

Human TNF- α /GM-CSF FluoroSpot kit

Product Code: FS-0915-10

CONTENTS:

- ▶ Monoclonal antibody TNF3/4 (2 x 1500 μ l) red top
Concentration: 0.5 mg/ml
- ▶ Monoclonal antibody 21C11
(1500 μ l) blue top
Concentration: 1 mg/ml
- ▶ Monoclonal antibody TNF5-BAM (600 μ l) blue top
- ▶ Biotinylated monoclonal antibody 23B6 (250 μ l) green top
Concentration: 1 mg/ml
- ▶ Monoclonal antibody anti-BAM-490 (600 μ l)
- ▶ SA-550 (600 μ l)
- ▶ LPS (120 μ l)
Concentration: 0.05 mg/ml
- ▶ Fluorospot plates (10 IPFL plates)
- ▶ Fluorescence enhancer-II (125 ml)

TNF3/4, 21C11 and 23B6 are supplied in sterile filtered (0.2 μ m) PBS with 0.02% sodium azide. TNF5-BAM, SA-550, anti-BAM-490 and Fluorescence enhancer-II contain 0.002% Kathon CG.

STORAGE:

Shipped at ambient temperature. On arrival all reagents except LPS (in the grey box) should be stored refrigerated at 4-8°C. LPS should be stored at -20°C.

Guidelines for Human TNF- α /GM-CSF FluoroSpot

The protocol describes double staining for the detection of human TNF- α and GM-CSF. The protocol may also be adjusted to single staining. IPFL plates are coated with a mixture of mAbs: TNF3/4 for TNF- α and 21C11 for GM-CSF. Cells +/- stimuli are added and secreted TNF- α and GM-CSF will be captured by the specific mAbs. After cell removal, spots are detected in two steps. First, a mixture of TNF5-BAM (TNF- α) and 23B6-biotin (GM-CSF) is added, then a mixture of anti-BAM-490 (TNF- α) and SA-550 (GM-CSF).

A Preparation of plate (sterile conditions)

1. In the same tube, dilute the coating antibodies TNF3/4 to 15 $\mu\text{g/ml}$ and 21C11 to 15 $\mu\text{g/ml}$ in sterile PBS, pH 7.4. Filter the antibody solution using a 0.2 μm , low protein binding filter.
2. Pre-wet the plate membrane by treatment with 35% ethanol, 15 $\mu\text{l/well}$, for maximum 1 minute.
3. Wash plate 5 times with sterile water, 200 $\mu\text{l/well}$.
4. Add 100 $\mu\text{l/well}$ of the antibody solution and incubate overnight at 4-8°C.

B Incubation of cells in plate (sterile conditions)

1. Remove excess antibody and wash plate 5 times with sterile PBS, 200 $\mu\text{l/well}$.
2. Add 200 $\mu\text{l/well}$ of medium containing 10% of the same serum as used for the cell suspensions. Incubate for at least 30 minutes at room temperature to block/condition the membrane.
3. Remove the medium and add the stimuli followed by the cell suspension. Alternatively, cells and stimuli can be mixed before addition to the plate.
4. Put the plate in a 37°C humidified incubator with 5% CO₂ and incubate over night. Do not move the plate during this time and take measures to avoid evaporation (e.g. by wrapping the plate in aluminium foil).

C Detection of spots

1. Remove the cells by emptying the plate and wash 5 times with PBS, 200 $\mu\text{l/well}$.
2. In the same tube, dilute the detection antibodies TNF5-BAM 1:200 and 23B6-biotin to 2 $\mu\text{g/ml}$ in PBS containing 0.1% bovine serum albumin (PBS-0.1% BSA). Filter the antibody solution using a 0.2 μm , low protein binding filter. Add 100 $\mu\text{l/well}$ and incubate for 2 hours at room temperature.
3. Wash as above (step C1).
4. In the same tube, dilute the anti-BAM-490 1:200 and SA-550 1:200 in PBS-0.1% BSA. Filter the solution using a 0.2 μm , low protein binding filter and add 100 $\mu\text{l/well}$. Incubate for 1 hour at room temperature. From this step on, cover the plate to limit light exposure.
5. Wash as above (step C1).
6. Empty the plate and add 50 $\mu\text{l/well}$ of Fluorescence enhancer-II and leave the plate for 15 minutes at room temperature.
7. Empty the plate and remove residual Fluorescence enhancer-II by tapping the plate against clean paper towels.
8. Remove the underdrain (the soft plastic under the plate). Leave the plate in the dark to dry; plate should be completely dry before analysis. Inspect and count spots in a FluoroSpot reader. Store plate in the dark at room temperature.

Hints and comments

The assay is recommended for the analysis of macrophages, monocytes and dendritic cells in purified cell preparations or PBMC. Cells can be stimulated with e.g. LPS or other TLR ligands. These kits have not been evaluated for T cells.

Plates

The IPFL plates included in the kit have a low fluorescent PVDF-based membrane. To obtain maximal antibody binding capacity the plates need to first be activated by a brief treatment with ethanol. It is essential that the membrane is not allowed to dry after the treatment. If this occurs the treatment step (A2-3) needs to be repeated before adding the coating antibodies. The underdrain can be left on the plate all along, but then plates require a longer drying time before spots can be counted (step C8).

Plate washing

Washing of plates can be done using a multi-channel micropipette. In washing steps not requiring sterile conditions (C1-C5), a regular ELISA plate washer can also be used, provided that the washing head is adapted to the ELISpot/FluoroSpot plates.

Serum

The serum should be selected to support cell culture and give low background staining. We recommend the use of fetal calf serum. Alternatively serum-free medium evaluated for cell culture can be used.

Cells

Both freshly prepared and cryopreserved cells may be used in the assay. However it is recommended that the latter are rested for at least one hour to allow removal of cell debris before addition to the plate. Cell numbers need to be selected based on cell type and stimuli used. For LPS-stimulated human PBMC, around 5000 cells/well is recommended. For purified LPS-stimulated monocytes, fewer cells will be required. Protocols with other incubation times have to be established by the user.

Assay controls

The number of cells responding to stimulation is often compared to the number of cells spontaneously secreting cytokine which is determined by incubating the same number of cells in the absence of stimuli. LPS (included in the kit) can be used as a control for cell viability and functionality of the assay. For human PBMC it is recommended to use 50 ng/ml of the included LPS to 5000 cells/well.

Buffers

PBS for washing and dilution should be filtered (0.2 μm) for optimal results. We do not recommend the inclusion of Tween or other detergents in the washing and incubation buffers.

Detection reagents

To reduce unspecific background it is recommended to filter the working dilution of detection reagents. Use a 0.2 μm , low protein binding filter.

Analysis

We recommend the use of an automated FluoroSpot reader equipped with filters for FITC (excitation 490 nm/emission 510 nm) and Cy3 (excitation 550 nm/emission 570 nm). Filters should have high specificity to avoid bleed-through artifacts. Spots identified with FITC filter represent TNF- α producing cells and spots identified with Cy3 filter represent GM-CSF producing cells. Double producing cells are preferentially identified by a computerised overlay of TNF- α and GM-CSF spots. Fluorescent spots may fade due to excessive exposure to light and it is recommended to analyse the plate within one week of development.

NOTE; for research use only.

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