Anti-Human CD2 (TP1/31)

Fluorochrome	Reference	Test
FITC	2F-100T	100 test
PE	2PE-100T	100 test

IVD CE immunostep we know how

PRODUCT DESCRIPTION

Other Names: T11, LFA-2, CD2R, E-rosette receptor, Erythrocyte receptor, LFA-3 receptor, Rosette receptor, T-cell surface antigen T11/Leu-7.
Description: The anti-CD2 monoclonal antibody derives from PMA and Ionomycin activated T cells blast (human).
Clone: TP1/31
Isotype: Mouse IgG1, kappa
Reactivity: Human
Source: Supernatant proceeding from an *in vitro* cell culture of a cell hybridoma.
Purification: Affinity chromatography.
Compositión: Mouse anti-human CD2 monoclonal antibody conjugated with a fluorochrome and in an aqueous solution which contains stabilising protein and 0.09% sodium azide (NaN_3).

Fluorochrome	Reagent provided	Concentration (µg/ml)
FITC (Fluorescein isothiocyanate)	100 ug in 2 ml	50
PE (R-Phycoerythrin)	50 ug in 2 ml	25

RECOMMENDED USAGE

Immunostep's CD2, clone TP1/31, is a monoclonal antibody intended for *in vitro* diagnostic use in the identification and enumeration of human peripheral T lymphocytes and 90% of the thymocytes using flow cytometry.

CLINICAL RELEVANCE

The Immunostep CD2 monoclonal antibody may also be used as marker in the assessment of lymphoid malignancies as it is expressed in the majority of precursor and posthymic lymphomas and leukemias. In some neoplastic T-cell populations e.g. in peripheral T cell lymphomas, CD2 may be aberrantly deleted[1-6].

PRINCIPLES OF THE TEST

The anti-CD2 monoclonal antibody binds to the surface of cells that express the CD2 antigen. To identify these cells, the sample is incubated with the antibody and is analysed by flow cytometry.

APPROPRIATE STORAGE AND HANDLING CONDITIONS

Store in the dark, refrigerated between 2 °C and 8 °C. DO NOT FREEZE. The antibody is stable until the expiry date stated on the vial label if kept at 2°C-8°C. Do not use after the date indicated.

Once the vial is open, the product is stable for 90 days.

EVIDENCE OF DETERIORATION

Reagents should not be used if any evidence of deterioration is observed. For more information, please contact our technical service: tech@immunostep.com
The product's normal appearance is a semi-transparent, colourless liquid. It should not be used if liquid medium is cloudy or contains precipitate. It should be odourless.

RECOMMENDATIONS AND WARNINGS ⚠

a) The reagents contain sodium azide. In acid conditions, it is transformed into hydrazoic acid, a highly toxic compound. Azide compounds must be diluted in running water before being discarded. These conditions are recommended so as to avoid deposits in plumbing, where explosive conditions could develop. The safety data sheet (SDS) is available online at www.immunostep.com
b) Avoid microbial contamination of the reagent.
c) Protect from light. Use dim light during handling, incubation with cells and prior to analysis.
d) Never mouth pipette.
e) In the case of contact with skin, wash in plenty of water.
f) The samples should be handled in the same way as those capable of transmitting infection. Appropriate handling procedures should be guaranteed.
g) Do not use after the expiry date indicated on the vial.
h) Deviations from the recommended procedure could invalidate the analysis results.
i) FOR *IN VITRO* DIAGNOSTIC USE.
j) For professional use only.
k) Before acquiring the samples, it is necessary to make sure that the flow cytometer is calibrated and compensated.

SAMPLE COLLECTION

The extraction of venous blood samples should be carried out in blood collection tubes using the appropriate anticoagulant (EDTA or heparin)[7,8]. For optimum results, the sample should be processed during the six hours following the extraction. Samples which cannot be processed within the 48 hours following the extraction should be discarded.

