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## **Quick Step Rat Granulocyte-Macrophage Colony Stimulating Factor,GM-CSF ELISA Kit**

**Size:** 96 T, 48T

**Catalogue Number:**QS0323Ra

**Assay Time:** 60 minutes

**Store all reagents at 2-8°C/-20°C**

**Validity Period:** 2-8°C for six months, -20°C for one year. Avoid repeated thaw cycles.

**For samples:**In serum, plasma, culture media or any biological fluid.

**FOR RESEARCH USE ONLY !**

**NOT FOR THERAPEUTIC OR DIAGNOSTIC APPLICATIONS !**

**PLEASE READ THROUGH ENTIRE PROCEDURE BEFORE BEGINNING !**

# Quick Step Rat Granulocyte-Macrophage Colony Stimulating Factor,GM-CSF ELISA Kit

**FOR RESEARCH USE ONLY**

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## Purpose

Our Quick Step Rat Granulocyte-Macrophage Colony Stimulating Factor,GM-CSF ELISA Kit is to assay GM-CSF levels in Rat serum, plasma, culture media or any biological fluid.

## Principle

This ELISA kit uses Sandwich-ELISA as the method. The Microelisa stripplate provided in this kit has been pre-coated with an antibody specific to GM-CSF. Standards or samples are added to the appropriate Microelisa stripplate wells and combined to the specific antibody. Then a Horseradish Peroxidase (HRP)- conjugated antibody specific for GM-CSF is added to each Microelisa stripplate well and incubated. Free components are washed away. The TMB substrate solution is added to each well. Only those wells that contain GM-CSF and HRP conjugated GM-CSF antibody will appear blue in color and then turn yellow after the addition of the stop solution. The optical density (OD) is measured spectrophotometrically at a wavelength of 450 nm. The OD value is proportional to the concentration of GM-CSF. You can calculate the concentration of GM-CSF in the samples by comparing the OD of the samples to the standard curve.

## Materials provided with the kit

	Materials provided with the kit	96 determinations	48 determinations
1	User manual	1	1
2	Closure plate membrane	2	2
3	Sealed bags	1	1
4	Microelisa stripplate	1	1
5	Standard:135.0pg/ml	0.5ml×1 bottle	0.5ml×1 bottle
6	Standard diluent	1.5ml×1 bottle	1.5ml×1 bottle

7	HRP-Conjugate reagent	6ml×1 bottle	3ml×1 bottle
8	Sample diluent	6ml×1 bottle	3ml×1 bottle
9	Chromogen Solution A	6ml×1 bottle	3ml×1 bottle
10	Chromogen Solution B	6ml×1 bottle	3ml×1 bottle
11	Stop Solution	6ml×1 bottle	3ml×1 bottle
12	wash solution	20ml (30X)×1bottle	20ml (20X)×1bottle

## Sample preparation

### 1. Serum preparation

After collection of the whole blood, allow the blood to clot by leaving it undisturbed at room temperature. This usually takes 10-20 minutes. Remove the clot by centrifuging at 2,000-3,000 rpm for 20 minutes. If precipitates appear during reservation, the sample should be centrifugated again.

### 2. Plasma preparation

Collect the whole blood into tubes with anticoagulant (EDTA or citrate). After incubated at room temperature for 10-20 minutes, tubes are centrifugated for 20 min at 2,000-3,000 rpm. Collect the supernatant carefully as plasma samples. If precipitates appear during reservation, the sample should be centrifugated again.

### 3. Urine samples

Collect urine into aseptic tubes. Collect the supernatant carefully after centrifuging for 20 min at 2,000-3,000 rpm. If precipitates appear during reservation, the sample should be centrifugated again. The preparation procedure of cerebrospinal fluid and pleuroperitoneal fluid is the same as that of urine sample.

### 4. Cell samples

If you want to detect the secretions of cells, collect culture supernatant into aseptic tubes. Collect the supernatant carefully after centrifuging for 20 min at 2,000-3,000 rpm. If you want to detect intracellular components, dilute the cells to 1X10<sup>6</sup>/ml with PBS (pH 7.2-7.4). The cells were destroyed to release intracellular components by repeated freezing and thawing. Collect the supernatant carefully after centrifuging for 20 min at 2,000-3,000 rpm. If precipitates appear during reservation, the sample should be centrifugated again.

### 5. Tissue samples

Tissue samples are cut, weighed, frozen in liquid nitrogen and stored at  $-80^{\circ}\text{C}$  for future use. The tissue samples were homogenized after adding PBS (pH 7.4). Samples should be operated at  $4^{\circ}\text{C}$ . Collect the supernatant carefully after centrifuging for 20 min at 2,000-3,000 rpm. Aliquot the supernatant for ELISA assay and future use.

