



Human GM-CSF ELISA Kit

Enzyme Immunoassay for the quantification of Human GM-CSF in serum, plasma, cell culture supernatants

Catalog number: ARG83351

Package: 96 wells

For research use only. Not for use in diagnostic procedures.

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INTRODUCTION

The protein encoded by this gene is a cytokine that controls the production, differentiation, and function of granulocytes and macrophages. The active form of the protein is found extracellularly as a homodimer. This gene has been localized to a cluster of related genes at chromosome region 5q31, which is known to be associated with interstitial deletions in the 5q- syndrome and acute myelogenous leukemia. Other genes in the cluster include those encoding interleukins 4, 5, and 13. [provided by RefSeq, Jul 2008]

PRINCIPLE OF THE ASSAY

This assay employs the quantitative sandwich enzyme immunoassay technique. An antibody specific for GM-CSF has been pre-coated onto a microtiter plate. Standards or samples are pipetted into the wells and any GM-CSF present is bound by the immobilized antibody. After washing away any unbound substances, a biotin-conjugated antibody specific for GM-CSF is added to each well and incubate. Following a washing to remove unbound substances, streptavidin conjugated to Horseradish Peroxidase (HRP) is added to each microplate well and incubated. After washing away any unbound antibody-enzyme reagent, a substrate solution (TMB) is added to the wells and color develops in proportion to the amount of GM-CSF bound in the initial step. The color development is stopped by the addition of acid and the intensity of the color is measured at a wavelength of 450nm. The concentration of GM-CSF in the sample is then determined by comparing the O.D of samples to the standard curve.

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MATERIALS PROVIDED & STORAGE INFORMATION

Use the kit before expiration date. Opened kits retain activity for 8 weeks if stored as described above.

Component	Quantity	Storage information
Antibody Coated Microplate	8 X 12 strips	4°C
Standard (Lyophilized)	3 vials	4°C
100X Antibody Conjugate Concentrate	120 µL	≤ -20°C
1000X HRP-Streptavidin Solution	15 µL	4°C
Standard/Sample Diluent Buffer	20 mL (ready to use)	4°C
Antibody Diluent buffer	35 mL (ready to use)	4°C
10X Wash Buffer	50 mL	4°C
TMB substrate	12 mL (ready to use)	4°C (protect from light)
STOP solution	12 mL (ready to use)	4°C
Plate sealer	4 adhesive strips	RT

MATERIALS REQUIRED BUT NOT PROVIDED

- Microplate reader capable of reading at 450 nm
- Deionized or distilled water
- Pipettes and pipette tips
- Multichannel micropipette reservoir
- Microtiter plate washer (optional)

TECHNICAL NOTES AND PRECAUTIONS

- Wear protective gloves, clothing, eye, and face protection especially while handling blood or body fluid samples.
- Upon received, store 100X Antibody Conjugate concentrate at $\leq -20^{\circ}\text{C}$. Store other component at $2-8^{\circ}\text{C}$ at all times.
- Prior to beginning the assay procedure, bring all reagents and required number of strips to room temperature ($20-25^{\circ}\text{C}$).
- Avoid air bubbles in the wells as this could result in lower binding efficiency and higher CV% of duplicate reading.
- Briefly spin down the all vials before use.
- If crystals are observed in the 10X Wash Buffer, warm to 37°C until the crystals are completely dissolved.
- Minimize lag time between wash steps to ensure the plate does not become completely dry during the assay.
- Ensure complete reconstitution and dilution of reagents prior to use.
- Take care not to contaminate the TMB Substrate. Do not expose the TMB solution to glass, foil or metal. Do NOT return leftover TMB Substrate to bottle. Do NOT contaminate the unused TMB Substrate. If the solution is blue before use, DO NOT USE IT.
- Change pipette tips between the addition of different reagent or samples.
- Taping the well strips together with lab tape can be done as an extra precaution to avoid plate strips from coming loose during the procedure.
- Include a standard curve each time the assay is performed.
- Run both standards and samples in at least duplicates.

