和小无花果树。

乙醛 一种醛，化学式为 CH_3CHO ，在植物无氧呼吸过程中糖酵解的最后一个环节内，作为丙酮酸转化为乙醇的中间体。苏氨酸合成和分解

anaerobic respiration in plants. It is involved in the synthesis and breakdown of the amino acid threonine.

acetic acid (ethanoic acid) A carboxylic acid, CH_3COOH , obtained by the oxidation of ethyl alcohol. Acetic acid is a component of vinegar (which is obtained by bacterial oxidation of wine waste). It is used as an alternative carbon source by certain green algae. When combined with COENZYME A to form ACETYL COA, it plays a key role in AEROBIC RESPIRATION.

acetocarmine A stain used to color chromosomes deep reddish-black for viewing with a light microscope. Tissues are fixed in acetic acid before applying acetocarmine. See fixation; staining.

acetyl CoA (acetyl coenzyme A) A compound made up of acetyl and coenzyme A linked by a sulfur bridge. Acetyl CoA plays a key role in metabolism, being a precursor of the KREBS CYCLE and GLYOXYLATE CYCLE, and the starting point for synthesis of fatty acids, terpenes, and some amino acids. The synthesis of acetyl CoA is a high-energy process, requiring energy from ATP, which is converted to AMP.

achene A dry indehiscent fruit formed from an ovary with a single carpel containing a single seed, e. g. oak (*Quercus*). Different

的过程也涉及乙醛。

乙酸 一种羧酸, 化学式为 CH_3COOH , 通过乙醇氧化获得。乙酸是食用醋的成分之一(由酒渣在细菌中氧化获得)。在一些绿藻中被用作食用碳源的替代物。当与辅酶 A 结合形成乙酰辅酶 A 时, 在有氧呼吸中起重要作用。

乙酸洋红 一种染料, 可将染色体显色为深红色, 从而在光学显微镜下可见。在应用这种染料前, 组织需用乙酸固定。参阅 fixation; staining。

乙酰辅酶 A 指由乙酰基和辅酶 A 通过硫键连接的一种化合物。它在新陈代谢过程中起重要作用, 是三羧酸循环和乙醛酸循环的前体物质, 而且还是脂肪酸、萜类以及一些氨基酸合成的起始点。合成乙酰辅酶 A 是一个需要 ATP 供能的高能过程, 在这个过程中 ATP 转变为 AMP。

瘦果 指一种由一个心皮构成的子房形成的干闭果, 果内仅含有一粒种子, 如橡树果实。不同类型的瘦果还包括颖果、莲萼瘦果、坚果、翅

types of achenes include the CARYOPSIS, CYPSELA, NUT, and SAMARA.

acicular Needle-shaped.

acid A substance that gives rise to hydrogen ions (or H_3O^+) when dissolved in water. An acid in aqueous solution will have a pH below 7. *Lowry-Bronsted theory* defines an acid as a substance that exhibits a tendency to release a proton, and a base as a substance that tends to accept a proton. Strong acids (e. g. HNO_3) react completely with water to give H_3O^+ . Weak acids (e. g. CH_3COOH) are only partly dissociated because H_3O^+ is a stronger acid than the free acids.

acidic stain See staining.

acid rain The deposition of acids by natural precipitation, mainly by rain but also by snow and fog. Acids are formed by reaction of gaseous waste products, particularly sulfur dioxide, and also nitrogen oxides, with moisture in the air to form sulfuric and nitric acids. The subsequent precipitation has led to raised acidity in forests and lakes, especially in Scandinavia and some other parts of northern Europe, damaging the environment. Acid rain is often used more loosely for any atmospheric pollutant that dissolves in precipitation causing environmental damage, such as carbon monoxide or ozone, and these may interact with the acids.

果等。

针状的 形状像针的。

酸 指溶解在水中可产生氢离子或 H_3O^+ 的一类物质。在水溶液中酸的 pH 值 < 7 。Lowry-Bronsted 理论定义酸为有可能释放质子的物质, 碱为有可能接受质子的物质。强酸 (如 HNO_3) 与水完全反应释放 H_3O^+ 。弱酸 (如 CH_3COOH) 在水中部分解离, 因为 H_3O^+ 是一种比自由酸更强的酸。

酸性染料 参阅 staining.

酸雨 指通过自然降水使酸沉降的过程, 主要通过雨其次为雪和雾。酸主要由二氧化硫和氧化氮等废气成分与空气中的水蒸气形成的硫酸和含氮的酸组成。酸雨造成了森林与湖泊酸性增加、环境破坏, 尤其是在斯堪的纳维亚半岛和其他北欧国家。酸雨这个术语通常广泛用于描述任何可溶解于降水而引起环境破坏的大气污染物, 如一氧化碳、臭氧等, 而这些物质可与酸发生反应。

20 世纪最严重的污染物是二氧化硫, 它主要来自煤的燃烧。现在这一情况稍有缓和。土壤中的硫酸导致了硫酸铵土壤的形成, 进而导致可抑制生物新陈代谢活性有毒的铝和重金属离子的释放, 在水中这些物质还可以损害鱼类的鳃。未被污染的正常雨水稍偏酸性, pH 值约

