



Technical Manual

Human VEGF-A PharmaGenie ELISA Kit

- **Catalogue Code: SBR1226**
- **Sandwich Principle**
- **Research Use Only**

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Key features and Sample Types

Aliases:

Vascular endothelial growth factor A (VEGF-A) (Vascular permeability factor) (VPF)

Gene ID:

7422

Uniprot:

P15692

Detection method:

Sandwich-based (Colorimetric)

Range:

8.23-6000pg/ml

Sensitivity:

10pg/ml

Sample Types:

Cell Culture Supernatants, Plasma, Serum

Reactivity:

Human

Storage & Expiry

The entire kit may be stored at -20°C for up to 1 year from the date of shipment. Avoid repeated freeze-thaw cycles. The kit may be stored at 4°C for up to 6 months. For extended storage, it is recommended to store at -80°C. For prepared reagent storage, see table below.

Introduction

VEGF (Vascular endothelial growth factor) is also called VEGF-A, following the identification of several VEGF-related factors (VEGF-B, VEGF-C, VEGF-D, VEGF-E). VEGF significantly influence vascular permeability and is a strong angiogenic protein in several Bioassays and probably also plays a role in neovascularisation under physiological conditions. VEGF plays a role in the development and function of primate follicles and the ovarian corpus luteum, supporting the proliferation of blood vessels. The differentiation of adipocytes, of pheochromocytomas, and myocytes is accompanied by the controlled expression of VEGF. It has been demonstrated that inhibition of VEGF activity by treatment with a monoclonal antibody specific for VEGF can suppress tumor growth *in vivo*.

How do our ELISA kits work?

The Assay Genie Human VEGF ELISA kit is an *in vitro* enzyme-linked immunosorbent assay for the quantitative measurement of human VEGF in serum, plasma, and cell culture supernatants. This assay employs an antibody specific for human VEGF coated on a 96-well plate. Standards and samples are pipetted into the wells and VEGF present in a sample is bound to the wells by the immobilized antibody. The wells are washed and biotinylated antihuman VEGF 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 VEGF bound. The Stop Solution changes the color from blue to yellow, and the intensity of the color is measured at 450 nm.

Kit Contents

Each kit contains reagents for 96 assays including:

No.	Component	96-Well Kit	Storage
1	Microplate coated with anti-Human VEGF-A	8 x 12	1 month at 4°C*
2	Wash Buffer Concentrated (20X)	25ml	1 month at 4°C
3	Standard Protein	2 vials	1 week at -80°C
4	Detection Antibody anti-Human VEGF-A	2 vials	5 days at 4°C
5	HRP-Streptavidin Concentrate (300X)	200µl	Do not store and reuse.
6	TMB One-Step Substrate Reagent	12ml	N/A
7	Stop Solution	8ml	N/A
8	Assay Diluent A	30ml	N/A
9	Assay Diluent B (5x)	15ml	1 month at 4°C

*Return unused wells to the pouch containing desiccant pack, reseal along entire edge.

Additional materials required:

1. Microplate reader capable of measuring absorbance at 450 nm.
2. Precision pipettes to deliver 2 µl to 1 ml volumes.
3. Adjustable 1-25 ml pipettes for reagent preparation.
4. 100 ml and 1 litre graduated cylinders.
5. Absorbent paper.
6. Distilled or deionized water.
7. Log-log graph paper or computer and software for ELISA data analysis.
8. Tubes to prepare the positive control or sample dilutions.

