Bristol Institute for Transfusion Sciences
Incorporating the
International Blood Group Reference Laboratory

NHS Blood and Transplant

IBGRL RESEARCH PRODUCTS

DATA SHEET

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Antigen	Blood Group A
Clone	BIRMA 1
Product Code	9491
Immunoglobulin Class	Mouse IgM Kappa light chain

Antigen Description and Distribution

The histo-blood group A antigen is defined by the carbohydrate structure at the non-reducing termini of oligosaccharide chains of glycoproteins and glycolipids. Carbohydrate chains are synthesized by the action of α-N-acetyl-D-galactosaminyl-transferase, which catalyzes the transfer of GalNAc monosaccharide to an acceptor substrate called the H antigen. The structure of the A antigen is GalNAc(α1-3)Gal(β1-3)GlcNAc-R

Fuc (α1-2)

ABO, of which the A antigen is part of, is the most important blood group system from the clinical blood transfusion perspective. Approximate frequencies of ABO phenotypes in southern England are as follows: O 43%, A 45%, B 8% and AB 4%; but frequencies vary throughout the world. The A antigen is widely distributed on erythrocytes, cells and tissues, and is present, in soluble form, in body fluids of A positive individuals. About 20% of group A people secrete no A substance because their secretions contain no H antigen although they are still blood group A because the H antigen is still present on their erythrocytes. In a rare phenotype, the Bombay phenotype, no H is present in secretions or on the erythrocytes and consequently no A or B are present. The A antigen is divided into 2 main subgroups, A_1 and A_2.

Clone

BIRMA 1[1] was made in response to immunisation with salivary glycoprotein from a human blood group A secretor. BIRMA 1 directly agglutinates blood group A erythrocytes. BIRMA-1 accurately grouped all 1,384 adult and 103 cord blood samples initially manually tested. On automated grouping on the Olympus PK7100 no discrepancies were noted with over 64,000 samples tested. The antibody reacts strongly with all the common A subgroups: A_1 titre 1:1024, A_2 titre 1:512, A_1B titre 1;256 and A_2B 1:256. Tests using BIRMA-1 with cells bearing rare subgroups of A showed agglutination of A_3, A_3B, A_wB, A Bantu and Oriental: A_2, A_{int}, $A_{int}B$, A_2B and A_3B. 11 of the 18 A_x were agglutinated and there was no reactivity with the 2 B(A) cell samples tested. BIRMA-1 gave no positive reaction with any of the 450 papainized B cells tested. BIRMA-1 gives rapid avidity times: the appearance of agglutination at 3 seconds with A_1, A_2, A_1B and A_2B and attainment of a 3 + reaction in 16 seconds. The addition of 2% sodium chloride reduced the latter time to 5 seconds.

Further References/Reading

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