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Courses » Proteins and Gel-Based Proteomics

Announcements **Course** Ask a Question Progress

Unit 3 - Week-1: Basics of amino acids and proteins

Course outline

How to access the portal

Introduction to Gel-Based Proteomics

Week-1: Basics of amino acids and proteins

- L1. Introduction to amino acids
- L2. Introduction to proteins
- L3. Protein folding & misfolding
- L4. Protein purification techniques
- L5. Introduction to proteomics
- Lab Session-1.1: Demonstration of protein-protein interactions using label-free biosensors
- Week-1 Assignment Answer Key
- Quiz : Week-1 Assignment-1

Week-2: Gel-based proteomics and sample preparation

Week-3: Two-dimensional gel

Week-1 Assignment-1

The due date for submitting this assignment has passed. **Due on 2016-03-30, 23:45 IST.** As per our records you have not submitted this assignment.

1) You have accidentally mixed two unknown purified protein samples while working in lab. One of the proteins has a molecular weight of 50 kDa, whereas the other has a molecular weight of 470 kDa. Based on this information, which of the following chromatographic technique will you use to separate the two proteins? 0.5 points

- Reverse phase chromatography
- High performance liquid chromatography
- Gel permeation chromatography
- Ion-exchange chromatography

No, the answer is incorrect.

Score: 0

Accepted Answers:

Gel permeation chromatography

2) Which of the following method(s) can be used to determine the N-terminal sequence of proteins? 0.5 points

- Sanger method
- Edman reaction
- Mass spectrometry
- All of the above

No, the answer is incorrect.

Score: 0

Accepted Answers:

All of the above

3) Which of these amino acids has a good buffering capacity at physiological pH? 0.5 points

- Histidine
- Cysteine
- Tryptophan
- Proline

No, the answer is incorrect.

Score: 0

Accepted Answers:

Histidine

electrophoresis
(2-DE)

Week-4:
Difference gel
electrophoresis
(DIGE) & Mass
spectrometry

4) Which of the following charged group(s) will be present in Valine at a pH of 0.5 points
2?

- NH³⁺
- COO⁻
- NH²⁺
- a and b

No, the answer is incorrect.

Score: 0

Accepted Answers:

-NH³⁺

5) Which of the following statement is NOT true for protein folding? 0.5 points

- Once the protein is unfolded it is impossible for it to go back to its native state
- Protein folding of a protein is dictated by its primary structure
- No protein adopts only one conformation
- Protein folding is a cooperative process

No, the answer is incorrect.

Score: 0

Accepted Answers:

Once the protein is unfolded it is impossible for it to go back to its native state

6) Which of the following amino acid pairs have 2 chiral centres? 0.5 points

- Proline, Tyrosine
- Phenylalanine, Glycine
- Serine, Cysteine
- Isoleucine, Threonine

No, the answer is incorrect.

Score: 0

Accepted Answers:

Isoleucine, Threonine

7) You have a serum sample mixture from which you want to separate IgG. You know that IgG has very high affinity for Protein A. Which of these chromatography technique would you use to separate IgG from the complex mixture? 0.5 points

- Affinity chromatography
- Gel permeation chromatography
- Cation exchange chromatography
- Anion exchange chromatography

No, the answer is incorrect.

Score: 0

Accepted Answers:

Affinity chromatography

8) Which of the following is a clinical goal of proteomics? 0.5 points

- Biomarker Discovery
- Disease monitoring
- Identification of therapeutic targets
- All of above

No, the answer is incorrect.

Score: 0

Accepted Answers:

All of above

9) Which of the following reagent is used for disruption of disulphide bonds in proteins? 0.5 points



- SDS
- DTT
- Urea
- IAA

No, the answer is incorrect.

Score: 0

Accepted Answers:

DTT

10) Why is the peptide bond, which is thermodynamically unstable, resistant to spontaneous hydrolysis? 0.5 points

- Because of partial double character
- Because of zwitter-ionic nature of amino acids
- Presence of side chains
- None of the above

No, the answer is incorrect.

Score: 0

Accepted Answers:

Because of partial double character

11) Which of the following amino acid does not possess a chiral carbon centre? 0.5 points

- Histidine
- Cysteine
- Glycine
- Tryptophan

No, the answer is incorrect.

Score: 0

Accepted Answers:

Glycine

12) You have to perform binding studies of Hemoglobin with different ligands but the protein solution has impurities like dichromate ions, salts etc. These impurities may interfere with your binding studies and may give you false results. Which of the following chromatographic technique would be the preferred choice of method for protein purification? 0.5 points

- Reverse phase chromatography
- High performance liquid chromatography
- Gel permeation chromatography
- Ion-exchange chromatography

No, the answer is incorrect.

Score: 0

Accepted Answers:

Gel permeation chromatography

13) Which of the following amino acids is most likely to be present in the inner core region of proteins? 0.5 points

- Lysine
- Valine
- Glutamic acid
- Asparagine

No, the answer is incorrect.

Score: 0

Accepted Answers:

Valine



14) Which of the following amino acid would you expect in relatively large number in histones? Remember that histones are highly alkaline proteins with very high pI values. 0.5 points

- Lysine
- Methionine
- Tyrosine
- Proline

No, the answer is incorrect.

Score: 0

Accepted Answers:

Lysine

15) Which of these amino acid can undergo phosphorylation in its side chain group? 0.5 points

- Proline
- Threonine
- Alanine
- Methionine

No, the answer is incorrect.

Score: 0

Accepted Answers:

Threonine

16) Which of the following statements is TRUE for the two label-free interaction technologies e.g. Surface Plasmon Resonance (SPR) and Bio-layer Interferometry (BLI)? (Note: Question 16-20 are Lab session based questions) 0.5 points

- SPR has fluidic system whereas BLI does not
- BLI has fluidic system whereas SPR does not
- Both techniques have fluidic system
- None of them has fluidic system

No, the answer is incorrect.

Score: 0

Accepted Answers:

SPR has fluidic system whereas BLI does not

17) In Bio-layer Interferometry (BLI) when there is an interaction between two molecules, how does the shape of curve changes? It.. 0.5 points

- goes down.
- rises up.
- becomes linear.
- becomes hyperbolic.

No, the answer is incorrect.

Score: 0

Accepted Answers:

rises up.

18) Interaction studies using label-free platform are advantageous over other techniques because they? 0.5 points

- Overcome the issue of non-specific binding in labels
- Involve real time approach
- Provide kinetic information
- All of the above

No, the answer is incorrect.

Score: 0

Accepted Answers:



All of the above

19 The basic principle of Bio-layer Interferometry (BLI) technique is based on which of the following phenomenon? 0.5 points

- Diffraction
- Polarisation
- Refraction
- Interference

No, the answer is incorrect.

Score: 0

Accepted Answers:

Interference

20 Complex proteomics studies unravelling the physiological pathways are very crucial if we are mapping protein-protein interaction networks. Which of the following method is NOT used for protein-protein interaction studies? 0.5 points

- Surface Plasmon Resonance (SPR)
- Bio-layer Interferometry (BLI)
- Protein microarray
- SDS-PAGE

No, the answer is incorrect.

Score: 0

Accepted Answers:

SDS-PAGE



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