

The enzyme histochemical study in experimental carcinoma after cryosurgery

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Many studies have been made on the biological effects in freezing tissues after cryosurgery.

Materials and Methods

Experimental tumors were made to topical application of DMBA in hamster cheek pouch 2 times a week. Cryosurgery were carried out 3 times a week. The materials were obtained from frozen tissues, and stained with HE, PAS and others. Dehydrogenase histochemistry and LDH isozyme were employed in the same tissues.

Results

Cryonecrosis; pyknosis and karyorrhexis in superficial tissue, dilatation of capillary vessels, irregular arrangement of neoplastic epithelium, development of mast cells were observed. Cryonecrotic areas were devoid of LDH stainability. The LDH isozyme showed decreasing LDH V activity following cryosurgery, irrespective of high LDH V in cancer stage. The results of tissue necrosis due to cryosurgery were dependent on the freezing temperature and freezing times. The effects were expounded by histochemical methods and LDH isozyme.

Histochemical Study of Alkaline Phosphatase in Adrenocortical Adenoma

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The activity and localization of alkaline phosphatase were studied by light and electron microscopes in adrenocortical adenomata of primary aldosteronism (P.A.) and Cushing's syndrome (C.S.).

The activity of the enzyme was stronger in adenoma of C.S. than that of aldosteronoma in P.A.. The electron microscopic study revealed lead deposits as reaction products along the cellular membrane both in C.S. and P.A. though lead deposits were seen more frequently and larger in size in C.S..

Alkaline phosphatase is considered to be related to transport and absorption of materials necessary for cellular activity. The amount of daily production of aldosterone from aldosteronoma is much less, compared to that of cortisol from C.S. adenoma. Morphologically adenoma of C.S. is presumed to originate from the inner zone of the cortex, while that of P.A. from the outer zone.

Therefore, the histoenzymatic difference of both adenomata would be attributed to different origins and functional activities.

Histochemical Studies on Mice Colon Tumor by DMH on High Fat Diet

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Epidemiological study and animal experiments suggested a high incidence of colon cancer by high fat intake. We studied the experimental colon tumors histo- and cytochemically (AlPase, AcPase, SDH, LDH, G6Pase and Lipase). BALB/C strain mice were fed by three different fat levels of diets and subcutaneously injected dimethylhydrazine (DMH), 15mg/kgBW. Particularly, the change of plasma membrane (PM) of tumor cells was observed by the reaction of Mg⁺-ATPase and lectin. The tumors were produced within 5cm from anus and showed the differentiated papillary adenocarcinoma and some invaded into muscularis mucosae and muscle layer. SDH and AcPase showed irregularly positive reaction in tumor cells and the other enzyme activities were weaker than intact areas. Adherence of tumor cells with adjacent cells decreased and also microvilli were more club-shaped or disappeared. However Mg⁺-ATPase activity and lectin reaction were seen along the cell membrane of tumor cells. There was no effect of fat level in diets on histological and histochemical findings of tumor cells.

Cytochemical Study in Cartilagenous Tumors (Alkaline phosphatase-polysaccharide)

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Ten cases of cartilagenous tumors and two cases of fetal femurs, as a control, were studied. In cases of control group, well differentiated chondrosarcoma, enchondroma and osteochondroma, the Al-Phase activity was found on the membranes of certain organelles and cytoplasmic membranes. Polysaccharides were stained in the cytoplasm by PAM, PA-PTA and Al-Bi methods. These findings suggested that there exist a function of matrix synthesis. On the other hand, undifferentiated chondrosarcoma showed considerably different findings. Al-Phase activity was found only on cytoplasmic membrane. In benign chondroblastoma cells, intense Al-Phase activity was not observed on the membrane but within cytoplasm. There were no secretory vacuoles nor transfer vesicles seen in the cells. These findings suggested that matrix synthesis in benign chondroblastoma cells might be interfered by rough ER. Both staining for Al-Phase activity and polysaccharide are thought to be useful for an indicator to matrix synthesis in chondrogenous tumors.