

## Unit 7 - Week-6: Basics of mass spectrometry and sample preparation

### Course outline

#### How to access the portal ?

#### Week-1: Basics of proteins and proteomics

#### Week-2: Gel-based proteomics

#### Week-3: Two-dimensional gel electrophoresis (2-DE)

#### Week-4: Difference in gel electrophoresis (DIGE) & Systems Biology

#### Week-5: Basics of mass spectrometry

#### Week-6: Basics of mass spectrometry and sample preparation

#### L26. MALDI sample preparation and analysis

#### L27. Hybrid mass spectrometry configurations

#### L28. Lab session - Demonstration of Q-TOF MS technology

#### L29. In-gel & in-solution digestion

#### L30. Lab session - Sample preparation: tissue sample preservation technology

#### Download Videos

#### Weekly Feedback

#### Quiz : Week-6 Assignment

#### Week-7: Quantitative Proteomics

#### Week-8: Advancement in Proteomics

#### Text Transcripts

## Week-6 Assignment

The due date for submitting this assignment has passed.  
As per our records you have not submitted this assignment.

**Due on 2019-10-09, 23:59 IST.**

Week-6 Assignment

1) Mehar wants to study proteomics of a sample X. She extracted protein from sample X and submitted to mass spectrometer central facility at IIT Bombay. What is the correct order of steps she might have performed before submitting sample to the facility? **1 point**

- A. Tryptic digestion  
B. Reduction and alkylation  
C. Desalting of the sample  
D. SDS-PAGE for the quality check

- A,B,C,D  
 D,A,C,B  
 B,D,C,A  
 D,B,A,C

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
D,B,A,C

2) What is the advantage of using Chip-based nano liquid chromatography? **1 point**

- Low sample volume  
 High reproducibility  
 Reduced peak dispersion  
 All of the above

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
All of the above

3) SDS-PAGE profile of a drug treated cell lysate shows a very dark band at 37 kDa region. Which of the following methods would you follow to identify protein present on the mentioned region? **1 point**

- In solution digestion  
 DIGE  
 In gel digestion  
 Immunoblot

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
In gel digestion

4) Why is Acetonitrile used in In-gel digestion of protein? **1 point**

- To reduce protein disulfide bond  
 To elute protein out of the gel  
 To reduce CBB-protein interaction  
 To break peptide bond

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
To reduce CBB-protein interaction

5) In triple quadruple mass spectrometer, Q1 usually operates in which mode? **1 point**

- Scanning  
 Radiofrequency  
 Reflectron  
 None of the above

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Scanning

6) Given below is a link for an MS/MS file generated using Q-TOF MS system. **1 point**

<https://drive.google.com/file/d/1GHMm2us5yVoXIFvRQZLaeNs6o6Z8xKKk/view?usp=sharing>

Please analyze the file using online MASCOT server and answer the questions from 6-10 using the parameters as shown below.  
[http://www.matrixscience.com/cgi/search\\_form.pl?FORMVER=2&SEARCH=MIS](http://www.matrixscience.com/cgi/search_form.pl?FORMVER=2&SEARCH=MIS)

### MASCOT MS/MS Ions Search

How many total significant hits were observed in the Mascot score histogram?

- 1  
 2  
 3  
 4

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
1

7) What is the score obtained for the search? **1 point**

- 88  
 93  
 73  
 83

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
83

8) What is the name of the identified protein? **1 point**

- Fructose-bisphosphate aldolase 2  
 Hexokinase  
 Pyruvate dehydrogenase  
 Isocitrate dehydrogenase

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Fructose-bisphosphate aldolase 2

9) To which organism the protein belongs? **1 point**

- Human  
 Bovine  
 Arabidopsis thaliana  
 Rabbit

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Arabidopsis thaliana

10) Which database is used here for protein identification? **1 point**

- Swissprot  
 Uniprot  
 Human EST  
 cRAP

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Swissprot