



15. Protein structure

Topics: the central dogma of molecular biology, protein classification, protein constituents, the peptide bond and its properties, the four levels of protein structure, protein function regulation

16. Protein folding

Topics: How proteins acquire their final conformation and their functional properties after synthesis.

17. Chromatin and chromosomes

Topics: The organization of DNA in the cell nucleus, chromatin structure, histones and histone modifications.

18. Main classes of enzymes working on DNA

Topics: Enzymes hydrolyzing the ribose phosphate backbone, synthesizing phosphodiester bonds, modi





36. Human genome organization

Nuclear and mitochondrial genomes. The C-value paradox. Classes of repetitive DNA elements. Gene families. Organization of repetitive elements in the human genome. Segmental duplications.

37. How to analyze the genome

DNA sequencing from Sanger to today. Next-generation sequencing (NGS) 2nd and 3rd generation DNA sequencing. Short-read and long-read approaches.

38-39. NGS for the identification of the molecular basis of Mendelian diseases. From genome sequence to the causative variant

From candidate gene analysis to whole genome sequencing. Targeted resequencing vs whole genome sequencing. Exome sequencing: flowchart and examples on how to design a study. The big challenge to fish out the pathogenic variants. How to find a novel disease gene: from theory to practice.

40. Application of NGS to study the t



Teaching Methods

Fronctal lectures and flipped classes.

Verification of learning

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