

Biology definitions are marked on the naming of structures and processes, and on the condition attached to them. Where a definition contains a comparison or a location, that clause is usually the second mark. 生物定义题的分数在于结构名称与限定条件。

Cell structure and transport

Resolution 分辨率 — the ability to distinguish two points as separate; it is limited by the wavelength used, which is why electron microscopes resolve more than light microscopes

Magnification 放大倍数 — the number of times larger an image is than the actual object

Organelle 细胞器 — a functionally and structurally distinct part of a cell

Prokaryote 原核生物 — a cell with no nucleus and no membrane-bound organelles, with DNA free in the cytoplasm

Diffusion 扩散 — the net movement of molecules from a region of higher to lower concentration, down a gradient, as a result of random motion – a passive process

Osmosis 渗透 — the net movement of water molecules from a region of higher to lower water potential through a partially permeable membrane

Water potential 水势 — the tendency of water to move out of a solution; pure water has the highest value, zero, and adding solute makes it more negative

Active transport 主动运输 — the movement of molecules across a membrane against the concentration gradient using energy from ATP and a carrier protein

Facilitated diffusion 易化扩散 — passive movement down a gradient through a channel or carrier protein

Fluid mosaic model 流动镶嵌模型 — a membrane described as a phospholipid bilayer in which proteins are embedded and free to move laterally

Biological molecules and enzymes

Monomer / polymer 单体与聚合物 — a small repeating unit; a molecule made of many monomers joined by condensation

Condensation reaction 缩合反应 — the joining of two molecules with the removal of a water molecule

Enzyme 酶 — a biological catalyst, made of protein, that speeds up a reaction by lowering the activation energy without being used up

Active site 活性位点 — the region of an enzyme with a shape complementary to its substrate, where the reaction occurs

Induced fit 诱导契合 — the active site changes shape slightly as the substrate binds, so the fit becomes exact

Competitive inhibitor 竞争性抑制剂 — a molecule similar in shape to the substrate that binds the active site; its effect is reduced by raising substrate concentration

Non-competitive inhibitor 非竞争性抑制剂 — a molecule that binds elsewhere and alters the shape of the active site; raising substrate concentration does not overcome it

Denaturation 变性 — a permanent change in the tertiary structure of a protein, breaking bonds so the active site no longer fits the substrate

Vmax and Km 最大反应速度与米氏常数 — Vmax is the maximum rate when all active sites are occupied; Km is the substrate concentration at half Vmax, so a LOW Km means a high affinity

Genetics and inheritance

Gene 基因 — a length of DNA that codes for a polypeptide

Allele 等位基因 — one of two or more alternative forms of a gene at the same locus

Genotype / phenotype 基因型与表型 — the alleles an organism carries; the observable characteristics resulting from the genotype and the environment

Homozygous / heterozygous 纯合与杂合 — carrying two identical alleles of a gene; carrying two different alleles

Codominance 共显性 — where both alleles of a heterozygote are expressed in the phenotype

Mutation 突变 — a change in the base sequence of DNA, or in chromosome structure or number

Transcription 转录 — the synthesis of mRNA from a DNA template strand

Translation 翻译 — the synthesis of a polypeptide from an mRNA sequence at a ribosome, with tRNA bringing amino acids

Meiosis 减数分裂 — two divisions producing four genetically different haploid cells from one diploid cell

Crossing over 交换 — the exchange of sections of chromatid between homologous chromosomes during prophase I, producing new allele combinations

Independent assortment 自由组合 — the random orientation of homologous pairs at the equator in metaphase I, so maternal and paternal chromosomes are distributed independently

Physiology

Homeostasis 稳态 — the maintenance of a constant internal environment within narrow limits, despite changes outside

Negative feedback 负反馈 — a change from the set point triggers a response that reverses it and restores the set point

Resting potential 静息电位 — the potential difference across an axon membrane when it is not conducting an impulse, about -70 mV, maintained by the sodium-potassium pump

Action potential 动作电位 — a brief reversal of the membrane potential caused by an influx of sodium ions, once the threshold is reached – it is all-or-none

Synapse 突触 — the junction between two neurones, across which a neurotransmitter diffuses

Cardiac output 心输出量 — the volume of blood pumped by one ventricle per minute; stroke volume times heart rate

Tidal volume 潮气量 — the volume of air moved in or out of the lungs in one normal breath at rest

Transpiration 蒸腾作用 — the loss of water vapour from the aerial parts of a plant, mainly through the stomata

Cohesion–tension theory 内聚力-张力学说 — water is pulled up the xylem as a continuous column, held together by hydrogen bonding, by the tension created when water evaporates from the leaf

Translocation 韧皮部运输 — the transport of assimilates through the phloem from source to sink

Ecology and evolution

Ecosystem 生态系统 — a community of organisms interacting with each other and with their non-living environment

Niche 生态位 — the role of an organism in its ecosystem, including where it lives and how it obtains resources

Biodiversity 生物多样性 — the variety of ecosystems, species and genetic variation within a species in a given area

Species 物种 — a group of organisms with similar morphology and physiology that can breed to produce fertile offspring

Natural selection 自然选择 — variation exists; more offspring are produced than survive; those with advantageous alleles are more likely to survive and reproduce, so the frequency of those alleles rises

Selection pressure 选择压力 — an environmental factor that affects the chance of survival and reproduction, and so changes allele frequencies

Speciation 物种形成 — the formation of a new species when populations become reproductively isolated and diverge

Hardy–Weinberg principle 哈迪-温伯格原理 — allele frequencies stay constant between generations provided the population is large, mating is random, and there is no selection, mutation or migration