GDF15 (Human) ELISA Kit

Catalog Number KA1871

96 assays

Version: 02

Intended for research use only

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Introduction

Background

The GDF15 (Human) ELISA Kit is an in vitro enzyme-linked immunosorbent assay for the quantitative measurement of human GDF-15 in serum, plasma, cell culture supernatants and urine. This assay employs an antibody specific for human GDF-15 coated on a 96-well plate. Standards and samples are pipetted into the wells and GDF-15 present in a sample is bound to the wells by the immobilized antibody. The wells are washed and biotinylated anti-human GDF-15 antibody is added. After washing away unbound biotinylated antibody, HRP-conjugated streptavidin is pipetted to the wells. The wells are again washed, a TMB substrate solution is added to the wells and color develops in proportion to the amount of GDF-15 bound. The Stop Solution changes the color from blue to yellow, and the intensity of the color is measured at 450 nm.

General Information

Materials Supplied

Component	Amount
GDF-15 Microplate (Item A): 96 wells (12 strips x 8 wells) coated with anti-human GDF-15	96 wells (12 strips x 8 wells)
Wash Buffer Concentrate (20x) (Item B)	25 ml
Standard recombinant human GDF-15 (Item C)	2 vials
Assay Diluent (Item E): 5x concentrated buffer. For Standard/Sample (serum/plasma/cell culture medium/urine) diluent.	15 ml
Detection Antibody GDF-15 (Item F): biotinylated anti-human GDF-15 (each vial is enough to assay half microplate).	2 vials
HRP-Streptavidin concentrates (Item G): 500x concentrated HRP-conjugated Streptavidin.	200 µl
TMB One-Step Substrate Reagent (Item H): of 3, 3', 5, 5'-tetramethylbenzidine (TMB) in buffered solution	12 ml
Stop Solution (Item I): 0.2 M sulfuric acid	8 ml

Storage Instruction

May be stored for up to 6 months at 2 to 8℃ from the date of shipment. Standard (recombinant protein) should be stored at -20℃ or -80℃ (recommended at -80℃) after reconstitution. Opened Microplate Wells or reagents may be store for up to 1 month at 2 to 8℃. Return unused wells to the pouch containing desiccant pack, reseal along entire edge. *Note: the kit can be used within one year if the whole kit is stored at -20℃. Avoid repeated freeze-thaw cycles.*

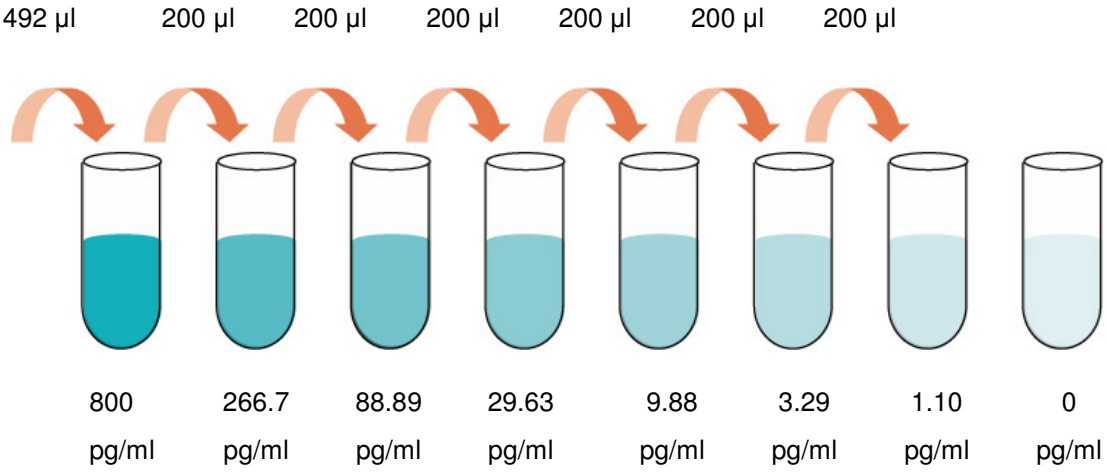
Materials Required but Not Supplied

- ✓ Microplate reader capable of measuring absorbance at 450 nm.
- ✓ Precision pipettes to deliver 2 µl to 1 ml volumes.
- ✓ Adjustable 1-25 ml pipettes for reagent preparation.
- ✓ 100 ml and 1 liter graduated cylinders.
- ✓ Absorbent paper.
- ✓ Distilled or deionized water.
- ✓ Log-log graph paper or computer and software for ELISA data analysis.
- ✓ Tubes to prepare standard or sample dilutions.

