Aptplex™ Human Th1/Th2/Th17 7-Plex Panel

Catalog No：MPA016

Product size：96 T

Intended Use

Aptplex™ Human Th1/Th2/Th17 7-Plex Panel is based on multiplex bead-based technology, enabling simultaneous quantification of multiple analytes from a single sample. This kit is suitable for the *in vitro* quantitative detection of concentrations of the following cytokines in human serum, plasma:

IFN-γ, IL-2, IL-4, IL-6, IL-10, IL-17A, TNF-α

Components

Component	Component Name	96T	Storage
MPA016A	Cytokines Capture Beads	4.8mL×1	2-8℃ shading light
MPA016B	Biotinylated Antibody	9.6 mL×1	2-8℃
MPA016C	SA-PE	9.6 mL×1	2-8℃ shading light
MPA016D	Standard	2vials	2-8℃
MPA016E	Assay Buffer	5mL×1	2-8℃
MPA016F	Wash Buffer	30mL×2	2-8℃
	Plate Sealing Film	5 pieces	
	Manual	1 copy	

Detection Principle

The Aptplex™ assay is a multiplex bead based immunoassay that uses antibody-conjugated magnetic beads with distinct fluorescence intensities to capture target antigens simultaneously. Each target antigen is recognized by a specific capture antibody on the bead and binds with a corresponding biotinylated detection antibody to form a bead-analyte-detection antibody "sandwich complex". Streptavidin-phycoerythrin (SA-PE) binds to the biotinylated detection antibodies producing a fluorescent signal proportional to the amount of each analyte. The fluorescence of each bead is measured using flow cytometry and correlated with a standard curve to determine analyte concentrations.

Detection Sample Types

☑ **Serum** ☑ **EDTA Plasma**

Storage

Material	Storage Conditions	Stability / Notes
Unopened kit	2–8 ℃, protected from light	12 months
Opened kit	2–8 ℃, protected from light	Up to 30 days
Reconstituted standard	2–8 ℃, protected from light	Use within 24 hours.

Sample Collection

1) Serum

Allow whole blood to clot for 1 hour at room temperature or overnight at 2-8 ℃, then centrifuge for 20 min at 1000 × g at 2-8 ℃. Collect the supernatant for the assay.

2) Plasma

Collect using EDTA-Na_2 as an anticoagulant. Centrifuge 15 min at 1000 × g at 2-8 ℃ within 30 min of collection. Collect the supernatant for the assay.

Materials Not Supplied

- Vortex mixer
- 96-well plate thermostatted shaking incubator
- 96-well plate centrifuge
- Flow cytometer (2-laser 6-color configuration, equipped with PE, APC and APC/Cy7 detection channels)
- Magnetic separation plate or magnetic rack.
- **Centrifuge-based washing:** clear U-bottom 96-well plates, 96-well plate centrifuge
- **Magnetic bead-based washing:** clear flat-bottom 96-well plates, magnetic separation plate or magnetic rack

Standard Preparation Procedure

1. Prepare eight 0.6 mL microcentrifuge tubes and label them 0-7. Leave tube 7 empty. Add 150 µL of **Assay Buffer** to tubes 0-6.

2. Reconstitute the lyophilized standard

Briefly centrifuge the tube at 500 × g for 10 s to collect the powder at the bottom.

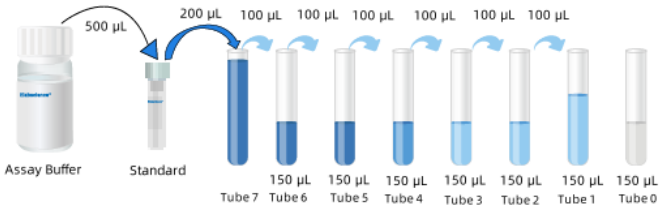
Add 500 µL of **Assay Buffer** to the vial. Let it stand for 5 min.

Mix gently with a pipettor until the standard is completely dissolved.

Transfer 200 µL solution to tube 7. This is the highest concentration standard.

3. Prepare serial dilutions

- Transfer 100 µL from tube 7 into tube 6 and mix thoroughly (1:2.5 dilution).
- Serially dilute by transferring 100 µL from each tube to the next lower tube (tube 6 → 5 → 4 → 3 → 2 → 1), mixing thoroughly at each step.
- Tube 0 contains Assay Buffer only and serves as the zero standard.



