

# ABplex Mouse Cytokine 7-Plex Assay Kit

Catalog NO.**RK04780**

For the simultaneous quantitative determination of multiple mouse cytokine concentrations in cell culture supernates,serum,plasma.

This package insert must be read in its entirety before using this product

For research use only. Not for use in diagnostic procedures

## **Introduction**

The kit is a sandwich enzyme immunoassay for in vitro quantitative measurement of CXCL1/KC、G-CSF、IL-1 $\beta$ 、IL-6、TNF- $\alpha$ 、VCAM-1、IFN- $\gamma$  in mouse serum,plasma,cell culture supernatants.

## **Principle of the Assay**

Analyte-specific antibodies are pre-coated onto magnetic beads with fluorophores at set ratios for each unique microparticle region. Coupled beads, standards and samples are pipetted into wells and the immobilized antibodies bind the analytes of interest. After washing away any unbound substances, a biotinylated antibody cocktail specific to the analytes of interest is added to each well. Following a wash to remove any unbound biotinylated antibody, streptavidin-phycoerythrin conjugate (SA-PE), which binds to the biotinylated antibody, is added to each well. Final washes remove unbound Streptavidin-PE, the beads are resuspended in buffer and read using the ABplex-100 Analyzer. A Coupled bead in the analyzer captures and holds the superparamagnetic microparticles in a monolayer. Two spectrally distinct Light Emitting Diodes (LEDs) illuminate the microparticles. One LED excites the dyes inside each microparticle to identify the region and the second LED excites the PE to measure the amount of analyte bound to the microparticle. PE serves as a fluorescent indicator, or reporter. A sample from each well is imaged with a CCD camera with a set of filters to differentiate excitation levels.

## **Material Provided & Storage Conditions**

Store the unopened kit at 2-8°C. Do not use past the kit expiration date.

Part	Description	Size	Cat.No.	Storage of opened/reconstituted material
Coupled magnetic beads	Coupled mouse CXCL1/KC, G-CSF, IL-1 $\beta$ , TNF- $\alpha$ , VCAM-1, IFN- $\gamma$ , IL-6 antibody with magnetic beads.	1x500ul	RM59366	Store in the dark at 2-8°C
Standard Lyophilized	recombinant mouse CXCL1/KC, G-CSF, IL-1 $\beta$ , TNF- $\alpha$ , VCAM-1, IFN- $\gamma$ , IL-6 in a buffered protein base with preservatives;	2vials	RM59365	Aliquot and store at 2-8 °C in a manual defrost freezer. Avoid repeated freeze-thaw cycles.
Concentrated Biotin Conjugate Antibody (100x)	concentrated biotinylated antibody cocktail	1x50ul	RM59367	May be stored for up to 6 month at 2-8 °C.
Streptavidin-PE Concentrated (5x)	concentrated streptavidin-phycoerythrin in conjugate with preservatives.	1x1ml	RM59400	
Standard/Sample Diluent (R1)	a buffered protein base with preservative.	1x20mL	RM59401	
Biotin-Conjugate Antibody Diluent (R2)	a buffered protein base with preservative.	1x12mL	RM59402	
Streptavidin-PE Diluent(R3)	a buffered protein base with preservative.	1x12mL	RM59403	
Wash Buffer(20x)	a buffered protein base with preservative.	1x30mL	RM59404	
Plate Sealers	4 Strips			
Specification	1			
Microplate	1			

## **Other Supplies Required**

ABplex-100 analyzer with X-Y platform

1. Hand-held microplate magnet or platewasher with a magnetic platform
2. Multi-channel pipette, manifold dispenser, or automated dispensing unit
3. Horizontal orbital microplate shaker capable of maintaining a speed of  $1200 \pm 50$  rpm
4. Microcentrifuge
5. Pipettes and pipette tips
6. Deionized or distilled water
7. Polypropylene test tubes for dilution of standards and samples
8. 10 mL and 50 mL graduated cylinders

## **Precautions**

1. Any variation in diluent,operator,pipetting technique,washing technique,incubation time or temperature,and kit age can cause variation in binding.
2. Variations in sample collection,processing,and storage may cause sample value differences.
3. Reagents may be harmful,if ingested,rinse it with an excess amount of tap water.
4. Do not mix or substitute reagents with those from other lots or other sources.
- 5 . Adequate mixing is particularly important for good result.Use a mini-vortexer at the lowest frequency.
6. Mix the sample and all components in the kits adequately,and use clean plastic container to prepare all diluents.
- 7 . Both the sample and standard should be assayed in duplicate,and reagents should be added in sequence in accordance with the requirement of the specification.
8. Reuse of dissolved standard is not recommended.
9. The kit should not be used beyond the expiration date on the kit label.
- 10 . Until all factors have been tested in this assay,the possibility of interference cannot be excluded.

