



人的血管内皮生长因子定量分析酶联免疫检测试剂盒

本试剂盒仅供科研使用。用于体外定量检测人血清、血浆或细胞培养上清液中的 VEGF 浓度。**使用前请仔细阅读说明书并检查试剂组分是否完整。**如有产品包装破损或质量投诉，请在收到货一个月之内联系我们。

VEGF简介：

VEGF属于PDGF因子家族，是A、B、C、D四种亚类的一类因子的总称，它们在血管发生过程中起重要作用。其中在血管再生和内皮细胞的再生过程中，VEGF-A扮演重要的角色。现已发现VEGF-A有许多种因切割后氨基酸数不同的亚型，其中含有的肝磷脂接合区域，能与胞外基质内的肝磷脂结合，以VEGF165量最多。VEGF-A可由多种细胞分泌的分子量为45kDa的糖蛋白。

VEGF的功能主要表现在伤口的愈合和女性生殖周期循环上。在病理组织中，VEGF能提升血管通透性。这就是肿瘤的转移和肿瘤复发的基础。在胚胎期，VEGF的作用表现为调控胚胎细胞的增殖、转移和提高内皮细胞的存活力上，通过成骨细胞和成软骨细胞的募集作用提升骨形成的效率。VEGF-A的功能还表现在一些如血管再生和血管通透相关联的生理过程中。肿瘤释放的细胞因子和生长因子能刺激骨髓中的巨核细胞分裂为血小板，这样就间接增加了VEGF-A向肿瘤的迁移。

骨组织、心肌、肝实质、成骨细胞、中性粒细胞、巨噬细胞、角化细胞、棕色脂肪组织、CD34+干细胞、内皮细胞、成纤维细胞和血管平滑肌细胞等细胞和组织均可表达 VEGF。

检测原理：

本试剂盒采用双抗体夹心ELISA法检测样本中VEGF 的浓度。VEGF 捕获抗体已预包被于酶标板上，当加入标本或参考品时，其中的VEGF 会与捕获抗体结合，其它游离的成分通过洗涤的过程被除去。当加入生物素化的抗人VEGF 抗体后，抗人VEGF 抗体与VEGF 接合，形成夹心的免疫复合物，其它游离的成分通过洗涤的过程被除去。随后加入辣根过氧化物酶标记的亲合素。生物素与亲合素特异性结合，亲合素连接的酶就会与夹心的免疫复合物连接起来；其它游离的成分通过洗涤的过程被除去。最后加入显色剂，若样本中存在VEGF 将会形成免疫复合物，辣根过氧化物酶会催化无色的显色剂氧化成蓝色物质，在加入终止液后呈黄色。通过酶标仪检测，读其450nm处的OD值，VEGF 浓度与OD₄₅₀值之间呈正比，通过参考品绘制标准曲线，对照未知样本中OD值，即可算出标本中VEGF 浓度。

人VEGF定量分析酶联免疫检测试剂盒组成：

组分	规格（96T/48T）
人VEGF预包被板	12条/6条
样本分析缓冲液	5ml/3ml
标准品稀释液	10ml/5ml
人VEGF标准品	4/2支(冻干)
人VEGF生物素化抗体	10ml/5ml
亲和素连接的HRP酶	10ml/5ml
浓缩洗涤液 20×	30ml/15ml
TMB底物	10ml/5ml
中止液	5ml/3ml
封板胶纸	3/2张
说明书	1份

标本收集：

1. 标本的收集请按下列流程进行操作：
 - A. 细胞上清标本离心去除悬浮物后即可；
 - B. 血清标本应是自然凝固后，取上清，避免在冰箱中凝固血液；
 - C. 血浆标本，推荐用EDTA的方法收集；



- D. 若待测样本不能及时检测，标本收集后请分装，冻存于 -20°C ，避免反复冻融。
- 血清标本不应添加任何防腐剂或抗凝剂；
- 标本应清澈透明，检测前样本中如有悬浮物应通过离心去除。
- 请勿使用溶血，高血脂或污染的标本检测，否则结果将不准确。