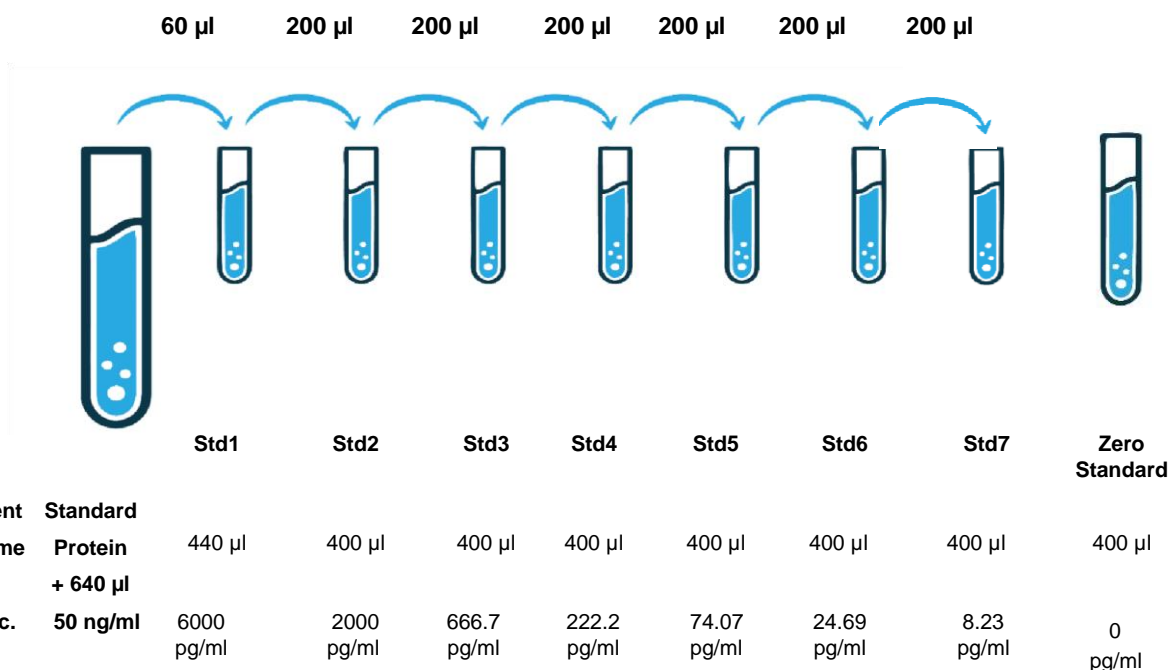
Reagent Preparation

1. Bring all reagents and samples to room temperature (18 - 25°C) before use.
2. Assay Diluent B should be diluted 5-fold with deionized or distilled water before use.
3. Sample dilution: Assay Diluent A should be used for dilution of serum and plasma samples. 1X Assay Diluent B should be used for dilution for cell culture supernatant samples. The suggested dilution for normal serum/plasma is 2-5 fold.

Note: Levels of VEGF-A may vary between different samples. Optimal dilution factors for each sample must be determined by the investigator.

4. Preparation of standard: Briefly spin a vial of Standard Protein. Add 640 µl Assay Diluent A (for serum/plasma samples) or 1X Assay Diluent B (for cell culture medium) into Standard Protein vial to prepare a 50 ng/ml standard. Dissolve the powder thoroughly by a gentle mix. Add 60 µl of 50ng/ml VEGF-A standard from the vial of Standard Protein, into a tube with 440 µl Assay Diluent A or 1X Assay Diluent B to prepare a 6,000 pg/ml stock standard solution. Pipette 400 µl Assay Diluent A or 1X Assay Diluent B into each tube. Use the stock standard solution to produce a dilution series (shown below). Mix each tube thoroughly before the next transfer. Assay Diluent A or 1X Assay Diluent B serves as the zero standard (0 pg/ml).

DILUTION SERIES



5. If the Wash Concentrate (20X) 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.

6. Briefly spin the Detection Antibody vial before use. Add 100 μ l of 1X Assay Diluent B into the vial to prepare a detection antibody concentrate. Pipette up and down to mix gently (the concentrate can be stored at 4°C for 5 days). The detection antibody concentrate should be diluted 100-fold with 1X Assay Diluent B and used in step 5 of the Assay Procedure.

7. Briefly spin the HRP-Streptavidin concentrate vial and pipette up and down to mix gently before use, as precipitates may form during storage. HRP-Streptavidin concentrate should be diluted 300-fold with 1X Assay Diluent B.

For example: Briefly spin the HRP-Streptavidin Concentrate vial and pipette up and down to mix gently. Add 40 μ l of HRP-Streptavidin concentrate into a tube with 12 ml 1x Assay Diluent B to prepare a 300-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°C) before use. It is recommended that all standards and samples be run at least in duplicate.
2. Label removable 8-well strips as appropriate for your experiment.
3. Add 100 μ l of each standard (see Reagent Preparation step 3) and sample into appropriate wells. Cover wells and incubate for 2.5 hours at room temperature with gentle shaking.
4. Discard the solution and wash 4 times with 1X Wash Solution. Wash by filling each well with Wash Buffer (300 μ l) 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.
5. Add 100 μ l of 1X prepared biotinylated antibody (Reagent Preparation step 6) to each well. Incubate for 1 hour at room temperature with gentle shaking.

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6. Discard the solution. Repeat the wash as in step 4.
 7. Add 100 μ l of prepared Streptavidin solution (see Reagent Preparation step 7) to each well. Incubate for 45 minutes at room temperature with gentle shaking.
 8. Discard the solution. Repeat the wash as in step 4.
 9. Add 100 μ l of TMB One-Step Substrate Reagent to each well. Incubate for 30 minutes at room temperature in the dark with gentle shaking.
 10. Add 50 μ l of Stop Solution to each well. Read at 450 nm immediately.

