6 Bioassays of hormones

7 Effect of drug on behaviour of rat/mice

8 Study of imprinting in birds.

9 Study of primate behaviour in surrounding areas of Udaipur.

10 Maternal behaviour of rat/mice

11 Exercise of Molecular Biology/ Estimation of DNA

M.SC. (FINAL) ZOOLOGY - 2006-07

PAPER-III

ELECTIVE PAPER GROUP-I (Molecular Cell Biology stream)

CANCER BIOLOGY AND TUMOUR IMMUNOLOGY

Duration : 3 hours **M.M.100 Marks**

UNIT - I

1 Development and causes of cancer : General idea about neoplasm, benign and malignant tumours, metastasis, properties of cancer cells.

2 General idea about oncoviruses : Hepatitis B virus, SV40 and Polyomavirus, Papilloma viruses, Adenoviruses, Herpesviruses, Retroviruses.

3 Oncogenes and cancer induction : conversion of proto-oncogenes to oncogenes, oncogenes and human cancer, functions of oncogene products.

UNIT- II

4 Tumour suppressor genes : Identification of tumour suppressor genes, functions of tumour suppressor gene products, roles of oncogenes and tumour suppressor genes in tumour development.

5 Induction of cancer : A multistep process; Transformation in culture.

6 Mutations and loss of cell-cycle control: passage

and tumour suppressor genes; loss of tumour derived growth factor b (TGF b), signaling and malignancy.

UNIT - III

7 Mutation affecting genome stability :

(i) Proteins encoded by DNA tumour viruses and inhibition of p^{53} gene

(ii) Human carcinogens and inactivation mutations in the p^{53} gene

(iii) Defect in DNA repair systems in certain cancers

(iv) Common chromosomal abnormalities in human tumours

(v) Telomerase expression and immortalization of cancer cells

8 Chemicals, industrial processes and industries associated with cancers in human (only brief account) as given in the monograph published by International Agency for Research on cancer.

9 Apoptosis and cancer. Genes regulating apoptosis. The biochemistry of apoptosis.

UNIT - IV

10 Tumours of immune system : Lymphomas and

11 Tumour antigens : Tumour- specific transplantation antigens (TSTAs); Tumour associated transplantation antigens (TATAs), oncofetal tumour antigens (alpha - fetoprotein and carcinoembryonic antigen only).

12 Immune response to tumours : Role of natural killer (NK) cells and macrophages, immune surveillance theory.

UNIT - V

13 Tumour evasion of the immune system : Immunologic enhancement of tumour growth. Modulation of tumour antigens, reduction in class I MHC molecules, lack of co-stimulatory signals.

14 Cancer immunotherapy : Manipulation of co-stimulatory signal, enhancement of antigen presenting cell (APC) activity, cytokine therapy, interferons, tumour necrosis factors. *In vitro* activated lymphokine activated killer (LAK) and tumour infiltrating lymphocytes (TIL) cells.

15 Monoclonal antibodies and treatment of cancer. Tumour associated antigens under examination as potential targets for monoclonal antibody therapy.

16 Brief idea about cancer vaccines.

REFERENCE BOOKS (LATEST EDITIONS):

1. De Vita, V.T.,S.Hellman and S.A. Rosenberg, Cancer Principles and Practice of oncology, 5th