SAMPLE COLLECTION & STORAGE INFORMATION

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

Cell Culture Supernatants - Remove particulates by centrifugation for 10 min at 1500 x g at 4°C and aliquot & store samples at -20°C up to 1 month or -80°C up to 6 months. Avoid repeated freeze-thaw cycles.

Serum - Use a serum separator tube (SST) and allow samples to clot for 30 minutes before centrifugation for 15 minutes at 1000 x g. Collect serum and assay immediately or aliquot & store samples at -20°C up to 1 month or -80°C up to 6 months. Avoid repeated freeze-thaw cycles.

Plasma - Collect plasma using EDTA or heparin as an anticoagulant. Centrifuge for 15 minutes at 1000 x g. within 30 minutes of collection. Collect the supernatants and assay immediately or aliquot and store samples at -20°C up to 1 month or -80°C up to 6 months. Avoid repeated freeze-thaw cycles.

Note:

1. Do not use haemolytic, icteric or lipaemic specimens.
2. Samples containing sodium azide should not be used in the assay.

REAGENT PREPARATION

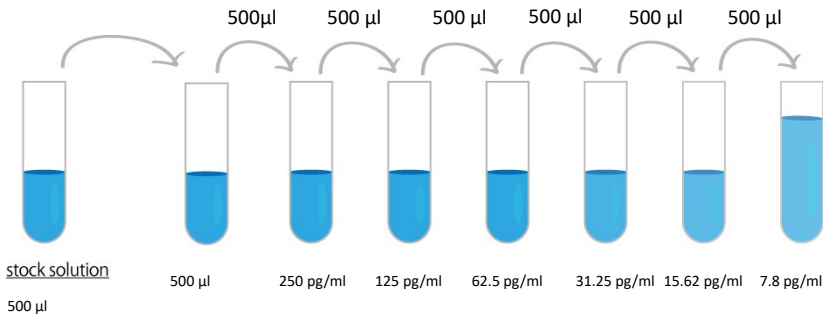
- **1X Wash Buffer:** Dilute **10X** Wash Buffer into **distilled water** to yield 1X Wash Buffer. (E.g., add 50 mL of 10X Wash Buffer into 450 mL of distilled water to a final volume of 500 mL)
The 1X Wash Buffer is stable for up to 4 weeks at 2-8°C. Mix well before use.
- **1X Antibody Conjugate:** 20 minutes before use, dilute **100X** Antibody Conjugate concentrate into **Antibody Diluent buffer** to yield **1X** Antibody Conjugate.
- **1X HRP-Streptavidin Solution:** 20 minutes before use, dilute **1000X** HRP-Streptavidin Solution into **Antibody Diluent buffer** to yield **1X** HRP-Streptavidin Solution. Keep diluted HRP-Streptavidin Solution in dark before use.
- **Sample:** Diluent serum and plasma samples with equal volume of **Standard/Sample Diluent Buffer** before assay (1:1, dilution factor=2). If the initial assay found samples contain proteins higher than the highest standard, the samples can be diluted with Standard/Sample Diluent Buffer and then re-assay the samples. For the calculation of the concentrations this dilution factor has to be taken into account. Cell culture supernatants could be assayed directly. (It is recommended to do pre-test to determine the suitable dilution factor).
- **Standard:** Centrifuge the un-reconstituted standard at 6000 x g for 1 minute to bring down the material prior to open the vial. Add **1 ml** of **Standard/Sample Diluent Buffer** to a Standard vial to make the high standard concentration of 500 pg/mL and brief vortex for few seconds (Do

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not induce foaming) and allow it to sit for 15 minutes. Make sure the standard is dissolved completely before making serial dilutions. The Standard/Sample Diluent Buffer serves as zero standard (0 pg/ml), and the rest of the standard serial dilution can be diluted with Standard/Sample Diluent Buffer. Diluted the standard as below:

Standard tube	GM-CSF (pg/mL)	Standard/Sample Diluent Buffer (μ L)	Standard (μ L)
S1	500	0	1000 (500 pg/mL Standard Stock)
S2	250	500	500 of S1
S3	125	500	500 of S2
S4	62.5	500	500 of S3
S5	31.3	500	500 of S4
S6	15.6	500	500 of S5
S7	7.8	500	500 of S6
S0	0	500	0

Note: Working standard should be prepared immediately prior to use.