The most serious pollutant is sulfur dioxide, which comes mainly from burning coal and is, consequently, less serious now than in the twentieth century. Sulfuric acid in soils may lead to the formation of ammonium sulfate, which causes the release of toxic aluminum and heavy metal ions that inhibit metabolic activity. In waterways these can damage the gills of fish. Unpolluted rain is normally slightly acidic with a pH of 5.0–5.6.

acid soil A soil with a pH less than 6.0. Such soils usually form in areas of heavy rainfall, which causes leaching of lime from the surface layers, or over acid substrata such as granite or sand. In the acidic conditions, decomposition of organic material in the soil is slow. Acid soils often contain substantial concentrations of iron and aluminum hydroxides. *See* brown earth; podsol.

Acrasiomycota (cellular slime molds) A class of protocists in the phylum Rhizopoda. Formerly considered to be fungi, they are made up of independently living amoebas that feed on bacteria, which they ingest by phagocytosis. Under conditions of food shortage or other stresses, they come together to form a slug-like aggregation of amoebas called a *pseudoplasmodium*, which acts like an individual organism.

acrocarpous Describing mosses in which the reproductive organs are borne at the

of 5.0–5.6.

酸性土壤 指 pH 值 < 6.0 的土壤。这种土壤通常在降水量较多的地区形成,大雨造成土壤表层石灰的沥滤或覆盖了酸性地层如花岗岩或沙土。在酸性环境下,有机物质在土壤中的沉积作用是缓慢的。酸性土壤富含铁和铝的氢氧化物。参阅 brown earth; podsol.

集胞黏菌门(细胞状黏菌) 根足亚纲的一类原生生物。以前被认为是真菌类,由能独立生活的变形虫组成,这些变形虫以细菌为食,通过吞噬作用将其消化。在食物短缺或其他条件下,可以形成变形虫的集合体,称为伪原质团,其行动类似一种独立的生物体。

顶(生)蒴的 用于描述苔藓植物的生殖器官产生在主轴顶端,通常

top of the main axis, which is usually erect, so that subsequent growth is sympodial.

acrocentric See centromere.

acropetal Describing a process (such as growth or development) that progresses from the base or point of attachment, so that the oldest parts are at the base and the youngest are at the tip. Compare basipetal.

actin A globular contractile protein (G-actin) that makes up 10–15% of the total cell protein in eukaryotic cells. It is a major component of the CYTOSKELETON. It also controls motility, cellular movements, and cyclosis. G-actin can polymerize into helical strands that coil together to form microfilaments called *fibrous actin* (F-actin).

Actinobacteria (ray fungi; actinomycetes)

A phylum of Eubacteria that contains the true actinobacteria and the *coryneform bacteria*. The true actinobacteria form branching filaments that resemble small fungal mycelia, with hyphae usually less than 1.5 μm in diameter; the coryneform bacteria are rodlike structures. The Actinobacteria are distinguished by producing *actinospores*; entire cells encysted in thick walls to form resistant spores.

是直立的,因此其后继的生长是合轴生长。

具近端着丝点的(染色体) 参阅 centromere。

向顶的 用于描述从基部或附着点进行的一种生长或发育,因此较早生长的部分在基部,而新生的部分在顶端。比较 basipetal。

肌动蛋白 一种球状收缩蛋白(G肌动蛋白),约占真核细胞总蛋白含量的10%~15%,是细胞骨架的主要组分。它还控制着细胞运动与胞质环流。G肌动蛋白可聚合为螺旋状结构继而盘绕形成微丝,通常被称为含纤维的肌动蛋白(F肌动蛋白)。

放线菌 真细菌的一门,包含真放线菌与棒状杆菌。真放线菌形成分支状菌丝,类似于小真菌的菌丝体,菌丝直径通常 $<1.5\mu\text{m}$;棒状杆菌为杆状结构。放线菌的特征是能够产生放线菌孢子,它是一种包被于厚壁中的完整细胞,具有一定的抵抗能力。

actinodromous (palmate; digitate) Describing a form of leaf VENATION in which three or more primary veins radiate from the base of the lamina toward the margin, as in sycamore (*Acer pseudoplatanus*), resulting in a leaf that has several large lobes or several leaflets all originating at the same point.

actinomorphy See radial symmetry.

actinomycetes See Actinobacteria.

actinostele A type of protostele in which the xylem is star shaped and the phloem lies between the points of the star. Protosteles are found in the primary roots of higher plants, and in some species of *Lycopodium* and *Psilotum*. See stele.

action spectrum A graph showing the effect of different wavelengths of radiation, usually light, on a given process. It is often similar to the absorption spectrum of the substance that absorbs the radiation and can therefore be helpful in identifying that substance. For example, the action spectrum of photosynthesis similar to the absorption spectrum of chlorophyll. It shows the net assimilation plotted against wavelength. See absorption spectrum.

