

S U M M A R Y.

Chemotherapeutic and biochemical properties of certain antitumour antibiotics on some transplanted mice tumours have been studied in this thesis. The drugs are : (1) Jawaharene, (2) Mitomycin C and (3) Actinomycin D. Of these, Jawaharene and Mitomycin C have been used widely.

Jawaharene has been isolated from a pigment produced by cultures of Aspergillus Niger. Mitomycin C and Actinomycin D have been obtained from strains of Streptomyces Caespitosus and Streptomyces Antibioticus respectively.

Jawaharene used in these experiments are not yet very pure, and its chemical identity is still unknown. Mitomycin C and Actinomycin D have been isolated in pure form and their chemical structures are known. The former is insoluble in water but soluble in Ethyl Oleate where as the later two are fairly soluble in water.

Investigations were carried out with the transplanted tumours of mice such as : a) M.F.S., b) S.L.T. and c) Ehrlich Ascites cells.

Effects of these Antibiotics on the metabolism of these tumours i.e. aerobic and anaerobic glycolysis etc. were studied. Chemotherapeutic studies of these antibiotics on the mice tumours were also investigated; their effect on the incorporation of

labelled carbon from acetate and glucose to proteins of these types of malignant cells had also been studied.

i) Histological studies of normal muscle tissue and two tumour tissues namely S.L.T₂ and M.F.S₂ were studied.

ii) Tumour homogenate showed higher rate of aerobic and anaerobic glycolysis than some normal tissues.

iii) The respiration of M.F.S₂ cells was inhibited by addition of glucose and fructose and increased by addition of malate, lactate, oxalacetate and pyruvate.

The glycolysis of M.F.S₂ cells was increased with addition of glucose, fructose and glucose-6-PO₄. When pyruvate was added along with glucose or fructose then the level of glycolysis was much higher.

iv) Jawaharene showed inhibitory effect on the respiration and glycolysis of Ehrlich Ascites cells and its effect was compared with that of two well known antibiotics, namely Mitomycin C and Actinomycin D.

v) Chemotherapeutic effect of Jawaharene on M.F.S₂ tumours and Ehrlich Ascites cells in C₃H mice was studied for 12 days period both by subcutaneous and intra-tumour injection. In the later case the inhibition was more pronounced. In case of Ehrlich ascites cells the packed cell volume was much decreased.

vi) Different labelled substrates were used to see the incorporation of labelled carbon into proteins and lipids of normal and tumour tissues. It was observed that the activity of tumour cells was ^{increased} 5 times for proteins and 1.6 times for lipids than the normal cells.

Both Jawaharene and Mitomycin C showed strong inhibitory effect on incorporation of C^{14} into proteins by tumour cells. Maximum inhibition of incorporation of labelled carbon was observed at levels of 200 μ g of Jawaharene and 20 μ g of Mitomycin C. So these are the optimum doses. The degree of inhibition was almost double in case of tumour cells than normal cells.