Differences of High-molecular Components of Gastric Cancer from Those of Gastric Mucosa. First Report

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Gastric cancers and gastric mucosa were pooled separately according to blood group, and each of the batches was extracted with water and fractionated by saturation with ammonium sulfate, precipitation with increasing volumes of alcohol in the presence of sodium acetate and acetic acid and in that of barium acetate and other operations. Six group-active mucopolysaccharides (MPSs I) and two group inactive mucopolysaccharides (MPSs II) were isolated in electrophoretically homogeneous state. Chemical and serological investigations of the preparations disclosed the following facts: 1) MPSs I from stomach cancers of group A and group B persons are very weakly group A or B active as compared with those from the stomach mucosa of non-cancerous group A and group B persons, but any of the cancerous MPSs I is nearly as strong as the corresponding non-cancerous MPS I with respect to group 0 activity; 2) MPSs I from the cancerous and non-cancerous sources all contain glucosamine, galactosamine, galactose, L-fucose and sialic acid as sugar and sugar derivative components; 3) The six MPSs I showed...
no noticeable differences in N-, total hexosamine-, galactose- and L-fucose-content and iodine use among them; 4) The cancerous MPSs I differ scarcely in glucosamine/galactosamine ratio and optical rotation from one group to another, whereas the non-cancerous do markedly; 5) The cancerous MPSs I contains more sialic acid than the non-cancerous; 6) The electrophoretic mobilities of all the cancerous and non-cancerous MPSs I almost agree with one another; 7) The cancerous group A MPS I has proved to have the molecular weight of \(7.7 \times 10^4\) (as rod) or \(11.1 \times 10^4\) (as disk) and the non-cancerous that of \(9.1 \times 10^4\) (as rod) or \(13.1 \times 10^4\) (as disk), as calculated from intrinsic viscosities and sedimentation constants; 8) The cancerous and non-cancerous MPSs II contain glucose and mannose beside the sugars in MPSs I; 9) The analytical values of the cancerous MPS II regarding total hexosamine, galactose, mannose and iodine use and specific rotation do not diverge from the corresponding values of the non-cancerous MPS II, although the two MPSs slightly differ in glucosamine/galactosamine ratio from each other; 10) Glucose and sialic acid contents are higher and L-fucose content is lower in the cancerous MPS II than in the non-cancerous.

**Studies on the Serum Protein-Bound Polysaccharides in Patients with Cancer; Especially on the Possible Site of Their Production**

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Blood serum protein bound complex polysaccharides (below referred to as 'complex carbohydrates') in a patient suffering from cancer were analyzed. The results are compared with the normal control group. It was found that the complex carbohydrates show a marked change in the cancerous group compared to the normal control group. The complex carbohydrates were isolated from the serum of the cancerous group and the normal control group. The isolated complex carbohydrates were subjected to various chemical and physical analyses. The analyses showed that the complex carbohydrates in the cancerous group are different from those in the normal control group. The differences are reflected in the molecular weight, carbohydrate composition, and optical rotation. The results suggest that the complex carbohydrates in the cancerous group may play a role in the development of cancer.

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