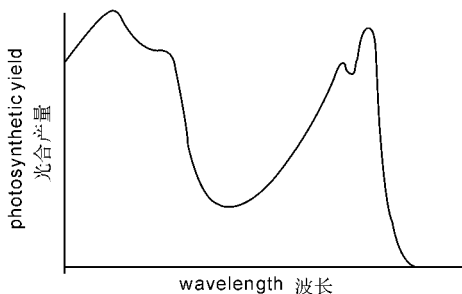
具掌状脉的 用于描述叶子脉序的一种类型,是由叶基辐射状分出3条或多条主脉伸向叶缘,如大槭树的叶子。结果往往是,在一片叶子中具有起源于同一点的多个裂片或小叶。

辐射对称性的 参阅 radial symmetry。

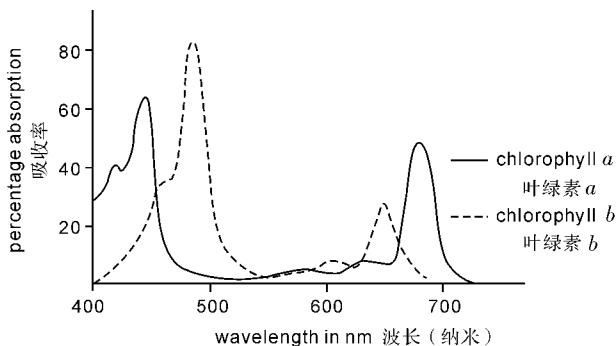
放线菌类 参阅 Actinobacteria。

星状中柱 原生中柱的一种类型。木质部为星形,韧皮部位于星形突起之间。原生中柱存在于高等植物的初生根中,在石松属和裸蕨属的一些种类中也可以见到。参阅 stele。

作用光谱 在特定过程中表示不同波长的辐射,通常指光影响的图谱。它与吸收辐射的物质的吸收光谱类似,因此有助于鉴定该物质。例如:光合作用的作用光谱一般与叶绿素的吸收光谱相吻合。它显示了净吸收相对于波长的坐标图。参阅 absorption spectrum。



Action spectrum of photosynthesis
光合作用光谱



Absorption spectrum of chlorophylls
叶绿素吸收光谱

activation energy The minimum extra energy that must be put into a system to enable a reaction to occur. It increases the energy levels of participating molecules, and hence raises their reactivity, often by raising electrons to an excited state. ENZYMES enhance reaction rates by lowering the activation energy. This is often achieved by the attraction of the reactants to the enzyme's active site, thus coming into closer proximity, or by the enzyme

活化能 指一个反应发生所需要输入系统的最小能量。它增加了反应物分子的能量水平, 通过把电子提高到激发态而提高反应物分子的活性。酶可以使反应的活化能降低从而加快反应速率。这一般可以通过吸引反应物到达酶的活化位点, 继而使两者相互靠近, 或者通过酶使一个或多个反应物的构象或静电荷发生变化来实现。

causing conformational or electrostatic changes in one or more of the reactants.

activator 1. A metal ion that acts together with an enzyme or its substrate to bring about a reaction.

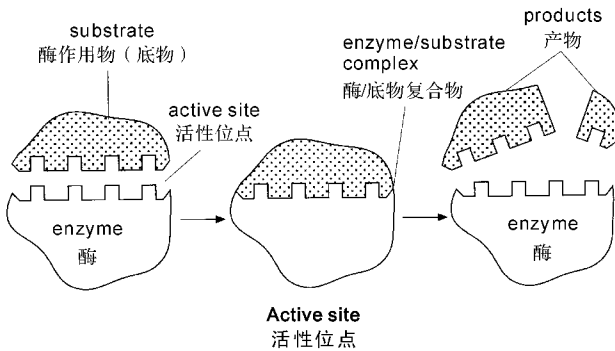
2. A protein that positively regulates the transcription of a gene.

active site The particular part of an enzyme molecule that combines with and acts on the substrate. The active site consists of amino acids arranged in a configuration specific to a particular substrate or type of substrate. Binding of an inhibiting compound elsewhere on the enzyme molecule may change this configuration and hence the efficiency of the enzyme activity. See allosteric site.

活化剂 1. 指一种可以和酶反应的金属离子或可以产生化学反应的金属离子底物。

2. 一种对基因转录进行正向调控的蛋白。

活性位点 指酶分子中直接与底物结合并发生反应的特定部位。活性部位由排列成一定空间结构的氨基酸构成,这种结构对特定底物或一类底物具有特异性。如果在酶分子其他部位结合了抑制性化合物则其构象就要发生改变,从而影响酶的活性。参阅 allosteric site。



active transport The transport of molecules or ions across a cell membrane against a concentration gradient, with the expenditure of energy, usually in the form of ATP. It is probably an attribute of all cells. Anything that interferes with the

主动转运 指伴随着 ATP 的形成、能量的消耗,逆浓度梯度的分子或离子的跨膜转运。几乎所有细胞都存在这种转运方式。任何能够影响到能量供应的因素都可影响到主动转运。主动转运的典型机制是横