Gene Expression and Regulation

AP Biology · Vocabulary in context

Word	Example
double helix /ˈdʌbl ˈhiːlɪks/	DNA is shaped like a **double helix**: a twisted ladder. DNA
nucleotides /ˈnjuːklɪətaɪdz/	DNA is made of **nucleotides**. DNA
complementary base pairing /ˌkɒmplɪˈmentəri beɪs ˈpeərɪŋ/	**Complementary base pairing** joins A with T and G with C. A T G C
antiparallel /ˌæntɪˈpærəlel/	The two DNA strands are **antiparallel**: they run in opposite directions. DNA
purines	A and G are **purines**: they have two rings. A G
pyrimidines	C and T are **pyrimidines**: they have one ring. C T
ribosomal RNA /ˈrɪbəsɒml ˌɑː en ˈeɪ/	The ribosome contains **ribosomal RNA**.
single circular chromosome /ˈsɪŋgl ˈsɜːkjʊlə ˈkrəʊməsəʊm/	Bacteria have a **single circular chromosome**.
plasmids /ˈplæzmɪdz/	Bacteria have small rings of DNA called **plasmids**. DNA
multiple linear chromosomes /ˈmʌltɪpl ˈlɪnɪə ˈkrəʊməsəʊmz/	Human cells have **multiple linear chromosomes**.
histones /ˈhɪstəʊnz/	DNA wraps around **histones**. DNA
semiconservatively /ˌsemɪkənˈsɜːvətɪvli/	DNA copies **semiconservatively**: each new molecule keeps one old strand. DNA

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DNA polymerase /ˌdiː en ˈeɪ ˌpɒlɪməˈreɪz/	**DNA polymerase** builds the new DNA strand. DNA DNA
helicase /ˈhelɪkeɪs/	The enzyme **helicase** unwinds the helix and breaks the hydrogen bonds between the bases.
topoisomerase /ˈtɒpɔɪsəʊmreɪz/	**Topoisomerase** stops the DNA getting too twisted. DNA
primase	**Primase** makes a short RNA starter.
ligase /ˈlɪgeɪs/	**Ligase** joins pieces of DNA together. DNA
leading strand /ˈliːdɪŋ strænd/	The **leading strand** is copied in one long piece.
lagging strand /ˈlægɪŋ strænd/	The **lagging strand** is copied in short pieces that are joined later.
Okazaki fragments	**Okazaki fragments** form on the lagging strand.
Transcription /træn'skrɪpʃn/	**Transcription** makes an RNA copy of a gene. RNA
messenger RNA /ˈmesɪndʒə ˌɑː en ˈeɪ/	**Messenger RNA** carries the gene's message to the ribosome.
introns /ɪnˈtrɒnz/	**Introns** are pieces of a gene that are cut out of the mRNA. mRNA
exons /eɡˈzɒnz/	**Exons** are the parts of a gene that are kept.
poly-A tail	A **poly-A tail** protects mRNA. mRNA
alternative splicing	**Alternative splicing** makes different proteins from one gene.

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Translation /træn'sleɪʃn/	**Translation** uses the RNA message to join amino acids in the right order. RNA
ribosome /'ri:bəʊsəʊm/	The **ribosome** builds the protein.
codons /'kəʊdɒnz/	**Codons** are groups of three bases.
transfer RNA /'trænsfɜ: ˌɑ: en 'eɪ/	**Transfer RNA** brings amino acids to the ribosome.
retrovirus	HIV is a **retrovirus**: it turns its RNA into DNA. HIV RNA DNA。
reverse transcriptase /rɪ'vɜ:s træn'skrɪpteɪs/	**Reverse transcriptase** makes DNA from an RNA copy. RNA DNA
start codon	AUG is the **start codon**. AUG
anticodon /ˌæntɪ'kəʊdɒn/	The **anticodon** on a tRNA matches a codon on the mRNA. tRNA mRNA
peptide bond /'peptaɪd bɒnd/	A **peptide bond** joins two amino acids.
stop codon /stɒp 'kəʊdɒn/	A **stop codon** tells the ribosome to stop.
operons /'ɒpərənz/	Bacteria control genes with **operons**.
constitutive	**Constitutive** genes are always switched on.
inducible	An **inducible** operon is switched on when needed.
promoter /prə'məʊtə/	A **promoter** is where RNA polymerase starts reading a gene.
repressor /rɪ'presə/	A **repressor** protein blocks transcription.

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repressible	A **repressible** operon is usually on but can be switched off.
epigenetic	An **epigenetic** change affects a gene without changing its code.
histone acetylation	**Histone acetylation** loosens DNA so genes can be read. DNA
differential gene expression /ˌdɪfə'renʃl dʒi:n ek'spreʃn/	**Differential gene expression** makes cells different.
transcription factors /træn'skrɪpʃn 'fæktəz/	**Transcription factors** switch genes on or off.
enhancers	**Enhancers** increase transcription from far away.
microRNA	**MicroRNA** blocks mRNA from being translated. mRNA
mutation /mju:'teɪʃn/	A **mutation** is a change in the DNA. DNA
frameshift /'freɪmʃɪft/	A **frameshift** changes every codon after the mistake.
mutagens	UV light and some chemicals are **mutagens**. UV
missense	A **missense** change swaps one amino acid for another.
nonsense	A **nonsense** change creates an early stop signal.
nondisjunction /ˌnɒndɪs'dʒʌŋkʃn/	**Nondisjunction** happens when chromosomes fail to separate.
aneuploidy /'eɪnəplɔɪdi/	**Aneuploidy** means having too many or too few chromosomes.

Word	Example
horizontal gene transfer	**Horizontal gene transfer** passes resistance genes between bacteria.
transformation /trænsfɔ:'meɪʃn/	In bacterial **transformation**, a cell takes up DNA from its surroundings. DNA
transduction /træns'dʌkʃn/	In **transduction**, the signal is passed along inside the cell.
conjugation	In **conjugation**, bacteria pass DNA to each other. DNA
transposon	A **transposon** is a gene that can jump to a new place.
Biotechnology /ˌbaɪəʊtek'nɒlədʒi/	**Biotechnology** uses living things to make products.
PCR /ˌpi: si: 'ɑ:/	**PCR** can find a germ's DNA in one or two hours. DNA
gel electrophoresis /dʒel ɪˌlektrəʊfɔ:'ri:sɪs/	**Gel electrophoresis** separates pieces of DNA by size. DNA
cloning	**Cloning** makes exact copies of a gene or organism.
genetically modified organism /dʒɪ'netɪkli 'mɒdɪfaɪd 'ɔ:gənɪzəm/	Golden rice is a **genetically modified organism**.
RNA primer /ˌɑ: en 'eɪ 'praɪmə/	An **RNA primer** starts DNA replication. DNA
RNA polymerase /ˌɑ: en 'eɪ ˌpɒlɪmə'reɪz/	**RNA polymerase** makes RNA from DNA. DNA RNA
DNA methylation	**DNA methylation** can switch genes off.

Word	Example
DNA sequencing	**DNA sequencing** reads the order of bases.

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