

ISOLATION AND CHARACTERISATION OF NEUTRAL OLIGOSACCHARIDES FROM HUMAN BRONCHIAL GLYCOPROTEINS

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INTRODUCTION

Human acidic bronchial glycoproteins isolated from patients suffering from cystic fibrosis had been shown to be very heterogeneous with regard to acidity and molecular size of their carbohydrate chains. Neutral oligosaccharides from these glycoproteins have been isolated and purified ; their chemical structure have been determined.

RESULTS

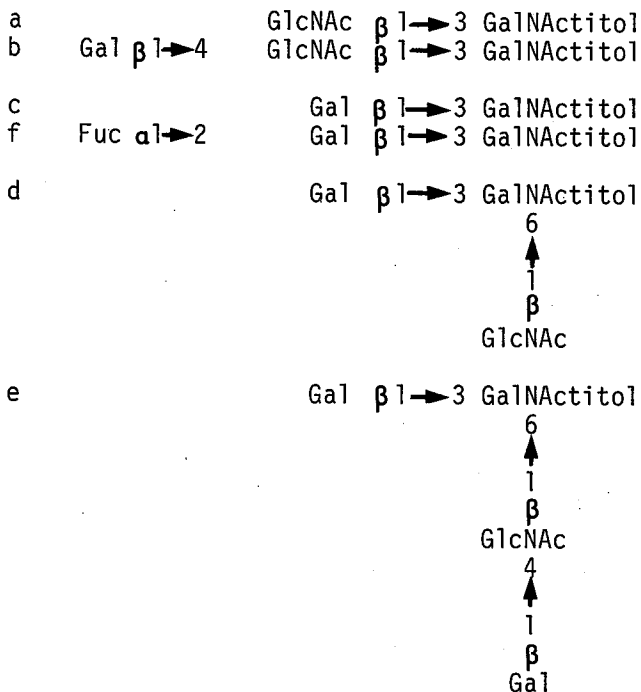
Alkaline borohydride treatment of bronchial acidic glycoproteins leads to an heterogeneous population of reduced oligosaccharides and glycopeptides. The mixture, fractionated on ion exchange resin, gave a neutral oligosaccharide fraction (Ic) and three acidic oligosaccharide fractions.(1,2)

The neutral chains of fraction Ic were subsequently fractionated by DAX4 anion-exchange chromatography into eight oligosaccharides which were tested for purity by paper chromatography. Six oligosaccharides were pure and sugar analysis showed the components to be in the proper molecular proportions (Table I).

Table I : Molecular composition of 6 major oligosaccharides eluted from paper chromatography.

Oligosaccharides	GalNAcitol	GlcNAc	Gal	Fuc
a	1	0.8		
b	1	0.8	1.2	
c	1		1.2	
d	1	1	1	
e	1	1	2	
f	1		1.2	1.2

Periodic oxydation, methylation analysis, gas liquid chromatography-mass spectrometry and 360-MHz ¹H-NMR of the 6 oligosaccharides lead to propose the following structures :



In order to improve the purification of the oligosaccharides a convenient HPLC method has been worked out : it allows a rapid purification of the six oligosaccharides directly from fraction Ic.

CONCLUSION

HPLC represents an interesting improvement among the methods used to purify neutral oligosaccharides.

In the case of human bronchial mucus glycoproteins, at least three different cores exist in the carbohydrate chains.

This HPLC procedure also enables a screening of neutral oligosaccharides from bronchial mucus glycoproteins secreted in different bronchial diseases.

REFERENCES

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