Assay Protocol

Reagent Preparation

- Bring all reagents and samples to room temperature (18 - 25℃) before use.
- Sample dilution: If your samples need to be diluted, Assay Diluent (Item E) is used for dilution of serum/plasma/culture supernatants/urine.
  Suggested dilution for normal serum/plasma: 3-30 fold*.
  *Please note that levels of the target protein may vary between different specimens. Optimal dilution factors for each sample must be determined by the investigator.
- Assay Diluent (Item E) should be diluted 5-fold with deionized or distilled water before use.
- Preparation of standard: Briefly spin the vial of Item C. Add 400 µl 1x Assay Diluent (Item E) into Item C vial to prepare a 50 ng/ml standard solution. Dissolve the powder thoroughly by a gentle mix. Add 8 µl GDF-15 standard from the vial of tem C, into a tube with 492 µl 1x Assay Diluent to prepare a 800 pg/ml standard solution. Pipette 400µl 1x Assay Diluent into each tube. Use the 800 pg/ml standard solution to produce a dilution series (shown below). Mix each tube thoroughly before the next transfer. Gently vortex to mix. 1x Assay Diluent serves as the zero standards (0 pg/ml).



- If the Wash Concentrate (20x) (Item B) contains visible crystals, warm to room temperature and mix gently until dissolved. Dilute 20 ml of Wash Buffer Concentrate into deionized or distilled water to yield 400 ml of 1x Wash Buffer.
- Briefly spin the Detection Antibody vial (Item F) before use. Add 100 µl of 1x Assay Diluent into the vial to prepare a detection antibody concentrate. Pipette up and down to mix gently (the concentrate can be stored at 4℃ for 5 days). The detection antibody concentrate should be diluted 80-fold with 1x Assay Diluent and used in step 4 of Assay Procedure.
- Briefly spin the HRP-Streptavidin concentrate vial (Item G) and pipette up and down to mix gently before

use. HRP-Streptavidin concentrate should be diluted 500-fold with 1x Assay Diluent.

For example: Briefly spin the vial (Item G) and pipette up and down to mix gently. Add 20 µl of HRP-Streptavidin concentrate into a tube with 10 ml 1x Assay Diluent to prepare a 500 fold diluted HRP-Streptavidin solution (don't store the diluted solution for next day use). Mix well.

Assay Procedure

1. Bring all reagents and samples to room temperature (18 - 25℃) before use. It is recommended that all standards and samples be run at least in duplicate.
2. Add 100 µl of each standard and sample into appropriate wells. Cover well and incubate for 2.5 hours at room temperature or overnight at 4℃ with gentle shaking.
3. Discard the solution and wash 4 times with 1x Wash Solution. Wash by filling each well with Wash Buffer (300 µl) using a multi-channel Pipette or autowasher. Complete removal of liquid at each step is essential to good performance. After the last wash, remove any remaining Wash Buffer by aspirating or decanting. Invert the plate and blot it against clean paper towels.
4. Add 100 µl of 1x prepared biotinylated antibody to each well. Incubate for 1 hour at room temperature with gentle shaking.
5. Discard the solution. Repeat the wash as in step 3.
6. Add 100 µl of prepared Streptavidin solution to each well. Incubate for 45 minutes at room temperature with gentle shaking.
7. Discard the solution. Repeat the wash as in step 3.
8. Add 100 µl of TMB One-Step Substrate Reagent (Item H) to each well. Incubate for 30 minutes at room temperature in the dark with gentle shaking.
9. Add 50 µl of Stop Solution (Item I) to each well. Read at 450 nm immediately.

Summary

1. Prepare all reagents, samples and standards as instructed.
2. Add 100 µl standard or sample to each well. Incubate 2.5 hours at room temperature or overnight at 4℃.
3. Add 100 µl prepared biotin antibody to each well. Incubate 1 hour at room temperature.
4. Add 100 µl prepared Streptavidin solution. Incubate 45 minutes at room temperature.
5. Add 100 µl TMB One-Step Substrate Reagent to each well. Incubate 30 minutes at room temperature.
6. Add 50 µl Stop Solution to each well. Read at 450 nm immediately

Data Analysis

Calculation of Results

Calculate the mean absorbance for each set of duplicate standards, controls and samples, and subtract the average zero standard optical density. Plot the standard curve on log-log graph paper or using Sigma plot software, with standard concentration on the x-axis and absorbance on the y-axis. Draw the best-fit straight line through the standard points.

