IBGRL RESEARCH PRODUCTS

NHS Blood and Transplant

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Antigen	CD233 / (Band 3) extracellular domain
Clone	BRIC 71
Product Code	9472
Immunoglobulin Class	Mouse IgG1, kappa light chain

Antigen Description and Distribution

CD233 (also known as erythrocyte band 3, EPB3, anion exchange protein 1, AE1, solute carrier family 4, SLC4A1) is an integral membrane protein in human erythrocytes, present at approximately 10^6 copies per human erythrocyte. It comprises two domains that are structurally and functionally distinct. The cytoplasmic N-terminal 40kDa domain has binding sites for erythrocyte cytoskeletal proteins, namely ankyrin and protein 4.2, which help to maintain the mechanical properties and integrity of the erythrocyte. This domain also binds a number of other erythrocyte peripheral proteins. The 55kDa glycosylated C-terminal membrane-associated domain contains 12-14 membrane spanning segments which function as a chloride/bicarbonate anion exchanger involved in carbon dioxide transport. The cytoplasmic tail at the extreme C-terminus of the membrane domain binds carbonic anhydrase II. CD233 associates with the erythrocyte membrane protein glycophorin A (GPA) which promotes the correct folding and translocation during biosynthesis of CD233. Many CD233 mutations are known in man and these mutations can lead to two types of disease; destabilization of the erythrocyte membrane leading to hereditary spherocytosis, and defective kidney acid secretion leading to distal renal tubular acidosis. Other CD233 mutations that do not give rise to disease result in novel blood group antigens, which form the Diego blood group system. The CD233 gene is located on chromosome 17q21-q22[1].

Clone

BRIC 71 was made in response to intact human erythrocytes[2]. BRIC 71 binds to an exofacial epitope on CD233 and agglutinates normal erythrocytes indirectly. BRIC 71 fails to agglutinate pronase-treated normal erythrocytes but agglutinates cells that have been treated with trypsin, sialidase, or 6% aminoethylisothiouronium bromide. BRIC 71 does not give reduced titres with chymotrypsin treated cells and fails to react with RBCs treated sequentially with chymotrypsin and LISS trypsin. Chymotrypsin treatment of intact erythrocytes cleaves the membrane domain of CD233 after Try-553[3] and try-558[4]. BRIC 71 does not react with electrophoretically separated components of human erythrocyte membranes by immunoblotting. BRIC 71 binds to the third extracellular loop of CD233 but binds to a slightly different epitope from BRICs 6, 90, 200 and BRACs 14, 18, 21 and 25[2].

References

1. Bruce L.J. and Tanner M.J.A. (Review) PROW 2:9-17 (2001).
2. Smythe J.S., Spring F.A., Gardner B., Parsons S.F., Judson P.A. and Anstee D.J. Blood 85:2929-2936 (1995).