

The biological tools of modern bioinorganic chemistry (KDIT67-eng)

Lecturer:

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Curriculum:

The overlap of the chemical and biological sciences - with focus on bioinorganic chemistry.

Examples of the role of the metalloenzymes, metalloproteins, and the “free” metal ions in industry, pharmacology and bioinorganic research.

The basics of recombinant gene technology.

DNA synthesis within the cell. Problem solving.

The polymerase chain reaction. Problem solving.

Design and synthesis of artificial DNA vectors. Plasmids, as DNA carriers. Bacteria in DNA cloning. Problem solving.

The analysis of DNA, nucleotide sequence determination. The genetic code. Problem solving.

The synthesis of proteins by chemical and biological, “in vivo” vs. “in vitro” methods. Problem solving.

The methods for purification of proteins. HPLC, antibody, metal ion-affinity chromatography. Problem solving.

Electrophoretic methods for studying proteins and DNA, and their interactions.

The study of the amino acid sequence. The calculation of the secondary structure. Investigation methods.

The determination and visualization of protein structure: theory and practice. Problem solving.

Applications: artificial metalloproteins, metalloenzymes. The different pathways of the enzyme or protein modifications, examples: design of new macromolecules.