Assay Procedure Summary

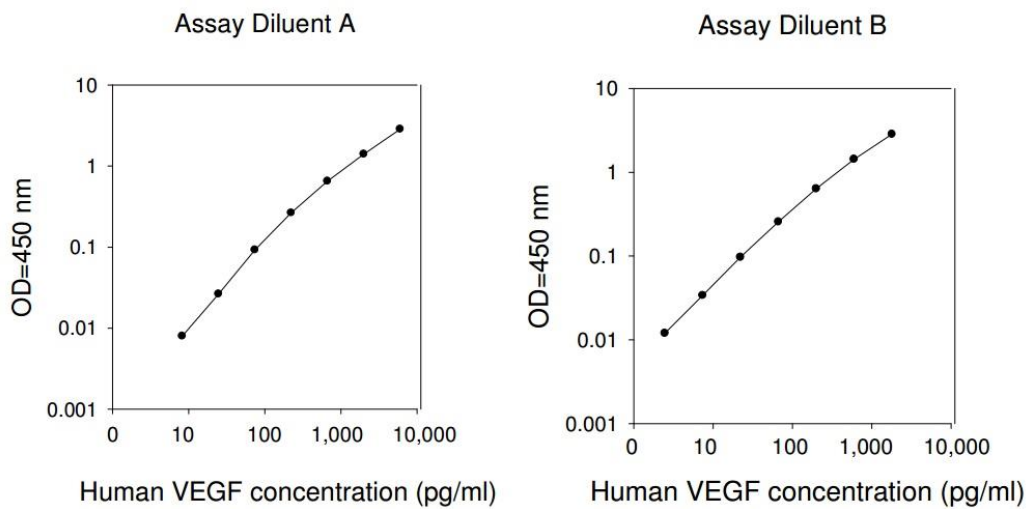
1. Prepare all reagents, samples and standards as instructed.
2. Add 100 μ l standard or sample to each well. Incubate 2.5 hours at room temperature.
3. Add 100 μ l prepared biotin antibody to each well. Incubate 1 hour at room temperature.
4. Add 100 μ l prepared Streptavidin solution. Incubate 45 minutes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

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.

Typical Data

These standard curves are for demonstration only. A standard curve must be run with each assay.



B. Sensitivity

The minimum detectable dose of Human VEGF-A was determined to be 10 pg/ml.

Minimum detectable dose is defined as the analyte concentration resulting in an absorbance that is 2 standard deviations higher than that of the blank (diluent buffer).

C. Spiking and Recovery

Recovery was determined by spiking various levels of Human VEGF-A into the sample types listed below. Mean recoveries are as follows:

Sample Type	Average % Recovery	Range (%)
Serum	104.4	92-115
Plasma	105.7	93-114
Cell culture media	103.5	92-113

D. Linearity

Sample Type	Serum	Plasma	Cell Culture Media
1:2 Average % of Expected Range (%)	96 92-113	97 91-114	97 90-111
1:4 Average % of Expected Range (%)	97 91-112	96 88-108	102 91-113

E. Reproducibility

Intra-Assay CV%: <10%

Inter-Assay CV%: <12%

Specificity

This ELISA kit shows no cross-reactivity with any of the cytokines tested: Human Angiogenin, BDNF, BLC, ENA-78, FGF-4, IL-1 alpha, IL-1 beta, IL-2, IL-3, IL-4, IL-5, IL-7, IL-8, IL-9, IL-10, IL-11, IL-12 p70, IL-12 p40, IL-13, IL-15, I-309, IP-10, G-CSF, GM-CSF, IFN-gamma, Leptin, MCP-1, MCP-2, MCP-3, MDC, MIP-1 alpha, MIP-1 beta, MIP-1 delta, PARC, PDGF, RANTES, SCF, TARC, TGF-beta, TIMP-1, TIMP-2, TNF-alpha, TNF-beta, TPO.

Troubleshooting

Problem	Causes	Solutions
Low signal in samples	<ul style="list-style-type: none"> • Sample concentration is too low • Improper preparation of detection antibody • Too brief incubation times • Inadequate reagent volumes or improper dilution 	<ul style="list-style-type: none"> • Increase sample concentration • Briefly spin down vials before opening. Dissolve the powder thoroughly. • Ensure sufficient incubation time; assay procedure step 3 may be done overnight • Check pipettes and ensure correct preparation
Poor standard curve	<ul style="list-style-type: none"> • Inaccurate pipetting • Improper standard dilution 	<ul style="list-style-type: none"> • Check pipettes • Briefly centrifuge Standard Protein and dissolve the powder thoroughly by gently mixing
Large CV	<ul style="list-style-type: none"> • Inaccurate pipetting • Air bubbles in wells 	<ul style="list-style-type: none"> • Check pipettes • Remove bubbles in wells
High background	<ul style="list-style-type: none"> • Plate is insufficiently washed • Contaminated wash buffer 	<ul style="list-style-type: none"> • Review the manual for proper wash. If using a plate washer, ensure that all ports are unobstructed. • Make fresh wash buffer
Low sensitivity	<ul style="list-style-type: none"> • Improper storage of the ELISA kit • Stop solution • Improper primary or secondary antibody dilution 	<ul style="list-style-type: none"> • Store your standard at $<-70^{\circ}\text{C}$ after reconstitution, others at 4°C. Keep substrate solution protected from light. • Add stop solution to each well before reading plate • Ensure correct dilution

Assay Genie 100% money-back guarantee!

If you are not satisfied with the quality of our products and our technical team cannot resolve your problem, we will give you 100% of your money back.

Contact Details

