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Genetics is the study of genes, genetic variation, and heredity in living organisms. This online textbook covers major topics in molecular genetics in a problems-based approach. It grew out of teaching a course for upper level undergraduates and graduate students at the Pennsylvania State University.

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Chapter 2 covers the structures of nucleic acids (DNA and RNA) and methods for analyzing them biochemically. In addition, this chapter explores some of the insights into gene structure and function, especially in eukaryotes, that the use of these techniques has provided. This includes the separation of mRNA-coding regions into exons, production of multiple proteins from a single gene by differential splicing of the exons in RNA, and the duplication of genes to form gene families.

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Protein activity can be regulated by: • allostery • covalent modification • sequestration. Protein amount can be regulated by the rates of: • gene transcription • RNA processing • RNA turnover • mRNA translation • protein modification • protein assembly • protein turnover.

Unit IV: Regulation of Gene Expression

Protein activity can be regulated by: • allostery • covalent modification • sequestration. Protein amount can be regulated by the rates of: • gene transcription • RNA processing • RNA turnover • mRNA translation • protein modification • protein assembly • protein turnover.

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