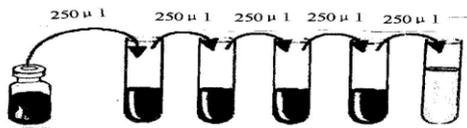
注：人血清或血浆样本请用样本分析缓冲液做倍比稀释后再检测。

注意事项：

- 试剂盒请保存在 $2\sim 8^{\circ}\text{C}$ 。
- 浓缩洗涤液因在低温下可能有结晶，请水浴加热使结晶完全溶解后再配制工作液。
- 标准品复溶加样后，剩余部份请丢弃。
- 底物请勿接触氧化剂和金属。
- 加样时，请及时更换枪头，避免交叉污染。
- 严禁混用不同批号的试剂盒组份。
- 充分混匀对保证反应结果的准确性很重要，在加液后请轻轻叩击边缘以保证混匀。
- 室温反应，请严格控制在 $25\sim 28^{\circ}\text{C}$ 。
- 洗涤过程是至关重要的，洗涤不充分会使精确度下降并导致结果误差较大。
- 试验中标准品和样本检测时建议作双复孔。
- 加样过程中避免气泡的产生。
- 血清和血浆标本的检测时，检测抗体的孵育时间应当适当延长。

检测前准备工作：

- 试剂盒自冰箱中取出后应置室温($25\sim 28^{\circ}\text{C}$)平衡20分钟；每次检测后剩余试剂请及时于 $2\sim 8^{\circ}\text{C}$ 保存。
- 将浓缩洗涤液用双蒸水或去离子水稀释(1份加19份水)。
- 如有 $5\times$ 标准品稀释液用双蒸水或去离子水稀释(1份加4份水)。
- 标准品：按标签复溶体积用标准品稀释液复溶使 VEGF 终浓度达到 2000pg/ml ，室温反应，请严格控制在 $25\sim 28^{\circ}\text{C}$ ，静置 $15\sim 20$ 分钟后轻轻混悬（建议抽吸几次）待彻底溶解，用标准品稀释液倍比梯度稀释后依次加入检测孔中。（标准曲线取七个点，最高浓度为 2000pg/ml ，标准品稀释液直接加入作为 0 浓度。）



洗涤方法：

自动洗板机或人工洗板：每孔洗涤液为 $300\mu\text{l}$ ，注入与吸出间隔 $15\sim 30$ 秒。最后洗板完成后将板倒扣着在厚吸水纸上用力拍干。

实验过程需自备的材料：

- 不同规格的加样枪及相应的枪头；
- 酶标仪；
- 自动洗板机；
- 去离子水或双蒸水；

操作步骤：

- 通过计算并确定一次性实验所需的板条数，取出所需板条放置在框架内，暂时用不到板条请放回铝箔袋密封，保存于 4°C 。
- 建议设置本底校正孔，即空白孔，设置方法为该孔只加 TMB 显色液和中止液。每次实验均需做标准品对照并画出标准曲线。
- 分别将标本或不同浓度标准品($100\mu\text{l}/\text{孔}$)加入相应孔中，用封板胶纸封住反应孔，室温($25\sim 28^{\circ}\text{C}$)孵育120分钟。对于血清或血浆标本，请加入 $50\mu\text{l}$ 样本分析缓冲液后加 $50\mu\text{l}$ 标本，如稀释量大，请将样本与样本分析缓冲液等量加入，不足部分用标准品稀释液补充至 $100\mu\text{l}$ 。
- 洗板5次，且最后一次置厚吸水纸上拍干。
- 加入生物素化抗体工作液($100\mu\text{l}/\text{孔}$)。用封板胶纸封住反应孔，室温($25\sim 28^{\circ}\text{C}$)孵育60分钟。