MATERIALS REQUIRED BUT NOT PROVIDED

- Isotype controls:

Fluorochrome	Isotype control	Immunostep Reference
PE	Mouse IgG1	ICIGG1PE-50
FITC		ICIGG1F-100

- Centrifuge
- Commonly used 12 x 75-mm flow cytometry assay tubes
- Micropipettes for dispensing volumes from 5 µl to 2 ml
- Blood collection tubes with anticoagulant.
- Phosphate buffered saline (PBS) with 0.09% sodium azide. It is recommendable to add 0.5% BSA
- Vacuum system
- Lysing solution
- Flow cytometer equipped with laser and appropriate fluorochrome filters
- Vortex Agitator

SAMPLE PREPARATION:

1. Add the suggested volume indicated on the antibody vial to a 12x75-mm cytometer tube. It is advisable to prepare an additional tube with the appropriate isotype control *(please see materials required but not provided).*
2. Add 100 µL of sample (up to 10^6 cells) and mix properly in the vortex.
3. Incubate in the dark for 15 minutes at room temperature (20-25°C) or for 30 minutes at 4°C.
4. Add 2 ml of the lysing solution, mix in the vortex and incubate in the dark for 10 minutes or until the sample is lysed.
5. Centrifuge at 540g for five minutes and carefully withdraw the supernatant by suction so as not to touch the cell pellet. Leave 50 µl of non-aspirated liquid.
6. Resuspend pellet.
7. Add 2 ml of PBS *(please see materials required but not provided).*
8. Centrifuge at 540g for five minutes and carefully withdraw the supernatant by suction so as not to touch the cell pellet. Leave 50 µl of non-aspirated liquid.
9. Resuspend the pellet in 0.3 ml of PBS.

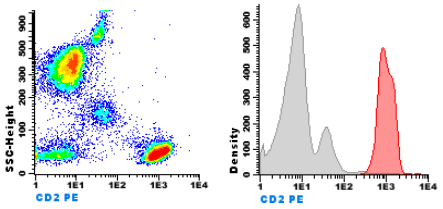
Acquire on a flow cytometer or store in the dark at 2°C -8°C until the analysis is carried out. Samples should be acquired within the 3 hour after lysis.

FLOW CYTOMETRY ANALYSIS

Collect the fluorescence attributed to monoclonal antibody CD2 and determine the percentage of stainend cells.

It is necessary to use an isotype control conjugated with the same fluorochrome, of the same type of immunoglobulin heavy chain and concentration as that of the CD1a, so as to evaluate and correct the unspecific binding of leucocytes *(please see materials required but not provided).* Set an analysis region to eliminate fluorescence background noise and to include positively stained cells.

Below is an example diagram of stained cells:



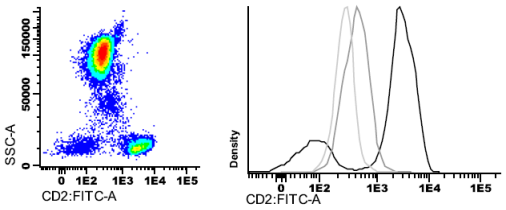


Fig. 1: On the left, a biparametric diagram of the average fluorescence intensity of the CD2+ lymphocyte population and its internal complexity (SSC) in a peripheral blood specimen from a healthy donor. On the right, a diagram of the same specimen in histogram format.

LIMITATIONS OF THE PROCEDURE

1. Incubation of antibody with cells for other than the recommended procedures may result in a reduction or loss of antigenic determinants from the cell surface.
2. The values obtained from normal individuals may vary from laboratory to laboratory; it is therefore suggested that each laboratory should establish its own normal reference range.
3. Abnormal cells or cell lines may show a higher antigen density than normal cells. In some cases, this could require the use of a greater quantity of monoclonal antibody than is indicated in the procedures for sample preparation.
4. In whole blood samples, red blood cells found in abnormal samples, as well as nucleated red cells (from both normal and abnormal specimens) may be resistant to lysis. Longer periods of red blood cell lysing may be needed in order to avoid the inclusion of unlysed cells in the lymphocyte gated region.
5. Blood samples should not be refrigerated for an extensive period (more than 24 hours), since the number of viable cells will gradually decrease, and this may have an effect on the analysis. In order to obtain the best values, they should be
6. kept at room temperature immediately prior to incubation with the monoclonal antibody.
7. Accurate results with flow cytometric procedures depend on correct alignment and calibration of the lasers, as well as correct gate settings.

REFERENCE VALUES

Abnormal results in the percentage of cells expressing the antigen or in its levels of expression may be due to pathological conditions. It is advisable to know the normal antigen expression patterns in order to ensure a proper interpretation of the results[9]

The values obtained from healthy individuals may vary from laboratory to laboratory; it is therefore suggested that each laboratory should establish its own normal reference range.

