

# IBGRL Research Products

**We have a range of monoclonal antibodies for sale, available as culture supernatant, purified antibody and FITC, phycoerythrin and biotin conjugated antibodies.**

**We can also:**

- Custom produce antibodies to your particular specification and provide other conjugates such as APC or peroxidase.
- Prepare Fab and F(ab)<sub>2</sub> fragments.

**Of particular interest to haematology labs using flow cytometry are:**

- **CE marked Fetomaternal Haemorrhage (FMH) antibodies:** The CE marked reagents are used for analysis of FMH by flow cytometry.
  - FITC conjugated BRAD 3 (anti-D) quantitates the numbers of D positive cells in a mixture of D positive and negative cells, allowing estimation of the size of feto-maternal bleeds.
  - FITC BRAD 3 is used together with an isotype matched FITC labelled negative control antibody named AEVZ 5.3.
  - PE conjugated BIRMA 17C (anti-CD66b (granulocyte specific)) is used in conjunction with FITC BRAD 3 as a two colour reagent. BIRMA 17C enables the removal of neutrophils (by gating) that can occasionally interfere in the testing of FMH samples.
- **FITC IgG anti-A and anti-B** which are useful for investigation of chimeras, post transplant samples etc.
- **FITC IgG anti-CD59** which is useful for investigation of paroxysmal nocturnal haemoglobinuria (PNH).
- **Other specificities** include anti-A, B and RhD, RhE, H, M, N, CD34, CD44, CD45RA, CD47, CD55 (DAF), CD58 (LFA-3), CD59, Glycophorins A and C (cytoplasmic and extracellular), Band 3 (cytoplasmic and extracellular), W<sup>r<sup>b</sup></sup>, Tn, Kell, Kp<sup>bc</sup>, Lu and Lu<sup>b</sup>, Le<sup>a</sup>, platelet antibodies CD41/61, CD49b/29, granulocyte antibody BIRMA 17C (CD66b), HLA antibodies, complement C3d and NK cells.

# IBGRL Research Products

Monoclonal antibodies (Abs) that can be used for immunohaematological research.

## Product categories

### Human Clusters of Differentiation (CD) molecules

We have a range of Abs with antigen (Ag) specificities related to erythrocytes, granulocytes, platelets and others.

CD	Synonym	Function
CD34	Haematopoietic progenitor cell, MY10	Stem cell marker, found on haematopoietic precursors (found in high concentrations in umbilical cord blood), capillary endothelium, and embryonic fibroblasts. CD34 is a stage-specific, rather than a lineage-specific, leukocyte differentiation Ag.
CD41	GPIIb platelet component of integrin GPIIb-IIIa	Integrin subunit $\alpha$ IIb: Component of the integrin $\alpha$ IIb $\beta$ 3 (GPIIb-IIIa) fibrinogen receptor; major role is in platelet aggregation. Mutations can be causative for Glanzmann thrombasthenia.
CD41/ CD61	Platelet GpIIb/ IIIa	Integrin $\alpha$ IIb (CD41) interacts with the Integrin subunit (CD61) to form the platelet GP complex fibrinogen receptor, GpIIb/IIIa (CD41/61). It is expressed on platelets and megakaryocytes and is important for clot retraction, platelet adhesion and aggregation.
CD42b	Platelet GPIb	CD42b Ag is part of a complex consisting of four transmembrane components GpIb $\alpha$ /GpIb $\beta$ /IX/V, which is collectively designated as CD42. This complex is involved in the initial stages of platelet adhesion at high shear stress to damaged vessel wall via von Willibrand factor on the sub endothelial matrix. Platelet GPIb/V/IX complex is a late, specific marker of megakaryocyte differentiation. The GPIb/V/IX complex is essential for normal haemostasis; deficiency results in Bernard-Soulier Syndrome, a syndrome of thrombocytopenia and giant platelets.
CD44	H-CAM, Pgp-1, Hermes	Family of matrix adhesion molecules formed by alternative mRNA splicing, that adhere to hyaluronate, collagen, laminin and fibronectin. Helps maintain polarization of epithelial cells and has a strong association with the cytoskeleton. Found on bone marrow stromal cells and many other cells.

