Structural Study of the Group Carbohydrate from Pig Stomach Mucus

9th Report*

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(Received for publication, September 1, 1953)

1) From a batch of pig stomach mucus was obtained a group carbohydrate (amino acid-polysaccharide complex) specimen, containing 14% L-fucose—Ch. I—in a manner already reported by Yosizawa.¹⁾ By fractionation with alcohol was separated from it an alcohol-soluble part containing 10% fucose, which showed Group A activity at 6.4×10^5 -fold dilution and Group O activity (measured with an eel serum) at 3.2×10^4 -fold dilution—Ch. II. Further, this was heated with 1 N acetic acid at 100°C for 1 hour and for 3 hours, and Ch. III and Ch. IV were recovered respectively. Ch. III contained about 5% fucose but Ch. IV only a trace of this sugar. The Group A activity of Ch. II decreased to 1/16 by both the 1 hour and 3 hours heating with acetic acid of the substance, but the Group O activity to 1/8 and 1/32 respectively. Judging from the analyses (of the sugar components and iodine use), positiveness of the indirect Osaki-Turumi reaction and the periodate consumptions of Chs. I~IV, fucose in Ch. II partakes most probably in forming the non-reducing terminal disaccharide unit and the adjacent of the polysaccharide chain, replacing galactose of the other disaccharide units made up of acetylglucosamine and galactose. Moreover, the experiments with hot acetic acid suggested that fucose is not absolutely necessary for the Group A specificity.

2) Pig gastric mucus was divided into four fractions inclusive of the gastric mucin. All of the fractions were strongly Group A active and much less Group O active. They contained same kinds of sugar (glucosamine, chondrosamine, galactose, mannose and L-fucose) in the equivalent ratios within respective fractions, which resembled mutually between the fractions, so that the same group carbohydrate looked obtainable from any of the fractions. Next, group carbohydrate specimens containing chondrosamine, glucosamine, galactose and fucose were given by tryptic digestion as well as by scission with 1 N NaOH at 0°C of the mucin, but specimens similar to Ch. I in 1), which lacked chondrosamine and mannose, by applying 1 N NaOH to the mucin and another mucus fraction at about 20°C.

References

- 1) Yosizawa, Tohoku J. Exp. Med., 1949, **51**, 51.

* Details were read before the 25th General Meeting of the Japanese Biochemical Society, Tokyo, April 26-28, 1953.