6. 洗板5次，且最后一次置厚吸水纸上拍干。
7. 加入亲和素连接的HRP酶工作液(100ul/孔)。用封板胶纸封住反应孔，避光室温(25~28℃)孵育20分钟。
8. 洗板5次，且最后一次置厚吸水纸上拍干。
9. 加入显色剂TMB100ul/孔，避光室温(25~28℃)孵育20分钟。
10. 加入终止液50ul/孔，混匀后即刻测量OD450值。

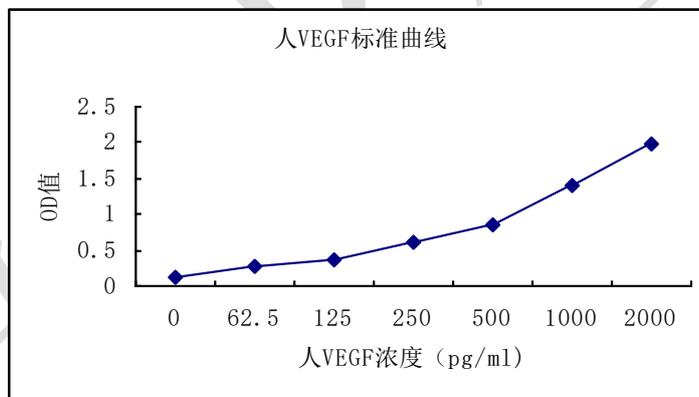
结果判断：

1. 复孔的值在20%的差异范围内结果才有效，复孔的值平均后可作为测量值。
2. 每个标准品或标本的OD值应减去本底校正孔的OD值。
3. 手工绘制标准曲线。以标准品浓度作横坐标，OD值作纵坐标，以平滑线连接各标准品的坐标点。通过标本的OD值可在标准曲线上查出其浓度。
4. 若标本 OD 值高于标准曲线上限，应适当稀释后重测，计算浓度时应乘以稀释倍数。

典型数值和参考曲线

浓度pg/ml	典型OD值1	典型OD值2	OD平均值
0	0.1107	0.1201	0.1154
62.5	0.2477	0.3166	0.2821
125	0.3417	0.3926	0.3671
250	0.5886	0.6269	0.6077
500	0.8284	0.8784	0.8534
1000	1.3247	1.4743	1.3995
2000	2.0638	2.0386	2.0512

人VEGF参考标准曲线



注意：本图仅供参考，应以同次试验标准品所绘标准曲线计算标本含量。

灵敏度，特异性和重复性：

1. 灵敏度：多次重复结果表明，最小检出量为3.7pg/ml。
2. 特异性：与人PLGF、VEGF-C、VEGF-D、小鼠 PLGF-2、VEGF120、VEGF164和大鼠VEGF164等没有交叉反应。
3. 重复性：板内，板间变异系数均<10%。

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ELISA Kit for the Quantitative Analysis of Human VEGF

The human VEGF ELISA (enzyme-linked immunosorbent assay) kit is used for detection of human VEGF in cell culture supernatants, human serum and plasma. **THE ELISA KIT IS FOR RESEARCH USE ONLY.** Please read this instruction manual carefully and check out the material provided before use, and you can contact with our company if any questions. You can enter our website or call us for other aim.

Introduction

VEGF with several members including VEGF-A, VEGF-B, VEGF-C- and VEGF-D, belonging to PDGF family, is best known for its role in vasculogenesis. VEGF-A is one of the key molecules for angiogenesis and the survival of the endothelium. Many different splice variants of VEGF-A have been described, in which VEGF165 is the most predominant protein and anchors with its heparin binding domain to extracellular matrix heparin. VEGF-A is a glycoprotein, secreted as a homodimer of 45 kDa by many different cell types.