CD	Synonym	Function
CD45RA	T200, gp220	CD45 family consists of multiple members that are all products of a single complex gene. CD45RA is located on naive T cells.
CD47	IAP	This membrane GP functions as an adhesion and thrombospondin receptor. CD47 has a very broad tissue distribution and is present on haemopoetic cells, epithelial cells, fibroblasts, brain, tumour cell lines, mesenchymal cells.
CD49b/29	VLA-2, Platelet GPIIb/IIIa	The CD49b (GpIa) protein is the alpha subunit of the integrin GpIa/IIa heterodimer (CD49b/CD29). Integrins are found on a wide variety of cell types including, T cells, NK cells, fibroblasts and platelets. Integrins are involved in cell adhesion and also participate in cell-surface mediated signaling.
CD50	ICAM-3	Intercellular adhesion molecule 3 is a transmembrane GP that binds to the leukocyte adhesion LFA-1 protein. This protein is constitutively and abundantly expressed by all leucocytes and may be the most important ligand for LFA-1 in the initiation of the immune response. It functions as an adhesion molecule and a potent signalling molecule.
CD55	DAF	Complement Decay-Accelerating Factor membrane GP acts as a regulatory factor in one of the three pathways of the immune system complement cascade. CD55, first described on erythrocytes, is also found on other circulating blood cells. DAF also has a wide distribution on cells in non-haemopoietic tissues, particularly epithelium and endothelium.
CD58	LFA-3	It is a cell adhesion molecule which plays a critical role in facilitation of Ag specific recognition through interaction with CD2 on T lymphocytes and natural killer cells. It has a wide tissue distribution, being present on erythrocytes, platelets, monocytes, a subset of lymphocytes, bone marrow cells, fibroblasts, epithelium and endothelium cells.
CD59	HRF <sub>20'</sub> , MIRL, P18, H19, Membrane Attack Complex- inhibitor	CD59 is a cell surface GP complement regulatory protein. It inhibits the terminal stage of the formation of membrane attack complexes by homologous complement activation. CD59 is broadly distributed among haemopoietic and non-haemopoietic cells such as B cells, T cells, monocytes, epithelium, platelets, polymorphonuclear neutrophils and endothelium.

CD	Synonym	Function
CD55, CD59 and CD58		Abs to these identify three well characterised glycosylphosphatidylinositol (GPI) linked proteins which are deficient from the peripheral blood cells of patients with PNH. Used for the analysis of PNH cells by flow cytometry.
CD66b	CD67	Expressed on granulocytes. May play a role in the interaction between granulocytes or between granulocytes and epithelial cells.
CD173	H	H Ags are carried on the non-reducing termini of the carbohydrates of GPs and glycolipids. H is the precursor of the A and B histo-blood group Ags, which are formed by the addition of GalNAc( $\alpha$ 1-3) or Gal( $\alpha$ 1-3) respectively, to the galactose of H. In man, H active substances are found on erythrocytes, cells and tissues, and in the body fluids, linked to lipids (glycosphingolipids) or to proteins (GPs). In some animals, H Ags occur in the cells and tissues, but not generally on erythrocytes.
	Blood Group A and B	Carried on H Ags: Abs to these are both IgG and IgM. IgG Abs are useful for studies involving flow cytometry or tissue staining but have not been selected for haemagglutination. IgM Abs provide blood grouping reagents.
CD174	Lewis Y	The Le <sup>a</sup> Ag is a carbohydrate structure. Depending on the tissue of origin, the Ag is found on cell surfaces and on glycoproteins in exocrine secretions of individuals of genotype se/se, Le/-. Also found in circulating glycosphingolipids which are passively adsorbed to the surface of circulating cells.
CD175	Tn	Tn is a crypt Ag and its expression in some tissues has been associated with oncogenesis. Tn is not expressed on normal haemopoietic cells but becomes exposed as a result of an acquired deficiency of $\beta$ 1,3 D-galactosyl transferase. Exposure of Tn Ag on haemopoietic cells is associated with polyagglutination and, in some cases thrombocytopenia and/or leucopenia. Detection of the Ag prior to the onset of leukaemia has been reported. The Tn Ag has also been described as a useful marker for some types of cancer.