### Notes:

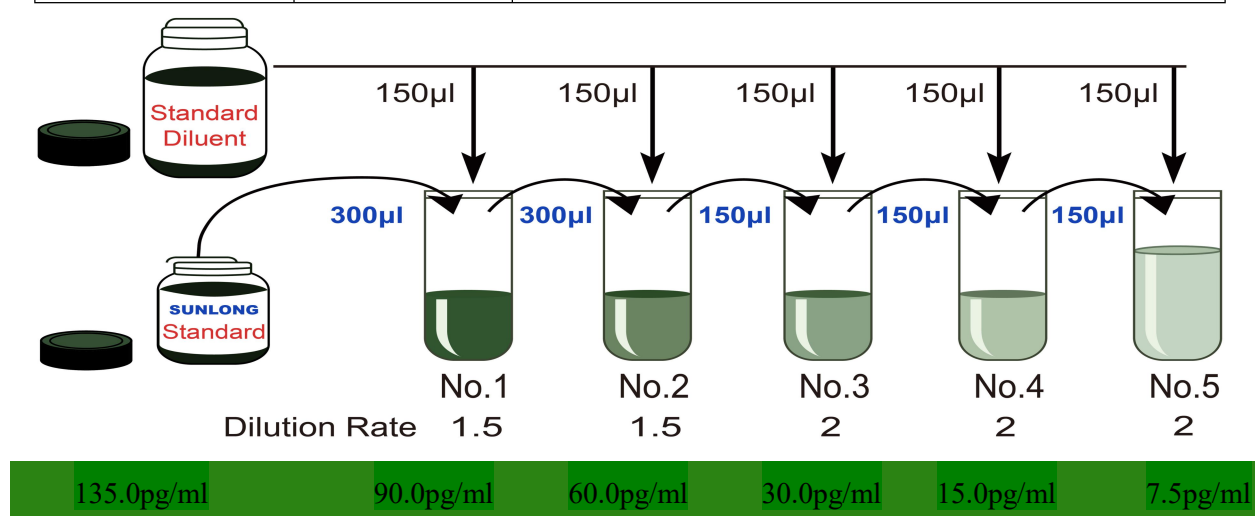
1. Sample extraction and ELISA assay should be performed as soon as possible after sample collection. The samples should be extracted according to the relevant literature. If ELISA assay can not be performed immediately, samples can be stored at  $-20^{\circ}\text{C}$ . Repeated freeze-thaw cycles should be avoided.
2. Our kits can not be used for samples with  $\text{NaN}_3$  which can inhibit the activity of HRP.

“The sample cannot be diluted with this kit. Due to the material preparation kit we use, sample matrix interference may falsely reduce the specificity and accuracy of the detection.”

### Procedure

1. **Dilution of Standards:** Dilute the standard by small tubes first, then pipette the volume of 50ul from each tube to microplate well, each tube use two wells, total ten wells.

90.0pg/ml	Standard No.1	300μl Original Standard + 150μl Standard diluents
60.0pg/ml	Standard No.2	300μl Standard No.1 + 150μl Standard diluents
30.0pg/ml	Standard No.3	150μl Standard No.2 + 150μl Standard diluent
15.0pg/ml	Standard No.4	150μl Standard No.3 + 150μl Standard diluent
7.5pg/ml	Standard No.5	150μl Standard No.4 + 150μl Standard diluent



2. **Add sample:** Set blank wells separately (blank comparison wells don't add sample and HRP-Conjugate reagent, other each step operation is same). testing sample well. add Sample

dilution 40µl to testing sample well, then add testing sample 10µl (sample final dilution is 5-fold), add sample to wells, don't touch the well wall as far as possible, and Gently mix.

- 3. Add enzyme:** Add HRP-Conjugate reagent 50µl to each well, except blank well.
- 4. Incubate:** After closing plate with Closure plate membrane ,incubate for **30 min** at 37°C.
- 5. Configure liquid:** 30-fold (or 20-fold)wash solution diluted 30-fold (or 20-fold) with distilled water and reserve.
- 6. Washing:** Uncover Closure plate membrane, discard Liquid, dry by swing, add washing buffer (350µl to 400µl, or fill it completely, overflow is acceptable) to each well, still for 30s then drain, repeat 5 times, dry by pat.
- 7. Color:** Add Chromogen Solution A 50µl and Chromogen Solution B 50µl to each well, evade the light preservation for **10 min** at 37°C
- 8. Stop the reaction:** Add Stop Solution 50µl to each well, Stop the reaction(the blue color change to yellow color).
- 9. Assay:** take blank well as zero, Read absorbance at 450nm after Adding Stop Solution and within **15min**.

## Summary:



## Notes:

1. Store the kit at 2-8 °C /-20 ° C upon receipt.The kit should be equilibrated to room temperature before the assay. Remove any unneeded strips from Rat GM-CSF antibody-Coated plate, reseal them in zip-lock foil and keep at 2-8°C/-20°C.
2. Precipitates may appear in concentrated washing buffer. Please heat the buffer to dissolve all the precipitates, which will not affect the results.
3. Accurate pipette should be used to avoid experimental error. Samples should be added to the Microplate in less than 5 minutes. If a large number of samples are included, multiple

channel pipette is recommended.