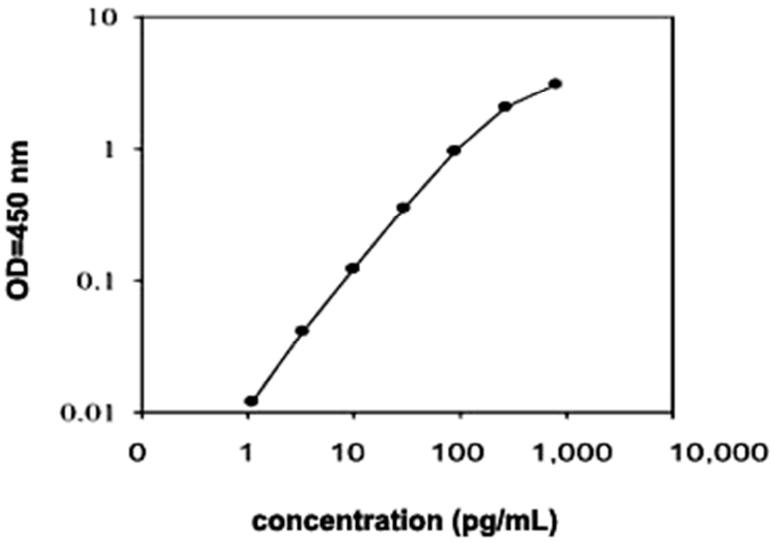


Figure 1: Typical Standard Curve for GDF15 (Human) ELISA Kit.

Performance Characteristics

- Sensitivity
  The minimum detectable dose of GDF-15 is typically less than 2 pg/ml.

- Recovery
  Recovery was determined by spiking various levels of human GDF-15 into human serum, plasma and cell culture media. Mean recoveries are as follows:

Sample Type	Average % Recovery	Range (%)
Serum	104.2	92-116
Plasma	102.9	88-119
Cell culture media	114.2	96-105

- Linearity

Sample Type		Serum	Plasma	Cell Culture Media
1:2	Average % of Expected	121.0	123.2	110.0
	Range (%)	110-131	115-128	93-107
1:4	Average % of Expected	97.99	75.89	82.30
	Range (%)	87-107	67-84	67-97

- Reproducibility

  Intra-Assay: CV<10%

  Inter-Assay: CV<12%

- Specificity

  Cross Reactivity: This ELISA kit shows no cross-reactivity with the following cytokines tested: human Angiogenin, BDNF, BLC, CNTF, ENA-78, FGF-4, IL-1α, IL-1β, IL-2, IL-3, IL-4, IL-5, IL-6, IL-7, IL-8, IL-9, IL-11, IL-12 p70, IL-12 p40, IL-13, IL-15, IL-309, IP-10, FGF-4, FGF-6, FGF-7, G-CSF, GDNF, GM-CSF, IFN-γ, IGFBP-2, IGF-BP-3, IGF-BP-4, Leptin (OB), MCP-1, MCP-2, MCP-3, MDC, MIF, MIG, MIP-1α, MIP-1 β, MIP-1δ, PARC, PDGF, RANTES, SCF,SDF-1alpha, TARC, TGF-β, TIMP-1, TIMP-2, TNF-α, TNF-β, TPO, VEGF.

Resources

Troubleshooting

Problem	Cause	Solution
1. Poor standard curve	1. Inaccurate pipetting 2. Improper standard dilution	1. Check pipettes 2. Ensure a brief spin of Item C and dissolve the powder thoroughly by a gentle mix.
2. Low signal	1. Too brief incubation times 2. Inadequate reagent volumes or improper dilution	1. Ensure sufficient incubation time; assay procedure step 2 may change to over night 2. Check pipettes and ensure correct preparation
3. Large CV	1. Inaccurate pipetting	1. Check pipettes
4. High background	1. Plate is insufficiently washed 2. Contaminated wash buffer	1. Review the manual for proper wash. If using a plate washer, check that all ports are unobstructed. 2. Make fresh wash buffer
5. Low sensitivity	1. Improper storage of the ELISA kit 2. Stop solution	1. Store your standard at <-20℃ after reconstitution, others at 4℃. Keep substrate solution protected from light 2. Stop solution should be added to each well before measure

Plate Layout

	A	B	C	D	E	F	G	H
12								
11								
10								
9								
8								
7								
6								
5								
4								
3								
2								
1								