## **Sample Collection & Storage**

The sample collection and storage conditions listed below are intended as general guidelines. Sample stability has not been evaluated.

Cell Culture Supernatant: Remove particulates by centrifugation. Assay immediately or aliquot and store samples at  $\leq -20^{\circ}\text{C}$ . Avoid repeated freeze-thaw cycles.

Serum: Use a serum separator tube (SST) and allow samples to clot for 30 minutes at room temperature before centrifugation for 15 minutes at  $1000 \times g$ . Remove serum and assay immediately or aliquot and store samples at  $\leq -20^{\circ}\text{C}$ . Avoid repeated freeze-thaw cycles.

Plasma: Collect plasma using EDTA or Heparin as an anticoagulant. Centrifuge for 15 minutes at  $1000 \times g$  within 30 minutes of collection. Assay immediately or aliquot and store samples at  $\leq -20^{\circ}\text{C}$ . Avoid repeated freeze-thaw cycles. (Note: Citrate plasma has not been validated for use in this assay.)

**Note:** Avoid hemolytic and hyperlipidemia sample for serum and plasma.

## **Reagent Preparation**

Bring all reagents to room temperature before use. If crystals have formed in the concentrate, bring the reagent to room temperature and mix gently until the crystals have completely dissolved.

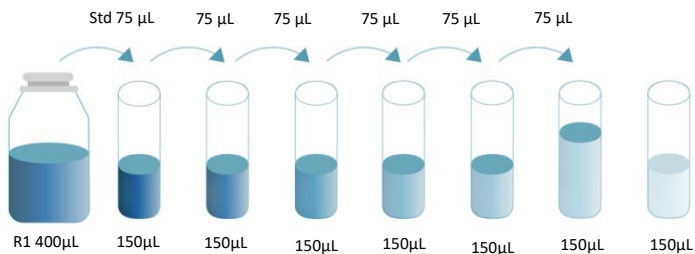
**Working Biotin Conjugate Antibody**-Dilute 1:100 of Concentrated Biotin Conjugate Antibody (100x) with Biotin-Conjugate Antibody Diluent (R2) before use, for example: Add 20  $\mu$ L of Concentrated Biotin Conjugate Antibody (100x) to 1980  $\mu$ L Biotin-Conjugate Antibody Diluent (R2) to prepare 2000  $\mu$ L Working Biotin Conjugate Antibody Buffer.

**Working Streptavidin-PE**-Dilute 1:5 of Concentrated Streptavidin-PE (5x) with Streptavidin-PE Diluent (R3) before use, for example: Add 200  $\mu$ L of Concentrated Streptavidin-PE (5x) to 800  $\mu$ L Streptavidin-PE Diluent (R3) to prepare 1000  $\mu$ L Working Streptavidin-PE Buffer.

**Wash Buffer**-If crystals have formed in the concentrate, warm to room temperature and mix gently until the crystals have completely dissolved. Dilute 1:20 with double distilled or deionized water before use.

**Standard**-Reconstitute the Standard Lyophilized with Standard/Sample Diluent (R1). For the redissolution volume, see the label of the corresponding calibrator bottle. Allow the standard to sit for a minimum of 20 minutes prior to making dilutions. Prepare the tube containing R1 diluent according to the figure below, and perform gradient dilution according to the prompts.





## **Sample Preparation**

**Note** During the whole procedure, it is recommended that a face mask and gloves be used to protect kit reagents from contamination.

**Sample** Different types of sample need appropriate dilutions.

**Cell culture supernate** samples require a appropriate dilution with Standard/Sample Diluent (R1).

**Serum (pretreated) and plasma** samples require a appropriate dilution with Standard/Sample Diluent (R1).

## **Assay Procedure**

Bring all reagents and samples to room temperature before use. It is recommended that all standards, controls, and samples be assayed in duplicate.