VEGF functions mainly in wound healing and the female reproductive cycle. In diseased tissues, VEGF promotes vascular permeability. It is thus thought to contribute to tumor metastasis by promoting both extravasation and tumor angiogenesis. During embryogenesis, VEGF regulates the proliferation, migration, and survival of endothelial cells and promotes bone formation through osteoblast and chondroblast recruitment. VEGF-A is implicated in several other pathological conditions associated with enhancing angiogenesis or vascular permeability. Tumors can release cytokines and growth factors that stimulate the production of megakaryocytes in the marrow and elevate the platelet count. This can result in indirect increase of VEGF-A delivery to tumors.

VEGF is expressed in multiple cells and tissues including skeletal and cardiac muscle, hepatocytes, osteoblasts, neutrophils, macrophages, keratinocytes, brown adipose tissue, CD34+ stem cells, endothelial cells, fibroblasts, and vascular smooth muscle cells.

Principles of the Test

The kits is a solid sandwich enzyme-linked immunosorbent assay for detection of human VEGF. An anti-human VEGF monoclonal antibody has been absorbed onto the wells of the microtiter strips provided. Samples including specimens or standards were pipetted into wells. The human VEGF in specimens or standards would be captured by the coated antibody and the free others were removed by washing. The human VEGF biotin-conjugated antibody were added and binds to human VEGF captured by the first antibody, which formed a sandwich. Streptavidin-HRP would be added and binds to the biotin conjugated antibody, then free Streptavidin-HRP would be removed during a wash step. After this, substrate solution would be added and catalyzed by the HRP, and a coloured product is formed. The intensity of the colored product is used to calculate in proportion to the amount of human VEGF in the original specimen.

Materials provided with the kits:

reagent	96/48Test Kit
Assay Buffer	5ml/3ml
Human VEGF Antibody-Coated Wells	12 strips/6 strips
Standard Diluent	10ml/5ml
Human VEGF Standard	4/2vial(s)
Human VEGF Detetion Antibody	10ml/5ml
Streptavidin-HRP	10ml/5ml
Wash Buffer Concentrate 20x	30ml/15ml
TMB	10ml/5ml
Stop Solution	5ml/3ml
Plate Covers	3/2
Complete Instruction Manual	1

Specimen Collection

1. Collecting specimen as following:

A. The particulate of the cell culture supernatants should be removed before use.



- B.Serum was obtained from clot at room temperature.
C.Please collect plasma with EDTA.
D.Assay immediately or store samples at -20°C . Avoid free-thaw cycles.
2. Antiseptic and anticoagulant should not appear in Serum samples.
 - 3.Any particulate should be removed from samples before use.
 4. Do not use grossly hemolyzed or lipemic samples.

Note: Strongly recommend that the serum and plasma samples should be diluted as doubling dilution before use.

Precautions for use:

- 1.Please storage the Kit at $2\sim 8^{\circ}\text{C}$.
2. Washing buffer concentrate may have crystal in low temperature, and you can melt its in water-bath before use.
3. Please discard the remains after use of the dissolved standard.
4. Avoid contact of substrate solution with oxidizing agents and metal.
5. Usage of disposable pipette tips avoid microbial contamination or cross-contamination of reagents or specimens.
6. Do not mix or substitute reagents with those from other lots or other sources.
7. To ensure the adequate mixture of added reagents, please tap gently the plate after the wells were filled with liquid.
8. Incubation temperature should be $25\sim 28^{\circ}\text{C}$.
9. Wash step was crucial for whole assay process.
10. Duplicate wells of the same sample were recommended in assay process.
11. Avoid the foam while pour the liquid into wells.
12. For serum or plasma samples ,the biotin-conjugated antibody should be incubate for at least 90 minutes.

Reagent Preparation

- 1.The reagents should be warmed up to room temperature before use. The remanent reagents must reseal and put into refrigeratory again as soon as possible.
- 2.Dilute 1ml of wash buffer Concentrate into 19ml deionized or distilled water to work.
3. If you have a 5x standard diluent, please dilute it with double steaming water or deionized water.
4. Add standard diluent to the bottle according to the volume of the label and wait 15 minutes for complete dissolution. Incubation temperature should be $25\sim 28^{\circ}\text{C}$. And in turn add the half concentration diluent by standard diluent .

