In certain plant tissues, where interference has occurred, high concentrations of methyl-pentoses are probably responsible in some cases, and high concentrations of sucrose and/or fructose in some other cases. In animal tissues interference of this type has so far been encountered in normal serum, in lactating mammary gland, and in certain disease conditions, for example, some types of rheumatoid arthritis, among other cases.

I suggest that the nonulosaminic (sialic) acids are a common cause of interference. Not only are these acids often associated with methyl-pentoses (6-deoxy-hexoses) (for example, fucose), which may give an interforing colour by conversion to methyl-furfuraldehyde, but in addition they themselves give a blue-violet coloration when treated with the Dische reagent. In the past few years these acids have been found to occur in a large number of tissues (Table 2) including those found to give trouble in this test.

OCCURRENCE OF NONULOSAMINIC (SIALIC) ACIDS, AND THE CARBOHYDRATES FOUND IN ASSOCIATION (REF. 18) Table 2. Origin Associated sugars Ref.

Mucin of bovine submaxillary gland

N-Acetyl-glucosamine, glucose, glucosamine, fucose, mannose 14 Mannose, fucose, galactose, galactosamine, glucosamine

Brain (especially gangliosides), serum*, cerebrospinal fluid, erythrocytes, saliva, vitreous humour, urine, bronchial and epithelial tissue, liver*, mammary gland (lactating)* Milk (human)*, colostrum (bovine)*

Lactose, galactose, glucose, fucose, N-acetyl-galactosamine 17 16

E. coli Abnormal Dische tests so far found with the tissues marked with an asterisk (cf. ref. 19).

The main purpose of this communication is to point out the need for careful checking of the absorption spectrum when using the test, particularly on materials not previously characterized, or where alternative assays are not carried out. A subsidiary purpose is to suggest that where interference of this type is encountered, this may be partially diagnostic of unusual concentrations in the tissue of some of the substances listed, and it may be useful in some cases to carry out further tests for these compounds.

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Variants of α_1 -Acid Glycoprotein

IN a recent publication¹, α_1 -acid glycoprotein, a human plasma glycoprotein, was shown to be polymorphic. At pH 2.9, that is, near its isoelectric point, seven zones were observed if the mentioned protein had been isolated from pooled normal blood. Moreover, it could be demonstrated that, following enzymatic removal of essentially all sialic acid, the modified pooled α_1 -acid glycoprotein resolved at pH 4.8 into two major and a minor faster moving component².

In the present investigation experiments were carried out to study further the latter observation. α_1 -Acid glycoprotein was prepared from serum of normal adults and analysed by starch-gel electrophoresis at pH 4.8. Three types of patterns were observed (Fig. 1): Type 1 distinguished itself in that the slower moving main band exhibited the maximum colour intensity, whereas Type 2 showed the maximum colour at the faster moving main band. Type 3 revealed the mentioned two bands to be almost equally coloured. To evaluate the three types of patterns with regard to the homozygous and heterozygous properties, further analyses are needed.



Fig. 1. Starch-gel electrophoretic patterns of type 1 (1), type 2 (2) and type 3 (3) of a_1 -acid glycoprotein modified with neuraminidase. The electrophoresis was carried out at pH 4.8 in $\Gamma/2$ 0.02 acetate buffer. The protein was applied at the positions indicated by \bigcirc and migrated towards the anode (+)

An additional series of experiments was performed to establish the relationship between the patterns obtained at pH 2.9 using native α_1 -acid glycoprotein and those observed at pH 4.8 utilizing native α_1 -acid glycoprotein from which sialic acid had been removed enzymatically. α_1 -Acid glycoprotein preparations from apparently healthy adults were analysed by starch-gel electrophoresis at the mentioned two pH values. As judged from the relatively small number of experiments it appeared that Types 1, 2 and 3 were largely associated with pH 2.9 patterns showing 7, 6 and 7 bands, respectively.

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