

EVIDENCE FROM LECTIN REACTIONS FOR MANDATORY PAIRING OF THE TERMINAL SUGARS IN HUMAN BLOOD GROUP AB

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The biochemical structure is well known for the ABO human blood group system, although it is subject to changes in small details. This structure is a bifurcate oligosaccharide of four sugar components attached to an amino acid background in the cell membrane. If the terminal sugar is D-galactose, the cell type is B; if it is N-acetylgalactosamine, the cell type is A; if neither sugar is attached, the cell type is O.

Lectin (phytohemagglutinin) from Bandeiraea simplicifolia reacts specifically with human B and AB type cells; and, therefore, is said to have the chemospecificity α -D-galactose. The erythrocytes of all dogs also react with this lectin. However, the red cells of particular dogs can absorb the reagent to yield a reagent specific for B and A_2B cells, while A_1B cells are non-reactive.

If the attachment of the terminal sugars in type AB is random, the absorbed lectin Bs should react with A_1B . Even if the A sugar interferes (steric hindrance) with the lectin, still 1/4 of the molecules, $\begin{matrix} B \\ B \end{matrix} \text{---}$, should allow agglutination. We conclude, therefore, that the attachment of the A & B sugars likely is mandatory as pairs and that the position of the A sugar, N-acetylgalactosamine interferes with the specific reaction of the absorbed Bs lectin with D-galactose.