

Autoradiographic Study of Bladder Neoplasms

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1. Physical and chemical factors which affect DNA and RNA labeling in vitro with Tritiated Thymidine and Cytidine were evaluated using autoradiography of Yoshida Sarcoma and human bladder neoplasms.

Adequate labeling was achieved by Hanks' BSS and even by normal saline as culture media, during one hour's incubation at 37°C followed by exposure of the autoradiographs for 7 to 14 days.

KODAK NTB-3 liquid emulsion is best for dipping method, and specific activity should be as high as possible with high concentration.

2. The autoradiograms of 50 bladder neoplasms and 48 normal urothelium are reviewed and correlated with the histological studies.

a. There is a close correlation between

the DNA Labeling Index and the histological grade of neoplasms.

Several cases, however, showed extraordinarily high labeling index with low histological grade.

b. There is no difference between the RNA L.I. and the grade of the neoplasms or the normal urothelium.

c. Normal urothelium shows 1 to 2% of DNA labeling in most cases, but few (all of them having neoplasms in the different location within the bladder) were found to have quite high labeling indices.

These interesting cases are to be followed up and evaluated if there is any relation with the theory of so-called multicentric origin or high recurrence rate of bladder neoplasms.

Studies on Epidermal Cancer by ³H-Thymidine Autoradiography

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Using ³H-thymidine autoradiography, cyto-kinetics of epidermal cancer such as squamous cell carcinoma, basal cell epithelioma and Bowen's disease was analyzed by labeling index and distribution of the labeled cells. In addition, experimental carcinoma of skin of mice induced with methylcholanthrene was studied.

In tumors of the I grade of Broders' classification of squamous cell carcinomas, proliferation zone was limited to the marginal zone of cancer cell nests. In the III grade of tumor, proliferation zone was observed diffusely throughout the nests. In Bowen's disease and basal cell epithelioma, the labeled cells were also shown diffusely.

The labeling index of undifferentiated part of squamous cell carcinoma was 20-30 per cent. These indices were lower than those of inflamed reactions of epidermis, such as psoriasis vulgaris and chronic eczema. The labeling index of normal epidermis of mice was 6 per cent. In an experimental hyperplasia of mouse skin, the labeling index was 40-45 per cent but in squamous cell carcinomas of mice the labeling index was 20-25 per cent.

It was suggested that the growth of cancer cell nests does not depend necessarily upon the accelerated proliferation, but also upon the prolongation of life span of cancer cells.