

Examrace

Competitive Exams Botany Notes: Genetics: Transcription

Get unlimited access to the best preparation resource for UGC : Get [detailed illustrated notes covering entire syllabus](#): point-by-point for high retention.

What is Transcription?

Copying a gene as RNA

DNA-directed RNA synthesis from a gene

What is a gene?

- A sequence of DNA that is transcribed from specific start to specific stop base sequences.
- Beadle and Tatum, working with the eukaryote mold *Neurospora crassa*, concluded that one gene codes for one protein.

But what about genes that code for RNA's like rRNA and tRNA?

- A gene is a sequence of DNA that is transcribed into a single RNA as defined by specific start and stop sequences of bases.
- A cistron is synonymous with a gene. A polycistronic RNA results from the transcription of an operon. DNA replication, transcription and translation.

What's an operon?

- A genetic unit containing several genes with related functions: The bacterial operon for lactose (milk sugar) metabolism contains 3 genes coding for 3 different proteins.
- An operon is transcribed as a single unit, a polycistronic messenger RNA (mRNA) that codes for more than one gene product.

Name 4 types of RNA. What are their functions?

- mRNA, messenger RNA that is translated into protein
- rRNA, ribosomal RNA that, together with ribosomal proteins, forms a structural scaffold for the translation of mRNA, the ribosome
- tRNA, transfer RNA, a specific carrier of amino acids
- snRNA, small nuclear RNA involved in processing of mRNA in the nucleus

What is the major transcription enzyme?

- RNA polymerase, a DNA-directed RNA polymerase
- RNA synthesis is 5' to 3'

- substrates are ribonucleoside triphosphates (to make ribonucleic acid)
- begins at the promoter, 5' end of the gene
- processivity is very high, proceeds to 3' end of gene without stopping or falling off the gene
- proof reading by precise Watson-Crick base pairing, A = U and G = C
- Regulation of transcription of a gene is at the 5'-end of the gene at region (s) termed operators
- Transcription of some genes is constitutive = housekeeping genes
- Transcription of other genes is in response to a stimulus = inducible genes

What are exons and introns?

- exons are coding regions
- introns are non-coding regions of the mRNA transcript
- exons and introns are found in most, but not all, eukaryote genes
- introns have to be spliced out before the mRNA is translated
- splicing is by snRNA's acting as enzymes, or ribozymes, an example of the catalytic function of RNA

Developed by: [Mindsprite Solutions](#)