Programs Final Examinasion on discipline «**Modern methods in biotechnology**

6M070100 Biotechnologyя»

**Modul 1 Methods to study subcellular structure**

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| Modern methods in study cell membranes»  Crude Isolation of Plant Plasma Membrane by Differential Centrifugation  Use of modern biotechnological methods in agriculture*.*  on Methods of determination of membrane stability.  Membranes and detergents. The method of solubilization of membranes. Use of detergents Use detergents in studycell membranes »  Determine selective protein precipitation methods*.* Describe factors affecting protein stability.  Present types of biophysical methods on study of membrane structures. Basic principles of chromotography »  Describe the methods of density gradient centrifugation by scheme |
| Present the method of solubilization of membranes. Use of detergents |
| Determine methods of isolation of proteins from membrane structures |
| Describe principles of methods of UV absorption and Folin-Ciocalteu or Lowry |
| Show using of gel electrophoresis |
| Compare using of equipments types in study of proteins by gel electrophoresis |
| Present the use of polyacrylamide gel electrophoresis in the presence of SDS in study of proteins |
| Describe principles of isoelectric focusing (IEF) to separate proteins based on their isoelectric points. |
| Determine principles of two-dimensional (2-D) gel electrophoresis |
| Present proteins detection following electrophoresis |
| Describe enzyme activity analysis by electrophoresis |
| Determine two-dimensional gel electrophoresis, their using and stages. |
| Show preparative gel electrophoresis in protein study. Calculation of molecular mass from SDS gels. |
| Present the methods of study of proteins separation according to distinct chemical properties |
| Describe methods in study of proteins separation according to distinct physical properties |
| Determine the use of methods of proteins concentration |
| Describe the criteria to evaluate the protein of interest during the  purification procedure. |
| Show strategies for the detection of acetylated proteins. |
| Present methods of confirmation of the presence of proteins (radioactive detection or immunodetection techniques) |
| Use of mass spectrometry as method to confirm the identity of the protein |
| How can use high performance (pressure) liquid Chromatography. Thin-layer chromatography (TLC) and paper chromatography |
| Describe ion exchange chromatography method |
| Present scheme of chromatofocusing method |
| Show method of gel filtration chromatography |
| Present principles of affinity chromatography method |
| Determine the principles of microscopy and its use for identification membrane structures |
| Determine mass spectrometric analysis of proteins |
| Describe immunohistochemically analysis in study of proteins |
| Describe types of microscopy and area of its use |
| Present centrifugation types and use of this method in different area of biotechnology |
| Describe staining methods to detect and analyze proteins |
| Show methods on determination of nucleic acid structure |
| Describe method of protein purification by precipitation and dialysis |
| Present principles of proteome analysis by mass spectrometry |