4. Standard curve should be included in every assay. Replicate wells are recommended. If the OD value of the sample is greater than the first well of standards, please dilute the sample (n times) before test. When calculating the original GM-CSF concentration, please multiply the total dilution factor (XnX5).
5. In order to avoid cross-contamination, Microplate sealers are for one-time use only.
6. Please keep Substrate away from light.
7. All the operation should be accordance with the manufacturer's instructions strictly. The results determined by the Microtiter Plate Reader.
8. All the samples, washing buffer and wastes should be treated as infectious agents.
9. Reagents from different lots should not be mixed.

## **Precision**

Intra-assay Precision (Precision within an assay): 3 samples with low, middle and high level Rat GM-CSF were tested 20 times on one plate, respectively.

Inter-assay Precision (Precision between assays): 3 samples with low, middle and high level Rat GM-CSF were tested on 3 different plates, 8 replicates in each plate.

$$CV(\%) = SD/\text{mean} \times 100$$

Intra-Assay:  $CV < 10\%$

Inter-Assay:  $CV < 12\%$

## **Assay range**

1.5pg/ml-100pg/ml

## **Sensitivity**

0.5pg/ml

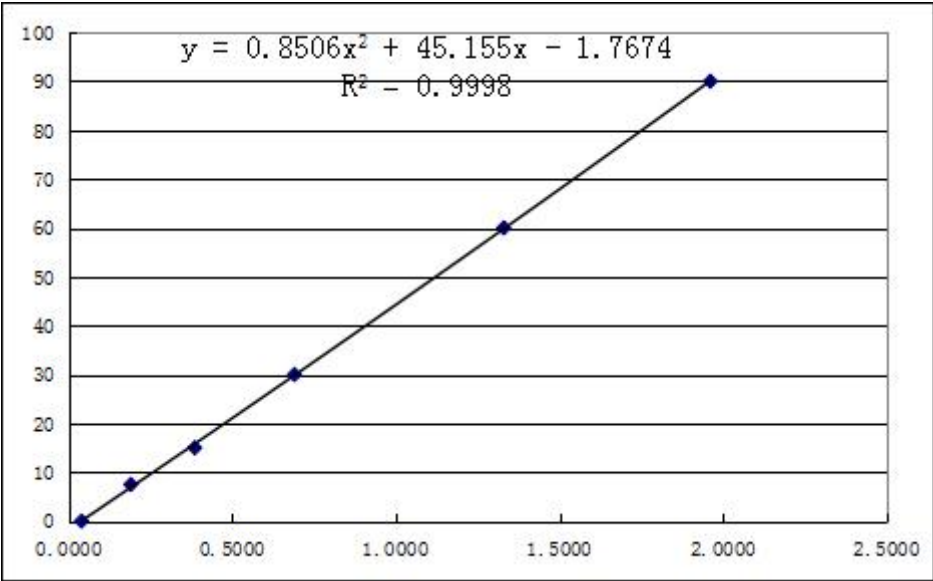
## **Calculation of Results**

Known concentrations of Rat GM-CSF Standard and its corresponding reading OD is plotted on the log scale (x-axis) and the log scale (y-axis) respectively. The concentration of Rat GM-CSF in sample is determined by plotting the sample's O.D. on the Y-axis. The original concentration is calculated by multiplying the dilution factor.

**Equation:** Polynomial Quadratic Regression

**Typical Data**

The standard curve of QS0323Ra is provided for demonstration only. A standard curve should be generated for each set of samples assayed.



Standard	Concentration	OD Value	Average OD Value
Blank Well	0pg/ml	0.043	0.0405
		0.038	
S1	90pg/ml	1.954	1.9615
		1.969	
S2	60pg/ml	1.318	1.3305
		1.343	
S3	30pg/ml	0.683	0.6910
		0.699	
S4	15pg/ml	0.391	0.3865
		0.382	
S5	7.5pg/ml	0.194	0.1910
		0.188	

## Troubleshooting

<b>Weak Signal</b>	<b>Solution</b>
Improper washing	Increasing duration of soaking steps
Incorrect incubation temperature	Incubate at room temperature
antibody are not enough	Increase the concentration of the antibody
Reagent are contaminated	Use new one
Pipette are not clean	Pipette should be clean
<b>No Signal</b>	<b>Solution</b>
Reagent are contaminated	Use new one
Sample prepared incorrectly	Make sure the sample workable/dilution
antibody are not enough	Increase the antibody concentration
Wash buffer contains sodium azide	Use a new wash buffer and avoid sodium azide in it
HRP was not added	Add HRP according to the instruction
<b>Poor Precision</b>	<b>Solution</b>
Imprecise/ inaccurate pipetting	Check/ calibrate pipettes
Incomplete washing of the wells	Make sure wells are washed adequately by filling the wells with wash buffer and all residual antibody solutions crossed well before washing.