

## Unit 7 - Week 5

Course outline
How does an NPTEL online course work?
Week 0
Week 1
Week 2
Week 3
Week 4
Week 5
<ul style="list-style-type: none"> <li>Lecture 21 : Antigen recognition by T cell : major histocompatibility complex ( Contd. )</li> <li>Lecture 22 : Antigen recognition by T cell : major histocompatibility complex ( Contd. )</li> <li>Lecture 23 : The Generation of <math>\alpha</math> : <math>\beta</math> T - Cell receptor ligands</li> <li>Lecture 24 : The Generation of <math>\alpha</math> : <math>\beta</math> T - Cell receptor ligands ( Contd. )</li> <li>Lecture 25 : Summery of Immune system</li> </ul>
<input type="radio"/> Quiz : Assignment 5
<input type="radio"/> Week 5 Feedback Form
Week 6
Week 7
Week 8
Week 9
Week 10
Week 11
Week 12
Download Videos
Assignment Detailed Solution
Text Transcripts
Live Interactive Session

## Assignment 5

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

**Due on 2020-10-21, 23:59 IST.**

- 1) A T-cell recognizes antigen as a peptide bound by a particular allelic variant of an MHC molecule, and will not recognize the same peptide bound to other MHC molecules. This behaviour of T cells is called
- MHC restriction
  - Polymorphism
  - Polygeny
  - None
- a.  
 b.  
 c.  
 d.
- No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
a.
- 2) Diversity of MHC molecules seen both within an individual and in the population is due to the
- polymorphism only
  - polygeny only
  - combination of both polymorphism and polygeny
  - V, D and J recombination
- a.  
 b.  
 c.  
 d.
- No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
c.
- 3) Which of the following is correct with respect to T cell activation?
- Superantigens need to be processed by endogenous pathway
  - Superantigens need to be processed by exogenous pathway
  - Superantigens do not require any processing
  - Superantigens can be processed by either endogenous or exogenous pathway
- a.  
 b.  
 c.  
 d.
- No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
c.
- 4) The recognition of target cell by CD8 cytotoxic cells is
- MHC independent
  - MHC I restricted
  - MHC II restricted
  - Both MHC I and MHC II restricted
- a.  
 b.  
 c.  
 d.
- No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
b.
- 5) Generation of antigenic peptide for MHC class I occurs in
- Rough Endoplasmic reticulum
  - Cytosol
  - Golgi apparatus
  - Endosome
- a.  
 b.  
 c.  
 d.
- No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
b.
- 6) Choose the correct combination from panel I and panel II
- | Panel I   | Panel II  |
|---|---|
| I. TAP<br>II. Tapasin<br>III. ERp57<br>IV. Calnexin | A. breaks and reforms disulphide bonds in the MHC class I $\alpha$ domain during peptide loading<br>B. moves peptide into ER<br>C. retains the MHC class I molecules $\alpha$ chain in a partially folded state<br>D. forms a bridge between the MHC class I molecule and the TAP complex |
- I-B, II-D, III-C, IV-A
  - I-B, II-D, III-A, IV-C
  - I-D, II-B, III-A, IV-C
  - I-C, II-D, III-A, IV-B
- a.  
 b.  
 c.  
 d.
- No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
b.
- 7) Antigen binding with MHC II molecule is mediated by
- Cathepsin-S
  - CLIP
  - HLA-DM
  - Peptidyl-transferase
- a.  
 b.  
 c.  
 d.
- No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
c.
- 8) Three major cell types, dendritic cells, macrophages, and B cells, present peptides bound to MHC class II molecules for recognition by CD4 T cells. In general, these peptides are derived from proteins or pathogens taken up by the cell by endocytosis, phagocytosis, or macropinocytosis. Based on these pathways of antigen uptake, some of the enzymes that degrade proteins to generate peptides for MHC class II presentation are:
- Ubiquitin ligases that tag proteins for degradation by the proteasome
  - ATP transporter proteins that deliver endocytic proteins into the cytosol for degradation
  - Cysteine proteases like cathepsins that function at acidic pH
  - The lysosomal thiol reductase found in the endosomes
  - The lysosome-associated membrane trafficking protein, LAMP-2
- a.  
 b.  
 c.  
 d.  
 e.
- No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
c.
- 9) During MHC class I synthesis and folding in the endoplasmic reticulum (ER), a process of peptide editing takes place as the newly synthesized MHC class I protein is held in a 'peptide receptive' state by binding to the calreticulin:ERp57:tapasin complex. Peptide editing ensures that the MHC class I molecules that reach the cell surface have stable, high affinity binding for their peptide cargo. Peptide editing is important to the immune response because it:
- Maintains high levels of surface MHC class I expression
  - Ensures that MHC class I molecules are not degraded in the ER
  - Retains the nascent MHC class I molecule in a peptide receptive state
  - Allows surface MHC class I molecules to bind new peptides from the extracellular milieu
  - Prevents surface MHC class I molecules from undergoing peptide exchange at the cell surface
- a.  
 b.  
 c.  
 d.  
 e.
- No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
e.
- 10) Choose the correct statements about  $\delta$ : $\gamma$  T cell receptor
- recognize antigen as peptides presented by MHC molecules
  - recognize their target antigens directly
  - not restricted by the 'classical' MHC class I and class II molecules
  - both b and c
  - both a and c
- a.  
 b.  
 c.  
 d.  
 e.
- No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
d.