1. Prepare all reagents, working standards, and samples as directed in the previous sections.
2. Add 50  $\mu\text{L}$  of standard or sample per well.
3. Resuspend the Coupled magnetic beads by inversion or vortexing. Add 5  $\mu\text{L}$  of the microparticle cocktail to each well of the microplate. Securely cover with a foil plate sealer. Incubate for 1 hour at 37°C on a horizontal orbital microplate shaker (0.12" orbit) set at 1200 $\pm$ 50 rpm.
4. Using a magnetic device designed to accommodate a microplate, wash by applying the magnet to the bottom of the microplate, allow 2min before removing the liquid, filling each well with Wash Buffer (100  $\mu\text{L}$ ) and allow 2min before removing the liquid again. Uniform removal of liquid is essential for good performance. Note: Do NOT blot; this may cause a loss of microparticles.
5. Add 50  $\mu\text{L}$  of Working Detection antibodies to all wells. Securely cover with a foil plate sealer and incubate for 30min at 37°C on the shaker set at 1200 $\pm$ 50 rpm.
6. Repeat the wash as in step 4.
7. Add 50  $\mu\text{L}$  of Working Streptavidin-PE to all wells. Securely cover with a foil plate sealer and incubate for 15 minutes at 37°C on the shaker set at 1200 $\pm$ 50 rpm.
8. Repeat the wash as in step 4.
9. Resuspend the microparticles by adding 60  $\mu\text{L}$  of Wash Buffer to each well. Incubate for 2 minutes on the shaker set at 1200 $\pm$ 50 rpm.
10. Read within 90 minutes using the ABplex-100 analyzer.  
Note: Resuspend microparticles immediately prior to reading by shaking the plate for 2 minutes on the plate shaker set at 1200 $\pm$ 50 rpm.

## **Assay Procedure Summary**

Prepare the standard and reagents



Add 50 $\mu$ L of standards or test samples to each well



Add 5 $\mu$ L coded microspheres to each well

Incubate for 1 hour at 37 $^{\circ}$ C, then wash 1 times



Add 50 $\mu$ L Working detection antibody

Incubate for 0.5 hour at 37 $^{\circ}$ C, then wash 1 times



Add 50 $\mu$ L SA-PE

Incubate for 15min at 37 $^{\circ}$ C under dark condition



Add 55 $\mu$ L wash buffer



Detect with the ABplex-100

## **Calculation of Results**

1. Use the Standard concentrations on the Standard Value Card and calculate 3-fold dilutions for the remaining levels. Average the duplicate readings for each standard and sample and subtract the average blank Median Fluorescence Intensity (MFI).

2. Create a standard curve for each analyte by reducing the data using computer software capable of generating a four parameter logistic (4-PL) curve-fit.

Since samples have been diluted, the concentration read from the standard curve must be multiplied by the dilution factor.

## **Sensitivity**

LOB-The concentration of analyte for calculating two concentration of the mean the fluorescence intensity signal of twenty zero standard replicates and three next standard.

Analyte	Sensitivity (LOB)	Analyte	Sensitivity (LOB)
CXCL1/KC	0.75 pg/ml	TNF- $\alpha$	2.04 pg/ml
G-CSF	1.09 pg/ml	VCAM-1	19.82 pg/ml
IL-1 $\beta$	0.84 pg/ml	IFN- $\gamma$	3.78 pg/ml
IL-6	0.61 pg/ml		

## **Specificity**

This assay recognizes both recombinant and natural Mouse Cathepsin B. The factors listed below were prepared at and assayed for cross-reactivity. No significant cross-reactivity was observed with the following:

IL-2	IL-9	M-CSF
IL-4	IFN- $\alpha$	VEGF
IL-5	GM-CSF	ICAM-1
IL-7	IL-1 $\alpha$	MIP-1 $\alpha$

## **Precision**

**Inter-Assay Precision**-generated from the mean of the %CV's across two different concentrations of analytes across 25

different serum assays.

Analyte	Inter-Assay (%CV)
CXCL1/KC	4.12
G-CSF	2.67
IL-1 $\beta$	2.47
IL-6	3.15
TNF- $\alpha$	3.27
VCAM-1	2.99
IFN- $\gamma$	3.12

## **Recovery**

The data represents mean percent recovery of spiked standards ranging from low, medium, and high concentration in serum matrix samples.

Analyte	n	Recovery Average %
CXCL1/KC	4	89.52
G-CSF	4	91.27
IL-1 $\beta$	4	104.11
IL-6	4	102.35
TNF- $\alpha$	4	97.34
VCAM-1	4	110.24
IFN- $\gamma$	4	86.32

**Detection Range**

Analyte	Bead	Concentration of Standard 1 (pg/mL)
CXCL1/KC	16	10000pg/ml
G-CSF	22	10000pg/ml
IL-1 $\beta$	3	2000pg/ml
IL-6	11	5000pg/ml
TNF- $\alpha$	14	5000pg/ml
VCAM-1	44	100000pg/ml
IFN- $\gamma$	13	5000pg/ml