

ACQUISITION OF ANGIOGENIC CAPACITY AS A MARKER OF PROGRESSION TOWARDS NEOPLASTIC TRANSFORMATION. Pietro M.Gullino. National Cancer Institute, Laboratory of Pathophysiology, Bethesda, MD 20205, USA.

The capacity to induce new formation of capillaries is a property common to neoplastic cells and indispensable for the formation of a tumour *in vivo*. The objective of this work was to find out the time when the angiogenic capacity was acquired in the course of neoplastic transformation and to ascertain whether this event could be taken as an early marker of neoplastic transformation. Angiogenic activity was determined by the rabbit corneal test. The results of 3 experiments were obtained: 1) Epithelial outgrowths of human mammary gland with no morphological or clinical sign of neoplastic transformation already showed angiogenic capacity in 28% of the specimens. In mice and rats epithelial outgrowth with highest angiogenic capacity had the highest incidence of neoplastic transformation in the mammary fat pad. 2) During carcinogenesis by plastic sheets implanted subcutaneously in rodents, the cell population that originates the sarcoma acquired angiogenic capacity long before any sign of neoplastic transformation could be detected. The angiogenic capacity appeared most frequently in conditions where the probability of sarcoma induction was the highest. 3) In the course of neoplastic transformation *in vitro*, subcutaneous fibroblasts acquired angiogenic capacity at the 4th-5th passage while they became neoplastic only at the 20th passage.

THE EFFECT OF L-CYSTEINE AND ITS DERIVATIVES ON AEROBIC GLYCOLYSIS AND PYRUVATE KINASE ACTIVITY IN TUMOUR CELLS. M.Gumińska, T.Kędryna and E.Marchut. Institute of Medical Biochemistry, Copernicus Medical Academy, 31-034 Kraków, Poland.

The aim of this study was to determine whether cysteine (CSH) or some of its derivatives which show a defective metabolism in tumour specimens have an influence on aerobic glycolysis in the Ehrlich ascites tumour model and normal murine tissues (liver and skeletal muscle). It appeared that L-CSH stereospecifically decreases aerobic lactate formation and glucose uptake and diminishes ATP-content in tumour material only, but not in normal mouse tissues. Crossing-over in tumour cell pyruvate and 2-phosphoenolpyruvate concentrations pointed to tumour pyruvate kinase (PK) as an enzyme sensitive to L-CSH inhibition. PK belonging to the key glycolytic enzymes is involved in various feedback controls. Enzymatic studies indicate the presence in various tumour cells, in addition to normal CSH-insensitive PK, a tumour specific CSH-sensitive isoenzyme which has been not detected in normal tissue supernatants, and which might appear during the process of carcinogenesis.

A STUDY OF HISTOCHEMICAL CHANGES IN MUCUS FROM NORMAL AND TUMOUR BEARING MUCOSA IN PATIENTS WITH COLORECTAL CANCER. N.A.Habib and C.B.Wood
Department of Surgery, Royal Postgraduate Medical School, London, U.K.

In patients with colorectal polyps and cancer, an altered pattern of mucus production has been shown. Such patterns may be used to indicate patients at risk of developing tumour recurrence. Rectal biopsies were taken from 10 normal individuals. In 16 patients with colorectal cancer, biopsies were taken from tumour, adjacent mucosa and resection edges. Sections were stained with high iron diamine - alcian blue to distinguish sulphated from sialomucins. All normal biopsies showed a predominantly sulphated mucin pattern. Tumour biopsies from the 16 patients showed a marked sialomucin staining and in transitional mucosa adjacent to the tumour, 14 showed this increase. Five patients had increased sialomucins at the resection margins, all of whom had similar changes adjacent to the tumour, suggesting a wide field change in the mucus pattern.

A further 24 patients with colorectal cancer, who underwent apparently curative surgery in 1976, were studied. Twelve patients developed anastomotic tumour recurrence, of which 11 had strongly positive sialomucin stain at the resection margins. By contrast, 12 patients, similarly matched for age, sex and site of tumour, but with no recurrence, had a normal mucus pattern.

These changes may give an early prediction of patients at risk of developing primary or recurrent carcinoma.