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BioSim™ anti-Rituximab (Mabthera®) (Human) ELISA Kit

rev11/17

(Catalog # E4385-100, 100 assays, Store at 4°C)

I. Introduction:

Rituximab (Mabthera®) is a genetically engineered chimeric murine/human monoclonal antibody specific to CD20. CD20 is an approximately 35 KDa transmembrane phosphoprotein involved in the activation, proliferation, and differentiation of B-lymphocytes. It is absent in terminally differentiated plasma cells. The Fab domain of rituximab binds to the CD20 antigen on B-lymphocytes and the Fc domain recruits immune effector functions to induce apoptosis in B cells. It is used in treating leukemias and lymphomas, some autoimmune disorders, and organ transplant. However, some patients develop unwanted immunogenicity, which leads to production of anti-drug-antibodies (ADAs) inactivating the therapeutic effects of the treatment and, in rare cases, inducing adverse effects. BioVision's BioSim™ anti-Rituximab ELISA kit is designed to quantify/measure the antibody against Rituximab with high specificity and sensitivity in biological matrices.

II. Application:

This ELISA kit is used for *in vitro* quantitative determination of antibody against Rituximab in serum and plasma
Detection Range: 62 - 500 ng/ml
Sensitivity: 30 ng/ml
Assay Precision: Intra-Assay: CV < 15%; Inter-Assay: CV < 15% (CV (%) = SD/mean X 100)
Cross Reactivity: Rituximab (Rituxan®, Mabthera®) infusion camouflages/masks the presence of antibody to rituximab (ATR) in serum/plasma samples. Therefore, blood sampling time is critical for detection of ATR. It is convenient to obtain blood sample just before the infusion or at least 2 weeks after the infusion of Rituximab (Rituxan®, Mabthera®)
Recovery rate: 85 – 115% with normal human serum samples with known concentrations

III. Sample Type:

Human serum and plasma

IV. Kit Contents:

Components	E4385-100	Part No.
Micro ELISA Plate	1 plate	E4385-100-1
Rituximab Standards (S1 – S7)	1 ml X 7	E4385-100-2.x
Assay Buffer	50 ml	E4385-100-3
Confirmation Reagent	12 ml	E4385-100-4
Peroxidase Conjugate	12 ml	E4385-100-5
TMB substrate (Avoid light)	12 ml	E4385-100-6
Stop Solution	12 ml	E4385-100-7
Wash buffer (20X)	50 ml	E4385-100-8
Plate sealers	2	E4385-100-9

V. User Supplied Reagents and Equipment:

- Microplate reader capable of measuring absorbance at 450 nm
- Calibrated measures
- Precision pipettes with disposable tips
- Clean eppendorf tubes for preparing standards or sample dilutions
- Absorbent paper

VI. Storage and Handling:

The entire kit may be stored at 4°C for up to 12 months from the date of shipment.

VII. Reagent and Sample Preparation:

Note: Prepare reagents within 30 minutes before the experiment.
Before using the kit, spin tubes and bring down all components to the bottom of tubes.

1. **Wash Buffer**: Dilute the 20X Wash Buffer to 1X solution in ddH_2O (10 ml of Wash Buffer stock to 190 ml of ddH_2O). Mix the 1X solution thoroughly by vortex manually. The working stock can be stable for 2 weeks after preparation at 4°C.
2. **Standard Preparation:**
Ready to use

Name	S1	S2	S3	S4	S5	S6	S7
Conc. (ng/ml)	500	250	125	62	0	High Control	Low Control

3. **Sample Dilution:**
   - **Serum/Plasma**: First dilute samples at 1:10 (20 µl Serum/Plasma + 180 µl ddH_2O) or 1:100 (5 µl diluted sample + 495 µl ddH_2O)
   - Diluted samples should further be diluted if the concentration of rituximab is higher than the measuring range.

FOR RESEARCH USE ONLY! Not to be used on humans.

- The usual precautions for venipuncture should be observed. Samples are stable at 4°C for 7 days and -20°C for 6 months. Avoid freeze-and-thaw cycle.

4. **Confirmation Test Mixture:** Mix 20 µl undiluted (positive) serum/plasma sample with 180 µl confirmation reagent for 60 minutes in a microtube prior to the test.

VIII. Assay Protocol:

Note: Bring all reagents, microplate and samples to room temperature 15 minutes prior to the assay.
It is recommended that all standards and samples be run at least in duplicate.
A standard curve must be run with each assay.

1. Prepare all reagents, samples and standards as instructed in section VII.
2. Add 100 µl of **standards, controls, diluted-samples**, and **confirmation test mixture** (if applicable) into appropriate wells. Cover wells and incubate for 60 minutes at room temperature (RT).
3. Discard incubation solution. Wash plate 3 times each with 300 µl of diluted **Wash Buffer**. Remove excess solution by tapping the inverted plate on a paper towel.
4. Add 100 µl of **Peroxidase Conjugate** into each well. Cover wells with adhesive plate sealer and incubate at RT for 60 minutes.
5. Discard the solution and wash the wells as step 3.
6. Add 100 µl of 1X **TMB substrate** solution and incubate the plate in dark at RT for 20 minutes
7. Add 100 µl of **Stop solution** to stop the reaction
8. Read the absorbance in micro plate reader set to 450 nm within 20 minutes. (reference wavelength to 650 nm)

IX. QUANTITATIVE CALCULATION:

Using the standards disregarding zero standard, construct a standard curve by plotting the OD450/650 nm for each standard on the Y-axis versus the corresponding rituximab concentration on the X-axis. Construct a standard curve of difference data using software capable of generating four parameter logistic (4PL) or point-to-point calculation curve fit. To obtain the exact values of the samples, the concentration determined from the standard-curve should be multiplied by the dilution factor.