ASSAY PROCEDURE

All materials should be equilibrated to room temperature (RT, 20-25°C) before use. Standards and samples should be assayed in duplicates.

1. Add **100 µL** of **diluted samples** or each **diluted Standard** into respective wells of the 96-well plate.
2. Cover the plate and incubate for **2 hour** at **room temperature**.
3. Aspirate each well and wash, repeating the process 4 time for a total 5 washes. Wash by filling each well with **1X Wash Buffer (300 µL)** using a squirt bottle, manifold dispenser, or autowasher. Complete removal of liquid at each is essential to good performance. After the last wash, remove any remaining Wash Buffer by aspirating, decanting or blotting against clean paper towels.
4. Add **100 µL** of **1X Antibody Conjugate** to each well.
5. Cover the plate and incubate for **1 hour** at **room temperature**.
6. Aspirate each well and **wash plate as step 3**.
7. Add **100 µL** of **1X HRP-Streptavidin Solution** to each well.
8. Cover the plate and incubate for **1 hour** at **room temperature** in the dark.
9. Aspirate each well and **wash plate as step 3**.
10. Add **100 µL** of **TMB Substrate** in each well.
11. Incubate for **15-20 mins** at **room temperature** in the dark.
12. Add **100 µL** of **Stop Solution** to each well to stop the reaction.
13. Read the absorbance with a plate reader at **O.D. 450 nm**. It is recommended reading the absorbance within 30 minutes after adding the stop solution.

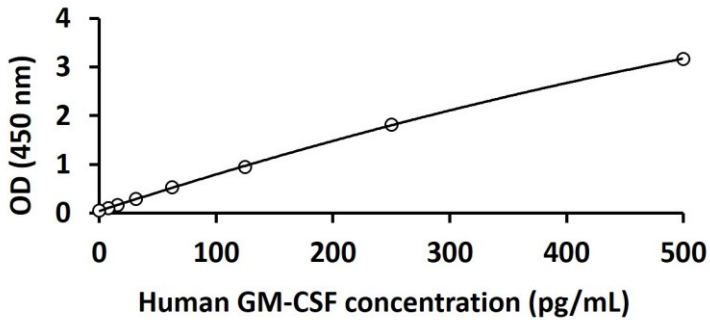
CALCULATION OF RESULTS

1. Calculate the average absorbance values for each set of standards and samples.
2. Using linear graph paper, construct a standard curve by plotting the mean absorbance obtained from each standard against its concentration with absorbance value on the vertical (Y) axis and concentration on the horizontal (X) axis.
3. Using the mean absorbance value for each sample determine the corresponding concentration from the standard curve.
4. Automated method: The results in the IFU have been calculated automatically using a 4 PL (4 Parameter Logistics) curve fit. 4 Parameter Logistics is the preferred method. Other data reduction functions may give slightly different results.
5. arigo provides GainData®, an in-house development ELISA data calculator, for ELISA data result analysis. Please refer our GainData® website for details. (<https://www.arigobio.com/elisa-analysis>)
6. If the samples have been diluted, the concentration read from the standard curve must be further converted by the appropriate dilution factor according to the sample preparation procedure.

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EXAMPLE OF TYPICAL STANDARD VALUES

The following figures demonstrate typical results with the Human GM-CSF ELISA Kit. One should use the data below for demonstration only and cannot be used in place of data generations at the time of assay.



QUALITY ASSURANCE

Sensitivity

3.9 pg/ml

Assay Range

7.8- 500 pg/ml