CHARACTERISTICS

SPECIFICITY

To evaluate the reagent's Specificity 10 blood samples from healthy donors were studied stained with an adequate isotype control and the Mab CD2 PE to study. The percentage of lymphocytes, monocytes and granulocytes stained with the mentioned MAb was evaluated. The results obtained are shown in the following table:

Sample	Lymphocytes	Monocytes	Granulocytes
SPN1	82,22	11,44	0,84
SPN2	84,23	6,82	0,48
SPN3	79,78	10,78	0,41
SPN4	77,07	4,74	0,37
SPN5	69,38	11,96	1,00
SPN6	81,42	8,22	0,57
SPN7	67,6	7,80	0,33
SPN8	55,07	11,20	0,73
SPN9	81,98	8,86	0,47
SPN10	83,39	3,35	0,51
10	10	10	10

		Lymphocytes	Monocytes	Granulocytes
N	Valid	10	10	10
	Missing	0	0	0
Mean		76,21	8,51	0,57
Median		80,60	8,54	0,49
Mode		55,07	3,35	0,33
Std. Desviation		9,39	2,93	0,21
Variance		88,17	8,58	0,04

SENSIBILITY

Sensitivity of the Immunostep CD2 monoclonal antibodies was determined by staining a blood sample from a normal donor. Dilutions of a peripheral blood sample were made to check the concentration scale of stained cells obtained. The results show an excellent correlation level between the results obtained and expected based on the dilution used.

To determine the consistency of the conjugated monoclonal antibody CD2 FITC as opposed to small variations (but deliberate). It provides an indication of its reliability during its normal use

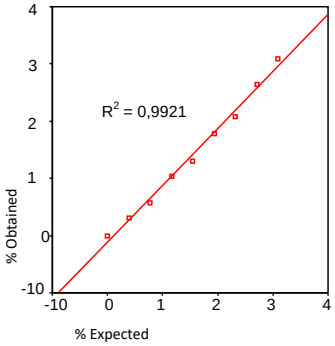
Case Summaries

	Sample	Dilution	Expected	Obtained
1	400µl A + 0µl B	100,00	21,38	21,38
2	350µl A + 50µl B	87,50	18,70	19,70
3	300µl A + 100µl B	75,00	16,03	15,96
4	250µl A + 150µl B	62,50	13,36	12,99
5	200µl A + 200µl B	50,00	10,69	9,95
6	150µl A + 250µl B	37,50	8,01	8,64
7	100µl A + 300µl B	25,00	5,34	6,12
8	50µl A+ 350µl B	12,50	2,67	2,82
9	0µl A + 400µl B	0,00	0,00	0,00
N	9	9	9	9

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,997(a)	0,994	0,993	0,59824

a Predictors: (Constant), Expected



REPRODUCIBILITY

Reproducibility for the CD2 conjugated monoclonal antibodies was determined by performing 10 replicated determinations of each antibody in each of three CD2+ ranges, high, medium and low. Thus, a total of 30 determinations were performed for each form of CD2. In this manner, reproducibility was demonstrated throughout the entire measuring range.

The 10 determinations for each range were performed by the staining, processing and analysis of 10 separate samples. Lymphocytes were selected for the analysis of percent cells stained in each of the three ranges.

To perform this study, anticoagulated blood was obtained from a normal donor expressing a high percentage of CD2+ cells. Mid-range and low range samples were obtained by mixing known CD2- cells in appropriate ratios, while maintaining the same total cell concentration for the three ranges.

The study was performed in each of three independent laboratories, in the manner that each laboratory obtained, stained and analyzed separate blood samples.

Descriptive Statistics

		N	Minimum	Maximum	Mean	Std. Deviation	variation coefficient
CD2 FITC	High	10	26,24	28,76	27,36	0,77	0,78
	Medium	10	18,11	19,28	18,81	0,36	0,36
	Low	10	15,69	18,17	17,29	0,71	0,71
	Valid (listwise)	10					
CD2 PE	High	10	32,26	39,28	34,0360	2,19240	4,807
	Medium	10	19,18	20,98	20,1750	,58443	,342
	Low	10	2,87	3,83	3,3900	,24775	,061
	Valid N (listwise)	10					

*__Note:__ *Data analyzed with SPSS for Windows 11.0.1*

WARRANTY

Warranted only to conform to the quantity and contents stated on the label or in the product labelling at the time of delivery to the customer. Immunostep disclaims hereby other warranties. Immunostep's sole liability is limited to either the replacement of the products or refund of the purchase price.

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