

## International Blood Group Reference Laboratory

500 North Bristol Park  
Northway  
Filton  
Bristol  
BS34 7QH

<b>Antigen</b>	CD34
<b>Clone</b>	BIRMA K3
<b>Product Code</b>	9437
<b>Immunoglobulin Class</b>	Mouse IgG1, κ kappa light chain

## Protein Development and Production Unit

**Tel:** +44 (0)117 921 7500

**Fax:** +44 (0)117 912 5796

**Website:** <http://ibgri.blood.co.uk>

**Email:** [enquiries.IBGRL@nhsbt.nhs.uk](mailto:enquiries.IBGRL@nhsbt.nhs.uk)

### Antigen Description and Distribution

The CD34 antigen is a 105-120 kDa single transmembrane glycoprotein encoded by a gene located on chromosome 1<sup>1</sup>. It is expressed on most haematopoietic colony forming cells from human bone marrow, including unipotent (BFU-E, CFU-GM, CFU-meg, CFU-Eo, CFU-Osteoclast) and multipotent progenitors (CFU-mix or CFU-GEMM, pre-CFU, CFU-Blast)<sup>2-4</sup>. CD34 appears to be expressed at the highest levels on the earliest progenitors, and to decrease progressively with maturation<sup>2</sup>. CD34 is a stage-specific, rather than a lineage-specific, leucocyte differentiation antigen. The most immature definable B-lymphoid precursors (CD19-positive/CD10-positive/TdT-positive) are CD34 positive. Based on bone-marrow transplant data and the expression of CD34 on rare cases of T cell leukaemias, CD34 is presumably expressed on progenitors for T cells as well<sup>2,5</sup>. Monoclonal antibodies (Mabs) to CD34 can be confined to three main classes and are defined from the sensitivity of the corresponding CD34 epitopes to degradation by enzymes such as neuraminidase, chymopapain and a glycoprotease from *P. haemolytica*. The expression of CD34 in malignancies appears to parallel normal cellular expression. The following haematopoietic malignancies are CD34 positive: Some acute myeloid leukaemias, undifferentiated leukaemias and acute lymphoblastic leukaemias<sup>2,4,6,7,8</sup>. In contrast, chronic lymphocytic leukaemias, lymphomas, myelomas and non-haematopoietic malignancies are CD34 negative<sup>2,4,8</sup>.

### Clone

BIRMA K3 was produced from a mouse hybridoma derived from the fusion of Balb/c spleen cells with X63Ag8.653 myeloma cells. BIRMA K3 reacts with CD34 present on immature haematopoietic cells in the bone marrow and umbilical cord by immunoblotting and immunostaining. BIRMA K3 is a class III Mab that recognizes a CD34 epitope which is resistant to degradation by glycoproteases<sup>10</sup>. BIRMA K3 labels immature lymphohaematopoietic progenitor cells<sup>2</sup>. BIRMA K3 can be used in immunostaining by flow cytometry. It has also been used successfully on cytocentrifuged cell preparations using the APAAP technique and in immunohistochemical studies have shown that BIRMA K3 reacts specifically with capillary endothelial cells. BIRMA K3 was submitted to the 6th leucocyte workshop<sup>11</sup>. FITC labelled BIRMA K3 resulted in staining of acute leukemias and CD34+ cell counts in patients submitted to high dose chemotherapy and stem cell transplantation<sup>10</sup>.

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