CD	Synonym	Function
CD233	Erythrocyte band 3, EPB3, anion exchange protein 1, AE1	<p>It is an integral membrane protein in human erythrocytes and comprises two domains that are structurally and functionally distinct. The cytoplasmic 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 C-terminal membrane-associated domain functions 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 of CD233 during biosynthesis.</p> <p>Available Abs react to different epitopes located on either the extracellular or intracellular domains of Band 3 anion transport protein. 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 acid secretion in the kidney leading to distal renal tubular acidosis. Other CD233 mutations that do not give rise to disease result in novel blood group Ags, which form the Diego blood group system.</p>
CD235a	Glycophorin A, MN blood group Ag	<p>GPA is the major sialoGP of human erythrocytes and is the most abundant, together with band 3, with which it appears to be associated. It probably also forms complexes with other membrane GPs. GPA is a marker for erythroid cells.</p> <p>M and N Abs have been used in a flow cytometric assay to determine the significance of raised numbers of cells with the M-N- phenotype in disease, particularly in cancer. This assay is a good predictor of mutagenesis and can be used for environmental and radio/chemo-therapy monitoring.</p>

CD	Synonym	Function
CD233/ 235a	Wr <sup>b</sup>	The Wr <sup>b</sup> Ag is defined as the amino acid sequence at residue 658 erythrocyte band 3. The Ag is stabilised by the association between band 3 and Glycophorin A (CD 235a). It is found only on erythroid cells. Wr <sup>b</sup> causes a reduction of red cell membrane deformability and inhibits invasion by malarial parasites.
CD236R	Glycophorin C	Found on erythrocytes and has a functional role in the regulation of red cell shape and membrane mechanical properties through the interaction of the cytoplasmic domain with membrane protein 4.1 within the cytoskeleton.
CD238	Kell	Blood group Kell Ag is found on human erythrocytes, liver sinusoidal cells and testis with weaker expression in a large number of other tissues such as brain and lymphoid tissues. On erythrocytes, Kell is linked by a single disulfide bond to XK. The absence of XK, as occurs in the McLeod phenotype, is associated with a set of clinical symptoms that include nerve and muscle disorders and red cell acanthocytosis. Kell related and Kp <sup>bc</sup> Abs are available.
CD239	Lutheran, B-cell adhesion molecule (B-CAM)	Lu has possible receptor and signal-transduction function. The Lu Ags appear to be restricted to red cells in peripheral blood, but they or related molecules are widely expressed in human tissues, are present in large amounts in kidney endothelium, and the GP is developmentally regulated in human liver. Lu is a specific adhesive receptor for the extracellular matrix protein human laminin 10/11. Lutheran and Lu <sup>b</sup> Abs are available.
CD240	Rh	Rh is the most complex of the human blood group systems, with 45 well-defined Ags.
CD240CE	RhCE	Found on erythrocytes.
CD240D	RhD	Found on erythrocytes.

### Others Abs available to:

1. HLA
2. NK
3. Complement C3d
4. Membrane proteins spectrin, ankyrin and Protein 4.2

## Cell lines are available for commercial licensing

### Diagnostic Antibodies

Major IgM Blood Grouping	A, B and D
Minor Blood Grouping	A/A1, B, N, D, E, Le, Le <sup>a</sup> , Lu, Lu <sup>b</sup> , Wr <sup>b</sup>
Other	C3c, C3d, IgG, IgG control, IgM control

### Research Antibodies

Erythrocytes	A, B RhD, CD173, 175, 233, 235a, 236R, 238, 239, 240
Cytoskeletal	Spectrin, Ankyrin, Protein 4.2, Glut-1
Platelet and granulocytes	CD29, 41, 42b, 49b, 61, 66b
Many cells/tissues	CD44, 47, 55, 58, 59, 239
HLA/stem cells/ Leucocytes/other	Class I A and B, CD34, 45RA, 50, NK, GM-CSF, ENA



### Contact PDPU for data sheets, prices and further information.

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