

Birla Institute of Technology & Science, Pilani

Mid Semester Examinations

Molecular Immunology (BIO G 514) Time: 90 M Marks : 30

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**Please answer in the sequence provided.**

All questions are for equal marks

- 1) Distinguish between innate and adaptive immunity.
- 2) Which is the “cardinal feature” of the adaptive immune response, which prevents the components of the same from reacting with the body’s own molecules? Justify your answer.
- 3) Write short notes on
  - a) Plasmacytoid DC’s
  - b) Neutrophils
  - c) Allotypes
- 4) Based on your understanding of the molecular interactions in the lymph nodes, explain the possible observations in the case of a) CXCR5 knockout and b) CCR7 knockout mice. 1.5
- 5a) Describe the movement of T cells after entry into a lymph node. 1.5
- 5b) Explain with the aid of diagrams the mechanisms involved in the migration of monocytes to sites of infection.
- 6) Why are T cells, which recognize their specific ligands, retained in the lymph node? Why do effector T cells finally exit the lymph nodes? Explain the molecular basis behind the same with reasoning.
- 7) Where are the TLR 3 receptors located in a cell? Explain briefly the process of intracellular signaling leading to the activation of regulatory factors when these bind to their appropriate ligands. Use diagrams to explain your reasoning.
- 8) If the FcRn receptor was compromised by mutations would there be any effect on the half life of any of the antibody classes? Explain your viewpoint with reasons.
- 9) Why can weak affinity antibodies sometimes exhibit a significantly higher avidity?
- 10) What could happen in antigen presentation to T cells if the gene for the invariant chain was, knocked - out in a mouse?