the optical properties of the 'Perspex' bombarded with electrons is mainly due to an electrical effect, the remaining part being due probably to mechanical strain caused by the non-homogeneous increase of the temperature. It seems evident that something like the Kerr electro-optic effect is occurring. The charges in the 'Perspex' are more or less situated in planes perpendicular to the original direction of the beam, causing an electric field in that direction and giving the 'Perspex' the property of behaving as a uniaxial crystal with its axis along the electric field.

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BIOCHEMISTRY

Hexosamine and Sialic Acid Contents in Cells

Few data are available on the determination of glycoproteins containing sialic acid in tumour tissues, although the presence of an acid mucopolysaccharide in some kinds of tumour tissue has been reported. We determined the hexosamine and sialic acid contents in tumour cells, the HeLa cells and *C3H* ascitic hepatoma cells of different types, comparing them with those of non-malignant cells. The liver cells of *C3H* mice, and *FL* cells obtained by a tissue culture were used as non-malignant cells. The liver cell is generally considered to be a good example of the basic cell type. The types of the *C3H* ascitic hepatoma used were *MH* 134, *MH* 129 *P* and *MH* 129 F^1, which were inoculated into (*C3H*/*HeN*dd) F_1 hybrid mice, subcutaneously or intraperitoneally. The cells from solid tissue were prepared by use of a tissue presser. The cells were dried with acetone after washing with saline solution. The results of the determination are summarized in Table 1.

The sample used for the sialic acid determination was examined, and the absorption spectrum of the coloured solution which was produced by the resorcinol reagent was read; two peaks of absorption, with maxima at 450 and 580 mμ were obtained. This coincides with the results for sialic acid reported by Svennerholm[4]. From these results no significant difference in hexosamine and sialic acid contents was found between tumour cells and non-malignant cells. Prodi[5] reported the hexosamine contents of liver in rat, rabbit and guinea pig presenting values of 436, 408 and 405 γ/100 mgm. of dry weight. These results are only a little higher than the values obtained in *C3H* mouse liver. Hexosamine and sialic acid contents of the intact liver cells of the mice with intraperitoneally inoculated tumours were almost equal to the normal values, although the serum-level of sialic acid in mice with the same tumour was remarkably high[6]. Thus it was found that glycoprotein containing sialic acid is not stored in tumour cells as well as in the liver cells of tumour-bearing animals, even if the liver were a site of synthesis of these glycoproteins[7]. Furthermore, it may be concluded that tissue destruction is not a direct origin of the increase of serum glycoproteins in tumour-bearing subjects. The presence of a certain kind of substance which stimulates the production of sialic acid-containing substances in tumour-bearing animals is assumed. This assumption is partly based on the finding of the excretion of so-called 'x-mucopolypeptide', which was stated to be a tumour-specific urinary mucopolypeptide[8].

Table 1. Sialic Acid and Hexosamine Contents of Cells

	Nitrogen	Hexosamine		Sialic acid	
	mgm./100 mgm. dry weight	mgm./100 mgm. dry weight	μgm./mgm. nitrogen	mgm./100 mgm. dry weight	μgm./mgm. nitrogen
FL cell	10·8	0·41	38	0·36	33
HeLa cell	12·0	0·37	31	0·46	38
Tumour cell					
MH 134 (i.p.)	12·9	0·48	37	0·26	20
MH 134 (s.c.)	14·4	0·42	29	0·36	25
MH 129*F* (i.p.)	14·1	0·40	28	0·36	26
MH 129*P* (i.p.)	14·2	0·36	25	0·32	23
Liver cell of *C3H* mice					
Normal	11·8	0·32	27	0·31	26
MH 129*F* bearing	12·6	0·33	26	0·33	26
MH 129*P* bearing	13·0	0·39	30	0·33	25

i.p., Intraperitoneally inoculated tumour; s.c., subcutaneously inoculated tumour.
Hexosamine was determined according to Boas (ref. 2), and sialic acid according to Svennerholm (ref. 3) using the orcinol reagent.

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Polarographic Examination of Sialic Acids

We have investigated systematically the polarographic wave of neuraminic acid derivatives with a dropping-mercury electrode ($m = 2 \cdot 86$ mgm./sec., $t = 2 \cdot 98$ sec.). The existence of a sialic acid wave was anticipated from the fact that structurally related substances such as pyruvic acid[1,2] and fructose[3,4] give well-defined polarographic waves. Three type of waves could be observed in N-acetylneuraminic acid solution (NANA): (*a*) a hydrogen wave in 0·1 *M* LiCl or in 0·01–0·1 *M* tetramethylammonium bromide (TMABr) under *p*H 7. The apparent half-wave potential is − 1·65 V. (s.c.e.) in 0·1 *M* TMABr and − 1·48 V. in 0·01 *M* TMABr. There is a linear relationship between the height of the wave and the square root of the height of the mercury column up to 45 cm.; and, under defined conditions,