Wash step:

Automated microplate washer or operating by pipette: Each well should be pour into 300ul wash buffer and soak 15 or 30 seconds, then be aspirated, five times process were repeated. After the last wash, remove remaining wash buffer by aspirating. Invert the plate and blot it against clean paper towels.

Materials Required But Not Provided

1. pipettes and pipette tips
2. Microwell strip reader capable of reading at 450 nm (540 nm as optional reference wave length)
3. automated microplate washer
4. Glass-distilled or deionized water

Assay procedure

- 1.The needed strips were putted into the frame, the remains were returned into foil pouch and resealed.
2. Blank well were recommended, which only color reagent and stop solution be added. It is suggested that each testing with gradient density of standard for standard curve.
3. Add 100ul of standard or sample. Cover with the Plate Covers provided. Incubate for 2 hours at room temperature. If assay the serum sample, you should add 50ul assay buffer with 50ul sample into the wells, if the protein concentration is higher than the range of the Kit, add the same quantity assay buffer with the sample, the deficiency should be complemented with sample diluent to 100ul per well.
4. Five times wash process were repeated.
5. Add 100ul of detection antibody. Cover with the Plate Covers provided. Incubate for 1 hour at room temperature.
6. Five times wash process were repeated.
7. Add 100ul of Streptavidin-HRP. Cover with the Plate Covers provided. Lucifugal incubation for 20 minutes at room temperature.
8. Five times wash process were repeated.
9. Add 100ul of TMB, Lucifugal incubation for 20 minutes at room temperature.



10. Add 50ul of stop solution to each well, determine the optical density of each well within 10 minutes.

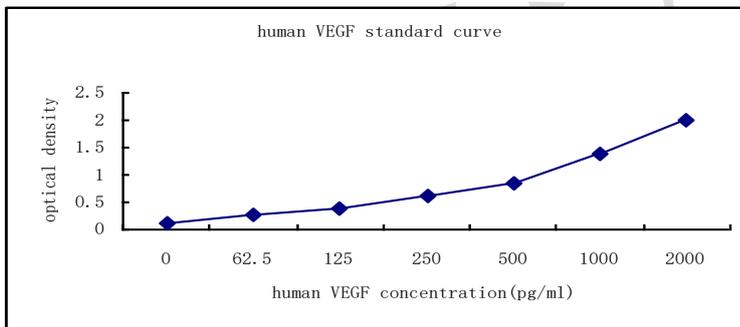
Calculation of Results

1. Duplicates should be within 20 per cent of the mean. Average absorbance values for each set of duplicate samples were used as detection results.
2. The blank absorbance values of subtract should be deducted.
3. Drawing a best fit curve through the points of graph. Draw the standard curve by plotting assayed OD value (on the Y axis) vs. concentration (on the X axis). The sample concentration was obtained based on its OD value founding in the standard concentration curve.
4. If the values obtained are not within the expected range of the standard, Samples should be dilute and assay again.

Typical Data and Standard Curve

Concentration (pg/ml)	Typical data 1	Typical data 2	Average
0	0.1107	0.1201	0.1154
62.5	0.2477	0.3166	0.2821
125	0.3417	0.3926	0.3671
250	0.5886	0.6269	0.6077
500	0.8284	0.8784	0.8534
1000	1.3247	1.4743	1.3995
2000	2.0638	2.0386	2.0512

Human VEGF standard curve



Sensitivity, Specificity, Repeatability

Sensitivity: repeated assays were evaluated and the minimum detectable dose was 3.7pg/ml.

Specificity : No significant cross-reactivity or interference with humanPLGF, VEGF-C, VEGF-D, Mouse PLGF-2, VEGF120, VEGF164and rat VEGF164.

Repeatability: The coefficient of variation between wells or plates is less than 10 per cent.

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