

Immunoglobulins for Flow Cytometry

IgA, IgD, IgG, IgM



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Immunoglobulins are heterodimeric protein molecules composed of 2 heavy and 2 light-chain molecules that are produced by plasma cells in response to an immunogen. **It is their ability to recognize specific antigens that makes immunoglobulins suitable as a tool in diagnosis of various diseases.**

Antigen exposure activates the production of immunoglobulins which evolve from premature B-cell precursors in a primary response, or from memory cells in a secondary response. A majority of B cells, with the exception of pre-B progenitor and pre-B cells, and mature plasma cells, express immunoglobulins on their surface. The maturing B lymphocytes produce IgD that is inserted into the cell membrane joining IgM and establishing a population of IgM + IgD + B lymphocytes, which is the largest population of circulating B lymphocytes in man. Subsequent rearrangement of the constant region of the immunoglobulin heavy-chain genes results in cells expressing membrane IgG or IgA (1).

IgA: IgA occurs in relatively low concentrations in serum, but in general more IgA is produced than all other isotypes combined. Most IgA exists in the form of secretory IgA in mucosal cavities, milk and colostrum. Antibodies to IgA are useful for the demonstration of cell surface IgA, and, thus, for the subtyping of B-cell lymphoproliferative disorders together with a panel of other antibodies. In diagnosis of B-cell chronic lymphocytic leukemia (B-CLL), the amount of surface-IgA-positive cells are seen in only 0-8% of cases (2-6).

IgD: IgD is predominantly found as a membrane immunoglobulin on the surface of mature naive B cells and is responsible for B-cell immune response initiation. High levels of secreted IgD can be found in individuals with immunodeficiencies. B-cell chronic lymphocytic leukemia (B-CLL) cells are commonly positive for surface IgD (2-6). Moreover, IgD-positive cases are frequently seen in B-cell prolymphocytic leukemia, hairy cell leukemia, splenic lymphoma with villous lymphocytes, mantle cell lymphoma, and follicular cell lymphoma (2, 5).

IgG: IgG is the most common isotype found in serum, comprising about 70% of the circulating antibody. IgG antibodies are usually of high affinity and predominate in a secondary or memory immune response. B-cell chronic lymphocytic leukemia (B-CLL) cells are commonly positive both for surface IgM and IgD, whereas surface-IgG-positive cells are seen in 3-25% of cases (2-6). IgG-positive cases are frequently seen in hairy cell leukemia, splenic lymphoma with villous lymphocytes, and follicular cell lymphoma (2, 5).

IgM: IgM is the first isotype expressed in developing B cells and the first antibody secreted during a primary immune response. The low affinity of the secreted IgM is compensated by its pentameric form, generating multiple binding sites, providing high avidity for antigen, and assisting the binding of large, multimeric antigens. During diagnosis all pre-B-ALL cases express cytoplasmic IgM, whereas B-ALL cases express surface IgM (2). B-cell chronic lymphocytic leukemia (B-CLL) cells are commonly positive for surface IgM (3-6). Moreover, IgM-positive cases are frequently seen in B-cell prolymphocytic leukemia, hairy cell leukemia, splenic lymphoma with villous lymphocytes, mantle cell lymphoma, and follicular cell lymphoma (2, 5).

References

1. Deegan MJ. B lymphocytes and plasma cells: their development and identification. In: Keren DF, editor. Flow cytometry in clinical diagnosis. Chicago: ASCP Press; 1989. p. 139-6.
2. van Dongen JJM, Adriaansen HJ. Immunobiology of leukaemia. In: Henderson ES, Lister TA, Greaves MF, editors. Leukemia. Philadelphia, London, Toronto, Montreal, Sydney, Tokyo: WB Saunders Company; 1996. p. 83-130.
3. Geisler CH, Larsen JK, Hansen NE, Hansen MM, Christensen BE, Lund B, et al. Prognostic importance of flow cytometric immunophenotyping of 540 consecutive patients with B-cell chronic lymphocytic leukemia. Blood 1991;78:1795-1802.
4. Gandini D, Lanza F, Latorraca A, Levato F, Del Senno L, Castoldi G. Immunophenotypic and genotypic characterization of B-cell chronic lymphocytic leukemia patients from Northern Italy. Haematologica 1993;78:18-24.
5. Batata A, Shen B. Immunophenotyping of subtypes of B-chronic (mature) lymphoid leukemia. A study of 242 cases. Cancer 1992;70:2436-43.
6. Shen PUF, Fuller SG, Rezuze WN, Sherburne BJ, DiGiuseppe JA. Laboratory, morphologic, and immunophenotypic correlates of surface immunoglobulin heavy chain isotype expression in B-cell chronic lymphocytic leukemia. Am J Clin Pathol 2001;116:905-12.
7. Cartron G, Linassier C, Bremond JL, Desablens B, Georget MT, Fimbel B, et al. CD5 negative B-cell chronic lymphocytic leukemia: clinical and biological features of 42 cases. Leuk Lymphoma 1998;31:209-16.

ORDERING INFORMATION

Product	Size	Code	
		FITC	RPE
Polyclonal Rabbit Anti-Human IgA, Specific for Alpha-Chains	100 tests, 1 ml	F0188	
Polyclonal Rabbit Anti-Human IgD, Specific for Delta-Chains	100 tests, 1 ml	F0189	R5112
Polyclonal Rabbit Anti-Human IgG, Specific for Gamma-Chains	100 tests, 1 ml	F0185	
Polyclonal Rabbit Anti-Human IgM, Specific for Mu-Chains	100 tests, 1 ml	F0058	R5111
Controls			
Rabbit F(ab') ₂	100 tests, 1 ml	X0929	X0930

The above Dako immunoglobulins have all been produced from a F(ab')₂ fragment of affinity-isolated polyclonal rabbit antibodies.
EU regulatory status: CE-IVD



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