Note: The concentration of the highest standard solution may vary (refer to the product COA for details).

Procedure

1. **Bead and Sample incubation**

   Add 50 µL of **Premixed Antibody-Conjugated Beads** (vortex ≥ 15 s before use) and 50 µL of sample or standard to each well of a 96-well plate. Cover the plate with a sealing film and incubate on a microplate shaker at room temperature, 600 rpm, protected from light, for 1 hour.

2. **Detection antibody incubation**

   After incubation, place the plate on a magnetic separator for 1 minute and remove the supernatant. Add 100 µL of **Biotinylated Detection Antibodies** to each well, cover the plate, and incubate under same conditions for 1 hour.

   Note: This step can also be accomplished through centrifugation separation steps. Specifically, remove the plate seal. Centrifuge the 96-well plate at 300 ×g for 5 min and remove the supernatant. Add 100 µL of Biotinylated Detection Antibodies to each well, cover the plate, and incubate under same conditions for 1 hour.

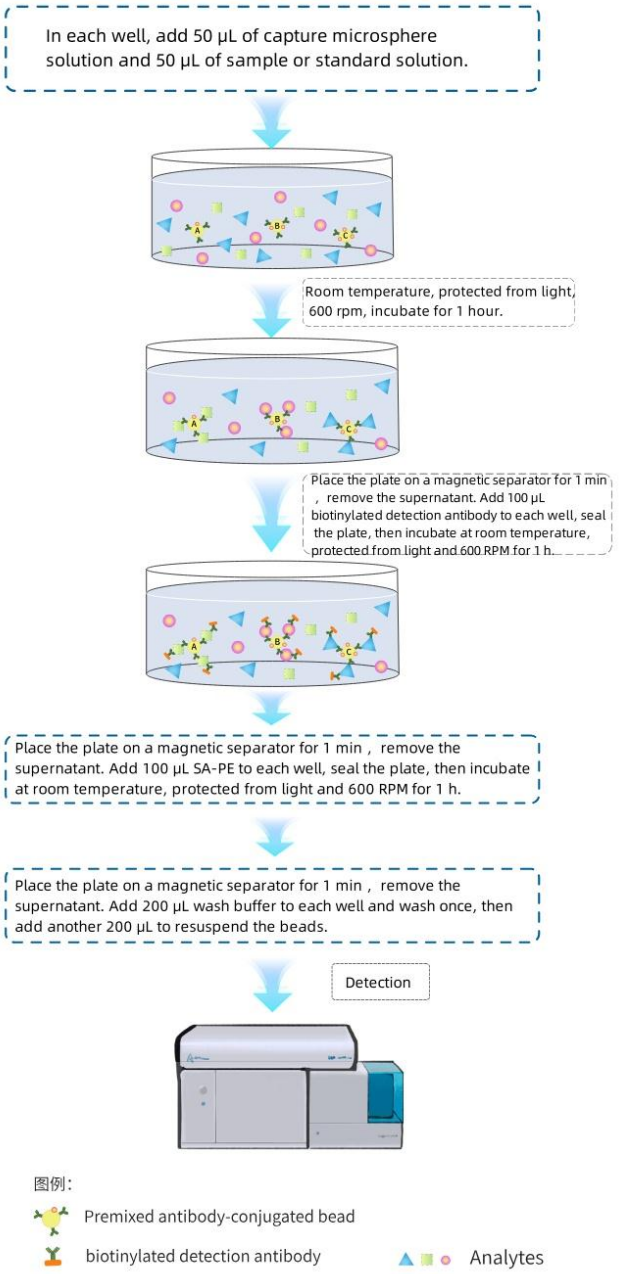
3. **SA-PE incubation and washing**

   After incubation, place the plate on a magnetic separator for 1 minute remove the supernatant, and wash once with 200 µL of **Wash Buffer**. Remove the wash buffer. and add 100 µL of **SA-PE** to each well. Cover the plate with a sealing film and incubate on a shaker at room temperature, 600 RPM, protected from light, for 30 minutes. Following incubation, wash once with 200 µL of Wash Buffer, separating each time.

