

UNIVERSITY COLLEGE LONDON

University of London

EXAMINATION FOR INTERNAL STUDENTS

For the following qualifications :-

B.Sc. (Intercal)

Immunology C313: Selected Topics in Immunology and Cell Pathology

COURSE CODE : **IMMNC313**

UNIT VALUE : **0.50**

DATE : **14-MAY-02**

TIME : **10.00**

TIME ALLOWED : **2 hours**

02-C0775-3-30

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TURN OVER

SELECTED TOPICS IN IMMUNOLOGY C313

Candidates must write **TWO essays** and **FOUR short notes**.

Each essay should come from a different week of the course.

At least one, and not more than two, short notes should come from each week of the course.

You should take approximately **30 minutes for each essay** and approximately **15 minutes for each short note**.

Please answer **each essay question in a separate book and write the question number clearly on each front page**.

Please use the single sheets of paper provided for your short notes. **Answer each of these on a new sheet of paper. Write your candidate number and the question number at the top of each sheet.**

The fraction of the marks allocated to each section is as follows:

Section A: 60/120
(**essay**, 2 out of 6)

Section B: 60/120
(**short notes**, 4 out of 12)

The in-course assessment constituted 15% of the final mark.

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SECTION A

Choose **TWO** titles from the list below.

Each essay must be chosen from a different week.

Week One: Chronic Infection

1. Why is the regulation of cytokine responses so important in determining the outcome of malaria infection? How is this achieved?
2. Describe the immune response to herpes simplex virus.

Week Two: Immunodeficiency

3. How can the immune defects in patients with SCID be corrected?
4. How does HIV (human immunodeficiency virus) damage the immune system?

Week Three: Allergy

5. How might mechanisms of immediate type hypersensitivity in the skin predispose to the evolution of chronic T cell mediated inflammation.
6. How can the immune system be manipulated to control atopic reactivity.

Week Four: Autoimmunity

7. What is the nature of the immunological attack in rheumatoid arthritis.
8. To what extent have animal models of endocrine autoimmune diseases provided an understanding of their human counterparts?

Week Five: Transplantation

9. How do allogeneic transplantation antigens induce immune responses that lead to graft rejection?
10. How do tacrolimus (FK506) and sirolimus (rapamycin) differ in their immunosuppressive action and what role does their common binding to FKBP (FK506 binding protein) play?

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Week Six: Chronic Immunity & Inflammation

11. Why do we see areas of necrosis in chronic inflammatory lesions? Describe any one disease condition where this is a prominent feature.
12. What is the role of the endothelial cell in chronic disease?

Week Seven: Neoplasia

13. How have epidemiological studies helped us to understand the features of cancer of the uterine cervix?
14. What are the biological consequences of DNA damage by alkylating agents?

Week Eight: Tumour Immunology

15. Describe mechanisms by which chromosomal translocation may lead to uncontrolled lymphoproliferation.
16. How may potentially immunogenic tumours evade elimination by the immune system?

SECTION B

Write short notes on **FOUR** of the following. Each short note must be from a different week.

Week One: Chronic Infection

- 1a. Evasion of NK cell lysis by CMV infected cells.
- 1b. How intracellular Leishmania modifies the function of macrophages.
- 1c. Techniques commonly employed to monitor the cellular immune response to viruses.
- 1d. T cell recognition of Mycobacterial antigens.

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Week Two: Immunodeficiency

- 2a. CVID (Common Variable Immunodeficiency).
- 2b. Give two examples of immune defects affecting the innate immune system and explain how these defects give rise to disease.
- 2c. Describe the signalling defects and consequences of common gamma chain mutations.
- 2d. Hyper IgM.

Week Three: Allergy

- 3a. Bronchial hyper-reactivity.
- 3b. Genetic factors in asthma.
- 3c. Exclusion diets.
- 3d. Anaphylaxis.

Week Four: Autoimmunity

- 4a. The relative incidence of autoimmune diseases in males and females.
- 4b. The concept of molecular mimicry.
- 4c. The role of dendritic cells in thymic education.
- 4d. Cytokine defects leading to autoimmunity.

Week Five: Transplantation

- 5a. Causes of hyperacute rejection.
- 5b. What is graft versus host disease?
- 5c. Outline the pros and cons of methods for typing histocompatibility antigens.
- 5d. What are immunologically adverse effects of transplant immunosuppression?

CONTINUED

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Week Six: Chronic Immunity & Infection

- 6a. Pulmonary fibrosis.
- 6b. Genetic factors in cardiovascular disease.
- 6c. Animal models of arthritis.
- 6d. The features of cerebral amyloidosis.

Week Seven: Neoplasia

- 7a. Advantages of gene therapy in treatment of cancer.
- 7b. "Adult stem cells are more flexible than was previously thought". Comment on this statement.
- 7c. How do cancer cells override cell cycle regulation in the G1 phase?
- 7d. Define what is meant by the terms hyperplasia, dysplasia, metaplasia and neoplasia.

Week Eight: Tumour Immunology

- 8a. How are cancer markers used to monitor disease?
- 8b. Why do foetal antigens reappear on cancers and could they be used as targets for a protective immune response?
- 8c. How can antibodies be used to treat cancer?
- 8d. What properties do dendritic cells have to make effective primers of anti-cancer immune responses?

END OF PAPER