# Biotinylated Human CD20 / MS4A1 Full Length Protein, His, Avitag™ (HEK293)

**Catalog#CD20KN187**

**Background**
B-lymphocyte antigen CD20 is also known as B-lymphocyte surface antigen B1, Leukocyte surface antigen Leu-16, Membrane-spanning 4-domains subfamily A member 1 and MS4A1, is an activated-glycosylated phosphoprotein expressed on the surface of all B-cells beginning at the pro-B phase (CD45R+, CD117+) and progressively increasing in concentration until maturity. CD20 is expressed on all stages of B cell development except the first and last; it is present from late pro-B cells through memory cells, but not on either early pro-B cells or plasma blasts and plasma cells. It is found on B-cell lymphomas, hairy cell leukemia, B-cell chronic lymphocytic leukemia, and melanoma cancer stem cells. The protein has no known natural ligand and its function is to enable optimal B-cell immune response, specifically against T-independent antigens. It is suspected that it acts as a calcium channel in the cell membrane. CD20 / MS4A1 is the target of the monoclonal antibodies (mAb) rituximab, Ibritumomab, tiuxetan, and tositumomab, which are all active agents in the treatment of all B cell lymphomas and leukemias. Defects in CD20 / MS4A1 are the cause of immunodeficiency common variable type 5 (CVID5); also called antibody deficiency due to CD20 defect. CVID5 is a primary immunodeficiency characterized by antibody deficiency, hypogammaglobulinemia, recurrent bacterial infections and an inability to mount an antibody response to antigen.

**Synonym**
MS4A1,CD20,MS4A-1

**Source**
Biotinylated Human CD20 Full Length, His,Avitag is expressed from human 293 cells (HEK293). It contains AA Met 1 - Pro 297 (Accession #P11836-1).Predicted N-terminus: Met 1

Molecular Characterization
Nanodiscs are a new class of model membranes that are being used to solubilize and study a range of integral membrane proteins (mp, full length CD20) and membrane-associated proteins. The Nanodisc bilayer is bounded by a membrane scaffold protein (MSP1D1) coat that confers enhanced stability and a narrow particle size distribution.
The CD20 nanodisc assembles from a mixture of full length CD20 protein in detergent, phospholipid micelles and membrane scaffold protein(MSP1D1) upon removal of the detergent. The CD20 carries a polyhistidine tag at the C-terminus followed by an Avi tag with calculated MW of 36.9 kDa and migrates as 43 kDa under reducing (R) condition (SDS-PAGE) due to glycosylation. The membrane scaffold protein（MSP1D1）has calculated MW of 24.7 kDa, and it migrates as 25 kDa under reducing (R) condition (SDS-PAGE).

**Biotinylation**
Biotinylation of this product is performed using Avitag™ technology. Briefly, the single lysine residue in the Avitag is enzymatically labeled with biotin.

**Endotoxin**
Less than 1.0 EU per μg by the LAL method.

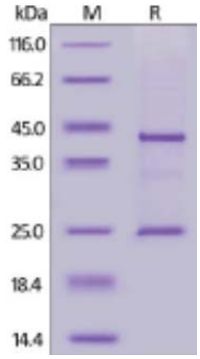
**Purity**
>90% as determined by SDS-PAGE.

**Formulation**
Lyophilized from 0.22 μm filtered solution in 20 mM HEPES, 150 mM NaCl, pH7.5. Normally trehalose is added as protectant before lyophilization.

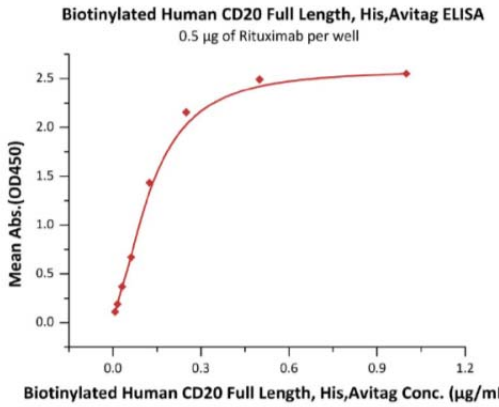
**Storage**
For long term storage, the product should be stored at lyophilized state at -20°C or lower.
Please avoid repeated freeze-thaw cycles. This product is stable after storage at:
-20°C to -70°C for 12 months in lyophilized state;
-70°C for 3 months under sterile conditions after reconstitution.

● An empty/mock (no CD20) nanodisk is included in this product as negative control

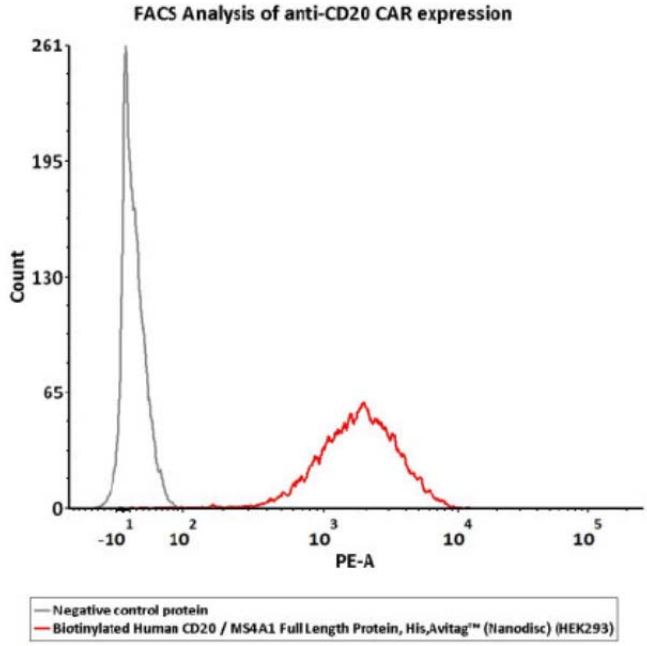
**SDS Page**




Biotinylated Human CD20 Full Length, His,Avitag on SDS-PAGE under reducing (R) condition. The gel was stained overnight with Coomassie Blue. The purity of the protein is greater than 90%.




Immobilized Rituximab at 5 μg/mL (100 μL/well) can bind Biotinylated Human CD20 Full Length, His,Avitag with a linear range of 0.008-0.125 μg/mL (QC tested).




2e5 of CD20-CAR-293 cells transfected with anti-CD20-scFv were stained with 100 μL of 3 μg/mL of Biotinylated Human CD20 Full Length, His,Avitag and negative control protein respectively, washed and then followed by PE-SA and analyzed with FACS (QC tested).

**References**

(1) Walport M, et al., 2008, Janeway's Immunobiology (7th ed.). New York: Garland Science.
(2) Bonilla FA, Bona CA., 1996, Textbook of Immunology. Boca Raton: CRC. p. 102.
(3) Cragg MS., 2005., Curr. Dir. Autoimmun. 8: 140–74.