◨ NTNU

Faculty of Medicine
Department of Laboratory Medicine, Children's and Women's Health

WRITTEN EXAMINATION:
MOL3005 Immunology

Wednesday June 8th 2011, 9.00 am - 1.00 pm

ECTS credits: 7.5
Number of pages (including front-page): 3

Examination support: Language dictionary (Medical dictionaries or similar dictionaries on biology are not permitted).

Contact person during the exam: Trude Helen Flo, 91897796 / 72825331

Exam results: 29th of June, 2010
Examination results are announced on http://studweb.ntnu.no/

Examination question 1 (18 points).

a) List the major leukocytes and their primary functions

b) Briefly describe the physical /chemical barriers of host defense

Examination question 2 (14 points).

a) Define monoclonal and polyclonal antibodies

b) What are the advantages and the disadvantages with monoclonal and polyclonal antibodies when used as immunological tools?

c) Draw and explain the principle of Enzyme-Linked ImmunoSorbent Assay (ELISA). Give an example on how it can be used in the clinics.

Examination question 3 (30 points).

a) What molecules are presented on MHCI, MHCII and CD1, respectively? Which cells express these surface receptors?

b) Draw a schematic and briefly explain the process of antigen presentation on MHCI and MCHII.

c) What is cross-priming?

d) Explain briefly how naïve T-cells are activated by dendritic cells?

e) List T-cell subsets with characteristic receptors (to discriminate/identify them), main function and cytokine(s) secreted

Examination question 4 (18 points).

a) List the (seven) hallmarks of cancer

b) Briefly describe a proto-oncogene and a tumour suppressor gene

c) What are the differences between tumour specific and tumour associated antigens?

Examination question 5 (20 points).

a) Describe shortly how and where B-cells are activated by thymus-dependent antigens and progress to effector cells.

b) Describe the cellular process of apoptosis; why it is important, molecular mechanism of <u>one</u> chosen pathway, and how apoptotic debris is removed