Interconversion of Blood Group Lipoids A and B in vitro and N-Glycoside Linkage in Group Substances A and B in General*

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It was found that the Group B lipoid of hog lung1) changes in part into a Group A substance (determined by iso-agglutination inhibition test) on standing in physiological saline. The optimum pH was 7.0, just as for the α, β-rearrangement of N-glycosides. The change, which was hardly noticed at 0°C, occurred more and more markedly with raising the temperature of the solution, and when the latter was again cooled to 0°C, the A activity diminished gradually. That the appearance of A activity is not due to formation of a non-specific anti-agglutinative agent was confirmed by an absorption experiment by the use of anti-A and anti-B agglutinin. Interconversion of Group lipoids A and B of human liver could be caused by procedures different from above.

We subjected those group lipoids to partial alkaline cleavage so as to separate a group-potent portion rich in carbohydrate. A spot on a filter-paper of the scission products, placed after dissolving in a buffer of pH 5.0 and maintaining at 50°C for 5 hrs. (in moistened room), gave a more vivid ninhydrin reaction than the control spot without the prior warming of the solution. They also gave positive result in retention analysis with azocarmine, when heated in advance to 40° with a dilute acetic acid of pH 2.0. On the other hand, they did not reduce a hot mercuric chloride solution at pH’s from 7.5 to 8.0, but were Fehling-positive. In these regards, the group carbohydrate (amino acid-polysaccharide complex) from hog stomach mucus2) proved to resemble them.

Those consequences of chemical tests indicate that the carbohydrate in the group substances combines with the polypeptide residue at its reducing terminal through N-glycoside linkage. We3) have already informed that a Group A carbohydrate from an animal tissue or fluid has positive rotation (optical) or less negative rotation than the corresponding Group B carbohydrate from the same source in spite of its identical analytical composition (such group carbohydrates as those from long-stagnating cyst fluids excluded), if the factors are isolated in one and the same manner. Thus it may be most plausibly assumed that Group A and B substances are α- and β-N-glycosides respectively.

References


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