UNIVERSITY COLLEGE LONDON

University of London

EXAMINATION FOR INTERNAL STUDENTS

For the following qualifications :-

B.Sc. (Intercal)

Surgery 1: Cancer Research

COURSE CODE	:	**SURG0001**
UNIT VALUE	:	**0.50**
DATE	:	**30-APR-02**
TIME	:	**10.00**
TIME ALLOWED	:	**3 hours**

TURN OVER

UNIVERSITY OF LONDON
(University College London)

BSc Degree 2002

TUMOUR BIOLOGY SURG 0001: CANCER RESEARCH

30th April 2002: 10.00 to 13.00

Answer Sections A, B and C: 6 questions from 3 sections

Please answer each Section in a separate answer book

You should allow about 1 hour for each Section

Marks allocated equally between Sections

SECTION A Answer **ONE** of the following three questions

A1 Explain the purpose and value of the histopathological diagnosis of human tumours. How has it been complemented by the use of newer tissue-based technologies over the past 25 years? Discuss whether such changes have been, or are expected to be, worthwhile.

A2 Discuss briefly the advantages and drawbacks of in vivo models in cancer research and give examples of the various ways in which they can be used.

A3 How have our concepts of cancer through history been influenced by observation, experimentation and the technologies available at the time?

SECTION B Answer **TWO** of the following four questions

B1 You are an oncologist with an interest in colorectal cancer. In your newly acquired laboratory you have a CO2 incubator and a Class II safety cabinet. You can also afford EITHER a flow cytometer OR a photometric multiwell plate reader on your major equipment grant.
List the consumables required and outline the principles and design of experiments to investigate **one** relevant property in a novel anthracycline-like compound.

B2 You have a tumour cell line which you hypothesise is angiogenic. Describe **one** *in vivo* and **one** *in vitro* experiment to test your hypothesis. In each case, explain the controls you would use and how you would quantitate the data.

B3 Describe how you would produce a monoclonal antibody to protein X and characterise the antibody.

What are the differences between monoclonal and polyclonal antibodies? A monoclonal antibody is usually the preferred choice, but give a reason why in some circumstances it may be advantageous to use a polyclonal antibody.

B4 You wish to determine the chromosome on which a mutation lies and then identify the mutation and determine if there is a change in the level of protein expressed.

For **each** of the following objectives, name **one** experimental technique and briefly describe the methodology:
a) to identify the chromosome
b) to identify the mutation
c) to determine if the protein is produced.

SECTION C Answer **THREE** of the following five questions

C1. What determines a 'significant' result ?

C2. What are the distinguishing features of Phase I, II and III clinical trials? Phase IV is a term also used: what is learned during this stage of drug development?

C3. Write short notes on **two** of the following:

a) single radial immunodiffusion
b) cell separation by density gradient
c) radioimmunoassay

C4. Distinguish between the immune status of nude and SCID mice. How do these differences alter host permissiveness to xenografts?

C5. Write short notes on **two** of the following:

a) PCR
b) aberrant crypt foci
c) the three 'R's of the ethics of animal experimentation

END OF PAPER