   Note: The washing procedure can also be accomplished through centrifugation separation steps. Specifically, remove the plate seal. Centrifuge the 96-well plate at 300 × g for 5 min. Remove the wash buffer, and add 100 µL of SA-PE to each well. Cover the plate with a sealing film and incubate on a shaker at room temperature, 600 RPM, protected from light, for 30 minutes. Following incubation, centrifuge the 96-well plate at 300 ×g for 5 min and discard supernatant.

4. **Final resuspension and detection**

   Resuspend the beads in 200 µL of **Wash Buffer** and proceed with detection using the a flow cytometer under appropriate settings.



Flow Cytometry Detection

Sample Test Data Acquisition

1) Acquire samples on a flow cytometer using manual gating analysis.
2) Create an FSC-H/SSC-H scatter plot. Adjust FSC and SSC to identify the cytokine bead population using a rectangular P1 gate (Figure 1).

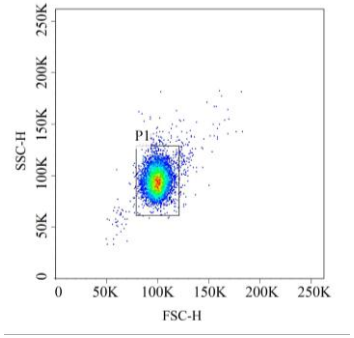


Figure 1

3) Create an APC-H/APC-Cy7-H scatter plot. From the P1-gated bead population, identify individual bead populations according to the relative positions of each encoded bead population specified in the product's Certificate of Analysis (COA) and gate each cytokine-specific bead population using rectangular gates (Figure 2).

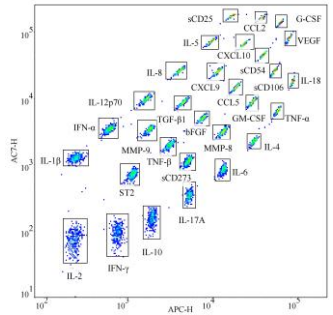


Figure 2

Data Analysis

1) Set data acquisition to collect at least 200 beads per cytokine gate. For example, when analyzing four bead populations, collect a minimum of 800 total beads.
2) Calculate the median fluorescence intensity (MFI) of standard and samples. Subtract the MFI of the blank well to obtain the corrected MFI value.
3) Generate a standard curve by plotting concentration (x-axis) and MFI (y-axis) using a log-log scale, and fit the curve with a four-parameter logistic (4-PL) or five-parameter logistic (5-PL) model.
4) Calculate the concentration of unknown from the calibration curve of each analyte.
5) If the sample MFI exceeds the upper limit of the standard curve, dilute the sample appropriately and repeat the measurement. Multiply the calculated concentration by the corresponding dilution factor.

(Note: If data analysis is required, please contact technical support.)

Performance parameters

1. Detection range：Please refer to the COA of the current batch. Do not use products from different batches together.
2. Limit of Blank (LoB): The LoB for all analytes is ⩽ 8 pg/mL.
3. Recovery: The mean recovery ranges from 70% to 120%.
4. Precision: The intra-assay and inter-assay coefficients of variation (CV) are ⩽ 15%.
5. Specificity:
   No significant cross-reactivity is observed among the analytes included in this kit.

Precautions

1. This product is intended for **research use only** and must be used by qualified professionals. Personnel responsible for data interpretation and reporting should have appropriate technical training.
2. Follow standard laboratory safety practices and reagent handling procedures. This product contains fluorescent dyes. Avoid direct contact with skin and eyes, prevent contamination of food and beverages, and always wear appropriate personal protective equipment, including gloves, during handling.
3. Improper flow cytometer calibration, inadequate fluorescence compensation, or incorrect gating strategies may lead to inaccurate results. Refer to the instrument manufacturer's manual and ensure proper calibration to sample acquisition.
4. Before use, vortex the bead suspension thoroughly to ensure uniform bead dispersion and to prevent bead aggregation, which may affect assay performance.
5. To prevent cross-contamination, change pipette tips between each well, exercise caution when removing the plate sealer to avoid contact with adjacent wells use fresh tips for different standards or samples, and avoid bubble formation during pipetting. Use of a multichannel pipette is recommended for wash steps.
6. Protect all reactions involving detection antibodies and SA-PE from light throughout the assay to maintain fluorescence signal integrity.
7. Do not mix reagents from different lot numbers or substitute reagents from other manufacturers. Use all components according to the instructions provided in this manual and within their stated expiration dates.