



NHS Blood & Transplant 500 North Bristol Park Northway CD233 / Band 3 (N-terminal cytoplasmic domain) Antigen Filton Bristol BS34 7QH Clone **BRIC 170** Tel: +44 (0)117 921 7200 Fax: +44 (0)117 912 5796 **Product Code** 9450 Web: http://ibgrl.blood.co.uk

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 10⁶ 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-q22¹.

Clone

BRIC 170 was made in response to endo F-treated 55 kD tryptic bound domain of band 3. BRIC 170 binds within the amino acids 368-382 located near the N-terminal cytoplasmic tail of CD233 and does not agglutinate normal erythrocytes^{2,3}. BRIC 170 has been used to study the coexpression of band 3 mutants and Rh polypeptides⁴. BRIC 170 has also been used to study the band 3 macrocomplex in the erythrocyte membrane⁵.

References and further reading

- 1. Bruce L.J. and Tanner M.J.A. (Review) (2001) PROW 2, 9-17.
- 2. Toye A.M. et al (2004) J. Cell Science 117, 1399-1410.
- 3. Bruce L. (2006) Blood cells, Molecules and disease 36, 331-336.
- 4. Beckmann R. et al (2001) Blood 97, 2496-2505.
- 5. Bruce L. J. et al (2003) Blood 101, 4180-4188.
- 6. Beckmann R. et al (1998) Blood 92, 4428-4438.
- 7. Wainwright S.D. et al (1989) Biochem. J. 258, 211-220.
- 8. Wainwright S.D., Mawby W.J. and Tanner M.J.A. (1990) Biochem. J. 272, 265-268.



