

Biology chapter 12 5 workbook answers

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What are three ways that proteins that bind to enhancer sequences of a gene can work to regulate gene expression? Proteins that bind to enhance sequences in a gene can regulate gene expression through three main mechanisms: activators, repressors, and coactivators or corepressors. Activators enhance gene expression by binding to the enhancer region of the gene and promoting transcription.

Which of the following are considered parts of the lac operon? Structure. Structure of lactose and the products of its cleavage. The lac operon consists of 3 structural genes, and a promoter, a terminator, regulator, and an operator. The three structural genes are: lacZ, lacY, and lacA.

How does lactose turn on the lac operon Quizlet? In the case of the lac operon, lactose is the inducer. If lactose is present, it binds to and inactivates the repressor by causing it to fall off the operator.

Are most eukaryotic genes controlled individually or as groups? Most eukaryotic genes are controlled individually and have regulatory sequences that are much more complex than those of the lac operon.

What do enhancers bind to in transcription? Enhancer sequences are regulatory DNA sequences that, when bound by specific proteins called transcription factors, enhance the transcription of an associated gene.

What are 3 ways that gene expression can be controlled within a cell? Thus a cell can control the proteins it makes by (1) controlling when and how often a given gene is transcribed (transcriptional control), (2) controlling how the RNA transcript is spliced or otherwise processed (RNA processing control), (3) selecting which completed mRNAs in the cell nucleus are exported to the ...

What are the three types of genes in the lac operon? The lac operon consists of three structural genes: lacZ, which codes for β -galactosidase, which acts to cleave lactose into galactose and glucose; lacY, which codes for lac permease, which is a transmembrane protein necessary for lactose uptake; and lacA, which codes for a transacetylase that transfers an acetyl group ...

What is the inducer molecule in the lac operon? In presence of lactose, allolactose; an isomer of lactose, binds to the repressor and causes an allosteric shift. The altered repressor cannot bind to the operator, allowing RNA polymerase to transcribe the lac genes. Thus, allolactose serve as inducer of lac operon.

What is the correct sequence of proteins found in the lac operon? Structure of the lac operon The lac operon contains three genes: lacZ, lacY, and lacA. These genes are transcribed as a single mRNA, under control of one promoter.

How does lactose turn on the lac operon? The lac operon in E. coli regulates lactose metabolism. It consists of three genes (lacZ, lacY, and lacA) and is controlled by a promoter, operator, and CAP site. Lactose presence triggers allolactose production, which inhibits the lac repressor, allowing transcription.

What is the role of transcription factors and enhancers in eukaryotic gene expression? In Summary: Eukaryotic Transcription Gene Regulation In addition to promoter sequences, enhancer regions help augment transcription. Enhancers can be upstream, downstream, within a gene itself, or on other chromosomes. Transcription factors bind to enhancer regions to increase or prevent transcription.

How is transcription of an operon activated by the CAP catabolite activator protein? Catabolite activator protein (CAP) must bind to cAMP to activate transcription of the lac operon by RNA polymerase. CAP is a transcriptional activator with a ligand-binding domain at the N-terminus and a DNA -binding domain at the C-terminus.

Where do activators bind? Most activators are DNA-binding proteins that bind to enhancers or promoter-proximal elements. The DNA site bound by the activator is referred to as an "activator-binding site".

What happens to lac repressors in E. coli when lactose is present? What happens to lac repressors in E. coli when lactose is present? It binds lactose which changes its conformation so that it no longer binds to DNA.

What serves as the repressor in the TRP operon? The trp operon responds to a repressor protein that binds to two molecules of tryptophan. When the tryptophan is plentiful, this repressor-tryptophan complex binds to the trp operator. This binding prevents the binding of RNA polymerase, so the operon is not transcribed (Fig. 3.20).

What is the difference between a silencer and a repressor? Silencer elements are classical, position-independent elements that direct an active repression mechanism, and NREs are position-dependent elements that direct a passive repression mechanism. In addition, 'repressors' are DNA-binding transcription factors that interact directly with silencers.

What is an operon in prokaryotic gene regulation? Bacterial Operons Are Coregulated Gene Clusters In addition to being physically close in the genome, these genes are regulated such that they are all turned on or off together. Grouping related genes under a common control mechanism allows bacteria to rapidly adapt to changes in the environment.

How is the regulation of gene expression in eukaryotes different from methods used by prokaryotes? Gene expression occurs at many stages in eukaryotic cells, whereas in prokaryotic cells, control of gene expression only occurs at the transcriptional level. This allows for greater control of gene expression in eukaryotes and more complex systems to be developed.

What is the best summary of gene splicing mechanisms? Gene splicing is a post-transcriptional modification in which a single gene can code for multiple proteins. Gene Splicing is done in eukaryotes, prior to mRNA translation, by the differential inclusion or exclusion of regions of pre-mRNA. Gene splicing is an important source of protein diversity.

Which type of mutation is due to random mistakes in replication? Errors in replication are a source of point mutations.

What is the difference between a gene mutation and a chromosomal mutation?

All mutations fall into two basic categories: Those that produce changes in a single gene are known as gene mutations. Those that produce changes in whole chromosomes are known as chromosomal mutations.

What are the three ways genes can be expressed and regulated?

In prokaryotic cells, there are three types of regulatory molecules that can affect the expression of operons. Activators are proteins that increase the transcription of a gene. Repressors are proteins that suppress transcription of a gene. Finally, inducers are molecules that bind to repressors and inactivate them.

What are the 3 major types of DNA binding proteins?

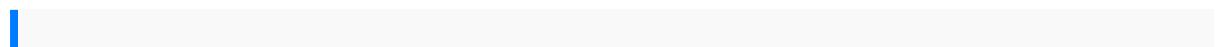
Examples of four major designs for DNA-binding domains are proteins with a helix-turn-helix domain, “zinc finger” domains, amphipathic helices (e.g., basic-zipper [bZip], HLH), and α -ribbon (prokaryotic proteins) (215) (Fig.

How do proteins regulate gene expression?

These proteins bind to regions of DNA, called regulatory elements which are located near promoters. The promoter is the region of a gene where RNA polymerase binds to initiate transcription of the DNA to mRNA. After regulatory proteins bind to regulatory elements, the proteins can interact with RNA polymerase.

What are the three common ways to stabilize protein structures?

The main forces which stabilize the secondary and tertiary structures of proteins are hydrogen bonds, disulphide linkages, van der Waals and electrostatic forces of attraction.



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