

**fact sheet**

**Gene expression 4:**

**Gene glossary**

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| alternative splicing | Introns and exons are removed differentially from messenger RNA resulting in variant mRNA sequences that are used to make different molecular products. |
| amino acid chain | During translation amino acids form chains which are folded into proteins. |
| amino acid | an organic compound used to build protein |
| cell differentiation | development of a cell type with a specific form and function |
| cell membrane | a membrane that protects the cell from the external environment |
| chromosome | These structures, found in the cell nucleus of plants and animals, carry genetic information. |
| codon | a three nucleotide unit of genetic material in mRNA that codes for an amino acid |
| cytoplasm | portion of the cell containing organelle and other particles |
| DNA | deoxyribonucleic acid, the genetic instructions of living organisms |
| elongation factors | These are regulating protein molecules that help with addition of nucleotides during transcription, and elongation of an amino acid chain during translation. |
| enhancer | This nucleotide sequence on DNA helps initiate transcription of a gene, and interacts with transcription factors to start transcription. |
| eukaryotic | any living organism in which cells contain a nucleus and other organelles |
| exon | nucleotide sequence of a gene that contains information needed to build a protein |
| gene expression | This is the activity of a gene within a cell: decoding of DNA to make a molecular product, such as a protein. |
| gene regulation | control of gene expression — turning genes within cells ‘on’ and ‘off’ |
| gene | This unit of heredity is a sequence of DNA that contains instructions to build a particular molecular product, such as a protein. |
| growth hormone | hormone that stimulates cell growth |
| intron | a segment of a gene that is part of the primary transcript, but is removed by splicing machinery and is not included in mature mRNA |
| leucocyte | This cell of the immune system protects against disease. It is also referred to as white blood cell. |
| mediator | This regulating protein complex (multiple protein molecules) interacts with enhancer region on DNA and the transcription initiation complex formed prior to the start of transcription. |
| mRNA | messenger RNA: this copy of genetic instructions from DNA is carried to the cytoplasm and read by the ribosome to make a protein. |
| methylated cap | During transcription the 5’ end of messenger RNA is protected by addition of a 7-methylguanosin cap to the first transcribed nucleotide. |
| motif | specific nucleotide sequence recognised by regulating molecules, such as transcription factors |
| nucleotide | building block of DNA and RNA, made from a nitrogenous base (adenine, cytosine, thymine, guanine), five-carbon sugar, and one or more phosphate groups |

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| nucleus | membrane enclosed organelle found in eukaryotic cells containing most of the genetic material in the form of DNA |
| pathogen | disease-causing infectious agent such as a virus or parasite |
| polyadenylation | This addition of poly-A tail (long chain of adenine bases) to messenger RNA at the end of transcription protects mRNA from cellular breakdown. |
| promoter | region of DNA that RNA polymerase binds and initiates transcription |
| protein-coding gene | a genetic sequence that contains the instructions for making a protein |
| protein | These macromolecules of the cell consist of a folded chain of amino acids. |
| regulating proteins | proteins that regulate/control the expression of different genes within the cell |
| regulating sequences | These nucleotide sequences of DNA control the expression of different genes within a cell. |
| ribosome | This molecular machine formed from RNA reads instructions contained in messenger RNA to build an amino acid chain. |
| RNA | ribonucleic acid, single-stranded molecule transcribed from DNA |
| spliceosome | This complex of RNA and protein molecules removes introns from messenger RNA before translation. |
| splicing | process that removes introns from messenger RNA before translation |
| start codon | The start sequence of messenger RNA is the first codon of mRNA translated by the ribosome into an amino acid. This sequence specifies the start of translation. |
| stop codon | The stop sequence of messenger RNA is the final codon of mRNA translated by the ribosome into an amino acid. This sequence specifies the end of translation. |
| termination sequence | This specific nucleotide sequence marks the end of a gene and signals the end of transcription. |
| transcription factor | This protein molecule regulates gene expression by binding to specific nucleotide sequences on DNA, bringing RNA polymerase to the promoter. |
| transcription initiation complex | This complex of molecules forms prior to transcription beginning. |
| transcription | This decoding of DNA by RNA polymerase to make messenger RNA takes place in the cell nucleus. |
| transfer RNA | RNA molecule that carries amino acids to the ribosome during translation |
| translation | reading of messenger RNA by the ribosome to make an amino acid chain that forms a protein |

