IBGRL RESEARCH PRODUCTS

NHS Blood and Transplant

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Antigen	CD55 (DAF)
Clone	BRIC 128
Product Code	9403
Immunoglobulin Class	Mouse IgM, kappa light chain

Antigen Description and Distribution

CD55 is the complement regulatory protein decay accelerating factor (DAF)[1]. It is a 70kDa (in erythrocytes) glycoprotein anchored in the membrane by a glycosylphosphatidylinositol tail. In other cells the apparent molecular weight is somewhat larger. It has a substantial content of O- glycans, and also one N- glycan. The amino acid sequence (derived from the cDNA) is known. DAF binds to activated C4b or C3b complement fragments on the cell surface, preventing the assembly and accelerating the decay of both classical and alternative pathways. DAF carries the Cromer related blood group antigens[2]. CD55 was first described on erythrocytes, but is also found on other circulating blood cells[3,4]. DAF also has a wide distribution on cells in non-haemopoietic tissues, particularly epithelium and endothelium[5]. CD55 is found specifically at the foetal-maternal interface in placenta[6]. Soluble forms of DAF are found, for example, in plasma, saliva, urine etc. There are approximately 10,000 CD55 molecules per erythrocyte. CD55 has reduced expression on cells from individuals with paroxysmal nocturnal haemoglobinuria. Individuals with the rare Inab phenotype have an inherited deficiency of CD55[2]. CD55 is also Echo virus[7] and Coxackie virus receptor and is a ligand for CD97.

Clone

BRIC 128 was made in response to human erythrocytes and is a direct agglutinin. It has a functional binding affinity to erythrocytes of 1.8 x $10^7 M^{-1}$. BRIC 128 reacts by immunoblotting with a component of 70kDa in non-reduced erythrocyte membranes. The erythrocyte antigen is pronase, AET and chymotrypsin sensitive but trypsin and sialidase resistant. BRIC 128 was used to study the defect which causes absence of DAF from the peripheral blood cells of an individual with the Inab phenotype[8]. BRIC 128 recognises an epitope on the first short consensus repeat (SCR1) of CD55[9]. These results were confirmed in the fifth leucocyte workshop[10]. BRIC 128 stains both frozen and fixed tissue sections. BRIC 128 has been used by immunoblotting of red cell membrane proteins to reveal the membrane alterations in the adsence of RHCE[11].

References

1. Lublin D.M. and Atkinson J.P., (1989) Ann. Rev. Immunol. **7**, 35-58 (Review).
2. Daniels G.L. (1989) Vox Sang. **56**, 205-211 (Review).
3. Hadam M.R. (1989) in Leucocyte Typing IV; White Cell Differentiation Antigens Ed. W. Knapp *et al* Oxford University Press pp 694-697.
4. Spring FA *et al* (1987) Immunology **62** 307-313.
5. Anstee DJ and Spring FA (1989) Transfusion Medicine Reviews **3** 13-23.
6. Holmes *et al*., (1990) J. Immunol. **144** 3099-3105.
7. Bergelson JM *et al* (1994) Proc. Natl. Acad. Sci. **91** 6245-6248.
8. Tate CG *et al*. Biochem. J. 1989, **261**: 489-493.
9. Coyne KE *et al*. J. Immunol. 1992, **149**: 2906-2913.
10. Klickstein LB and Springer TA (1993) Proceedings of the fifth workshop and conference on white cell differentiation antigens, Boston , vol. 2 p1473-1474.
11. Joanna F. Flatt *et al*, (2012) Study of the D-- phenotype reveals erythrocyte membrane alterations in the absence of RHCE. BJH **158**, 262-273.