BITS PILANI, DUBAI CAMPUS
DUBAI INTERNATIONAL ACDEMIC CITY
FIRST SEMESTER 2011-2012
COMPREHENSIVE EXAMINATION

COURSE NO. BIOT C463 12-1- 2012 MAXIMUM MARKS: 40
COURSE NAME; INTRODUCTION TO IMMUNOLOGY &IMMUNOTECHNOLOGY DURATION: 3 Hours

Q1. (i) Briefly explain the technique Radioimmunoassay (List out the steps) and its 3 major applications (2)

(ii) What do you understand by Immunoflourescence? List out the different types .Which one is more preferred and why? (3)

(iii) What is Immunoprecipitation? For which purpose it is used? List out its various types and applications in research. (2)

(iv) What is bone marrow transplantation? What are the potential problems faced during such transplantations (any 2)? What could be the possible solution to overcome the same? (2)

Q2. (i) Cancer-associated genes can be divided into three categories that reflect different activities, list out those categories and explain their activities. (2)

(ii) What is the difference between monoclonal and polyclonal antibodies? What is the goal of polyclonal antibody production? .List out the steps in production of monoclonal antibodies. (2)

(iii) How do the viruses become successful in evading the host immune mechanism and cause disease? Explain (2)

(iv) What is the difference between Tolerance and autoimmunity? Failure of tolerance leads to autoimmunity, Justify (2 Points) (3)

iv) List out the different pathways of complement activation, major step common for all the pathways .Also Mention the components of each of these pathways. (2)

Q3 (i) Compare and contrast the structure of Class I and Class II MHC Molecules (2)

(ii) Give a schematic presentation for the antigen processing and presentation pathway in the cells expressing class II MHC. (3)

(iii) How CTLs Kill the target cell? Explain (2)

(iv) Is there any correlation between Bacterial Sepsis and cytokines? Justify. (2)

Q4.(i) What is the role of Bcl2 and Bcl-X in apoptosis .Explain (2)

(ii) What is the correlation between Age, Size of thymus and immune function? Explain (1)

(iii) List out the major antibodies and their properties in a tabular form. (2.5)

(iv) What are Adjuvants? List out various effects of adjuvants? (1.5)

Q5. (i) List out the various steps in phagocytosis of invading microbes. (1)

(ii) How Combinatorial diversity can help in generating diverse antigen binding specificities in antibodies, explain with an example. (2)

********** GOOD LUCK **********

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TEST -2 (OPEN BOOK)

COURSE NO. BIOT C463 27-12- 2011 MAXIMUM MARKS: 20
COURSE NAME; INTRODUCTION TO IMMUNOLOGY &IMMUNOTECHNOLOGY DURATION: 50 Mins

Q1. (i) Antigen presenting cells express both class I and Class II MHC molecules ,how does the Class II MHC molecules are prevented from binding to same set of antigenic peptides as class IMHC and vice a versa (3)

(ii) Why an IgM molecule flowing in blood not activate Complement (3)

(iii) An inbred strain of mouse strain A is grafted with skin from strain B and get rejected in 12 -14 days ,whereas when a second strain B is transferred to a previously grafted strain A mouse, the graft gets rejected more quickly ,Why ? What type of cells play major cells in such cases? (2)

Q2.(i) There are thousands of peptides which are formed in the system , How does the binding of peptides of exact sized peptide length in the peptide binding cleft is ensured Explain. (2)

(ii) What is the biological significance of MHC? Explain with an example (2)

(iii) How does certain drugs when given to patients inhibit the signal transduction, explain with an example. (2)

Q3.(i) Normally the CTL mediated killing is done by Perforins and Granzymes but some cells lack these ,How do such CTL's kill the target cell ? Explain the mechanism. (3)

. (ii) Complement system is non specific and is potentially self damaging besides microorganisms, how the autologous cells are protected from complement attack? Explain with an example (3)

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TEST -1(CLOSED BOOK)

COURSE NO. BIOT C463 3-11- 2011 MAXIMUM MARKS: 25
COURSE NAME; INTRODUCTION TO IMMUNOLOGY &IMMUNOTECHNOLOGY DURATION: 50 Mins

Q1. (i) Defects in the complex regulatory network governing the expression of Cytokines and cytokine receptors are responsible for many diseases .Justify your answer with an example (3)

(ii) Explain the mechanism by which the Cytokine receptors transduce the signal (2)

Q2.Differentiate between the following

(i) Productive and non productive gene arrangements
(ii) Conventional T dependent antigens & super antigen
(iii) Immunogen & Hapten
(iv) Epitope & Paratope

(4)

Q3.(i) From the information given below , show the arrangement of gene segments present in heavy and light chain gene families .List out the steps when the genes rearrange & express to generate the primary transcript (5)

$V_1, V_2 \ldots V_n$, J_1, J_2, J_3 J_4 J_5 and C_k, C

(ii) List out the various factors that affect Immunogenicity (2)

Q4. (a)Briefly describe the role of the following:

(i) Leader Sequence
(ii) RSS
(iii) RAG1-RAG2

(3)

. (b) How the quality control of antibody is ensured during antibody sysntheis? Explain (1)

(c) Briefly explain the mechanism of Allecic exclusion (2)

Q5List out the main properties of the most versatile Immunoglobulin found in your body and why it is called so? (3)

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QUIZ-1

COURSE NO. BIOT C463 3-10- 2011 MAXIMUM MARKS: 8
COURSE NAME; INTRODUCTION TO IMMUNOLOGY &IMMUNOTECHNOLOGY DURATION: 20 Mins

Q1. (i) Why is Human skin resistant to colonization by *E.coli* despite constant exposure to it? (0.5)

(ii) How do C reactive proteins help in defending the body against infection? List out the steps ? (1.0)

(iii) List out the various steps in the Leukocyte extravasations (0.5)

(iv) What happens in Di-George syndrome? (0.5)

Q2.

(iii) Differentiate between:

(a) PAMP & PRR with example

(b) Innate and adaptive immunity (3 major differences)

(c) Major types of cell surface PRR giving one example

(d) Primary and secondary lymphoid organs (Examples &Major function)

(1x4)

Q3. (i) What are the different regions found in Toll like receptor? List out the various? steps in TLR signal transduction pathway. (1)

(iii) What are M cells? (0.5)

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