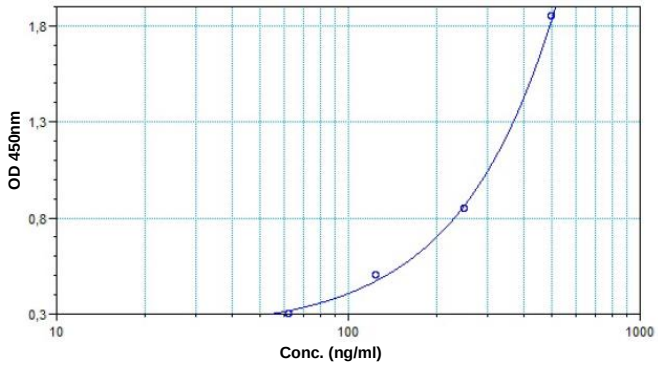

Figure: Typical Standard Curve: These standard curves are for demonstration only. A standard curve must be run with each assay.

X. QUALITATIVE INTERPRETATION:

- If "Sample $OD_{450/650}$ / Zero Standard (S5) $OD_{450/650}$" is < 3, the sample is NEGATIVE for Antibody to Rituximab (ATR)
- If "Sample $OD_{450/650}$ /Zero Standard (S5) $OD_{450/650}$" is ≥3, the sample is POSITIVE for ATR and if required samples may be extrapolated for quantitative analysis and confirmation.
- For the run to be valid, the OD450/650 nm of Positive Control (Standard A) should be ≥ 1.000 and the OD450/650 nm of each Negative Control should be <0.200, if not, improper technique or reagent deterioration may be suspected and the run should be repeated.
- Interpretation of true and false positive: For true positive sample, inhibition should be equal or greater than 25%

$$\frac{OD_{(450/650)}\text{ sample} - OD_{(450/650)}\text{ sample w/confirmation reagent}}{OD_{(450/650)}\text{ sample}} \times 100 = \text{inhibition \%}$$

XI. RELATED PRODUCTS:

- BioSim™ Rituximab (Mabthera®) (Human) ELISA Kit (Cat. No. E4371-100)
- BioSim™ Adalimumab (Humira®) (Human) ELISA Kit (Cat. No. E4372-100)
- BioSim™ Bevacizumab (Avastin®) (Human) ELISA Kit (Cat. No. E4373-100)
- BioSim™ Etanercept (Enbrel®) (Human) ELISA Kit (Cat. No. E4374-100)
- BioSim™ Infliximab (Remicade®) (Human) ELISA Kit (Cat. No. E4375-100)
- BioSim™ Trastuzumab(Herceptin®)(Human) ELISA Kit (Cat. No. E4376-100)
- BioSim™ Golimumab (Simponi®)(Human) ELISA Kit (Cat. No. E4377-100)
- BioSim™ Infliximab (Remsima®)(Human) ELISA Kit (Cat. No. E4378-100)

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- BioSim™ Cetuximab (Erbitux®)(Human) ELISA Kit (Cat. No. E4379-100)
- BioSim™ Denosumab (Prolia®)(Human) ELISA Kit (Cat. No. E4380-100)
- BioSim™ Omalizumab (Xolair®)(Human) ELISA Kit (Cat. No. E4381-100)
- BioSim™ Nivolumab (Opdivo®)(Human) ELISA Kit (Cat. No. E4382-100)
- BioSim™ Pembrolizumab (Keytruda®)(Human) ELISA Kit (Cat. No. E4383-100)
- BioSim™ Ipilimumab (Yervoy®)(Human) ELISA Kit (Cat. No. E4384-100)
- BioSim™ Rituximab (Mabthera®) (Human) ELISA Kit (Cat. No. E4385-100)
- BioSim™ Trastuzumab (Herceptin®) (Human) ELISA Kit (Cat. No. E4386-100)
- BioSim™ Infliximab (Remicade®) (Human) ELISA Kit (Cat. No. E4387-100)
- BioSim™ Adalimumab (Humira®) (Human) ELISA Kit (Cat. No. E4388-100)
- BioSim™ Bevacizumab (Avastin®) (Human) ELISA Kit (Cat. No. E4389-100)
- BioSim™ Infliximab (Remsima®) (Human) ELISA Kit (Cat. No. E4390-100)
- BioSim™ Cetuximab (Erbitux®) (Human) ELISA Kit (Cat. No. E4391-100)
- BioSim™ Etanercept (Enbrel®) (Human) ELISA Kit (Cat. No. E4392-100)
- BioSim™ Golimumab (Simponi®) (Human) ELISA Kit (Cat. No. E4393-100)
- BioSim™ Denosumab (Prolia®) (Human) ELISA Kit (Cat. No. E4394-100)
- BioSim™ Omalizumab (Xolair®) (Human) ELISA Kit (Cat. No. E4395-100)
- BioSim™ Nivolumab (Opdivo®) (Human) ELISA Kit (Cat. No. E4396-100)
- BioSim™ Pembrolizumab (Keytruda®) (Human) ELISA Kit (Cat. No. E4397-100)
- BioSim™ Ipilimumab (Yervoy®) (Human) ELISA Kit (Cat. No. E4398-100)
- BioSim™ Filgrastim (Herceptin®) (Human) ELISA Kit (Cat. No. E4399-100)