COMPARISN OF SENSITIVITY OF BONE MARROW CELLS AND MYELOID LEUKAEMIA CELLS TO ULTRAVIOLET IRRADIATION

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Our previous results have shown that bone marrow cells are very sensitive to UV-irradiation. UV-doses as small as 5 J/m^2 abolished stem cell division, and cells transplanted in syngeneic or allogeneic lethally X-irradiated recipients produced small numbers of colonies, and the recipients died. Myeloid leukaemia cells were exposed to UV-doses of 5, 20, 80, 160, 320, 640 and 1,280 J/m^2, and transplanted into RF mice. All mice died with typical symptoms of leukaemia and in the usual time period. If Uv-irradiated leukaemia cells were transplanted into lethally X-irradiated mice, all mice died earlier than irradiated mice without UV-treated cells, but splenomegaly was not observed. Higher doses of UV irradiation were also examined, such as 2,000, 4,000, 8,000, 16,000, 32,000 and 64,000 J/m^2. Recipients of UV-irradiated leukaemia cells died with leukaemia, but 5 or 10 days later than the recipients of leukaemia cells not irradiated with UV. If the recipients were X-irradiated and transplanted with leukaemia cells irradiated with these high doses of UV, mice died significantly earlier than the control, only irradiated mice, but splenomegaly was not observed. However, if X-irradiated mice were injected with syngeneic bone marrow along with UV-irradiated leukaemia cells, they survived several days longer than mice irradiated only, and all mice developed splenomegaly. The results suggest that myeloid leukaemia cells are resistant to UV-irradiation, or that UV-irradiation results in reactivation of an oncogenic virus.

EPITHELIAL CELL PROLIFERATION OF COLORECTAL MUCOSA IN NORMAL SUBJECTS AND IN PATIENTS WITH POLYPS OR CANCER OF THE LARGE BOWEL

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In normal individuals the cytoproliferative activity of colorectal mucosa is limited to the lower portions of the crypts and almost absent in the surface. It has been suggested that in some groups of subjects at increased risk for colorectal cancer, the prolifrative zone is expanded to the whole length of the gland. Using an autoradiographic approach we evaluated: (1) the proliferative activity of different large bowel segments in normal controls; (2) the pattern of cell proliferation in patients with polyps or cancer of the large bowel. For the purpose of investigation intestinal crypts were divided in 5 equal compartments from the base (compartment 1) to the surfce (compartment 5). The labelling Index for the crypt compartment (L.I.-C.C.: ratio of labelled - i.e. proliferating - cells to total cells in each compartment) was similar in the various large bowel tracts. L.I.-C.C. was significantly ($P<0.001$) higher in polyps and in cancer patients than in controls. In conclusion, rectal samples are probably representative of the kinetic activity of the entire large bowel. In polyp or cancer patients an upwards expansion of the proliferative zone has been observed; this was more evident in compartment 5, which has a high discriminatory power between subjects with or without intestinal neoplasms.

FREQUENCY OF COLORECTAL CANCER AMONG FIRST-DEGREE RELATIVES OF PATIENTS WITH CANCER OR POLYPS OF THE LARGE BOWEL

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The recent institution of a Colorectal Tumour Registry in our Health Care District gave us the opportunity to test if the frequency of cancer (particularly of the intestine) is higher in first-degree relatives of patients with large bowel malignancies than in the general population. For all the registered patients a careful clinical history was taken and the genealogic tree was traced. Each patient was matched to a control of the same age and sex. During 1984-85 a total of 271 cases of cancer and 301 of polyps were registered; there were 4156 first degree relatives in the diseased group and 4224 in the control group. Among the relatives of cancer patients we found 118 cases of colorectal cancer as compared to 28 in controls (Relative Risk, RR, 4.5; $P<0.001$). The same trend was seen both in parents and, more markedly, in siblings (RR 2.5 and 9.0 respectively). A similar excess of colorectal cancer was observed in relatives of patients with polyps, whereas no difference was seen in the frequency of other tumours. In conclusion, we observed a fourfold increse of colorectal cancer in