PRODUCT INFORMATION & MANUAL

Human TGF-β1 Valukine™ ELISA

Catalog Number: VAL127

For the quantitative determination of natural and recombinant human TGF-β1 concentrations

For research use only.
Not for diagnostic or therapeutic procedures.

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Please refer to the kit label for expiry date.
Novus kits are guaranteed for 3 months from date of receipt

Version 202401.4

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I. BACKGROUND

Human TGF-β1 is a 25 kDa, disulfide-linked homodimeric protein involved in a number of key developmental, immunologic, and homeostatic processes (1-4). The traditional high-affinity receptor for TGF-β1 is a heteromeric complex consisting of transmembrane serine/threonine kinases. Two types are involved; a constitutively phosphorylated, ligand-binding 80 kDa glycoprotein termed TβRII and a signal-transducing, non-ligand-binding 55 kDa glycoprotein termed TβRI/ALK-5 (5-8).

TGF-β1 has a wide range of activities. During an immune response, TGF-β1 impacts antibody production by preferentially inducing IgA production in both mouse and human (9). It also regulates dendritic cell chemotaxis by altering the expression of chemokine receptors (10). And, it can downmodulate an inflammatory response by dampening macrophage activity and proinflammatory secretion (11). During wound healing, TGF-β1 is released from activated platelets. This local source of TGF-β1 has marked stimulatory effects on fibroblasts, where it induces matrix synthesis; on monocytes, where it induces proinflammatory mediator and growth factor secretion; and on keratinocytes, where it may promote keratinocyte proliferation by downmodulating its own signaling pathway (12). Finally, TGF-β1 may play a role in endochondral ossification, and its absence results in severely defective yolk sac vasculogenesis and hematopoiesis (13, 14).

II. OVERVIEW

A. PRINCIPLE OF THE ASSAY

This assay employs the quantitative sandwich enzyme immunoassay technique. An antibody specific for human TGF-β1 has been pre-coated onto a microplate. Standards and samples are pipetted into the wells and any TGF-β1 present is bound by the immobilized antibody. After washing away any unbound substances, a biotin-linked detect antibody specific for human TGF-β1 are pipetted into the wells. After washing away any unbound substances, Streptavidin-HRP is added. Following a wash to remove any unbound antibody-enzyme reagent, TMB substrate solution (Chromogenic agent) is added to the wells and color develops in proportion to the amount of human TGF-β1 bound in the initial step. The color development is stopped, and the intensity of the color is measured.

B. LIMITATIONS OF THE PROCEDURE

- **FOR RESEARCH USE ONLY NOT FOR USE IN DIAGNOSTIC PROCEDURES.**
- This kit is suitable for cell culture supernate and human serum.
- The kit should not be used beyond the expiration date on the kit label.
- Do not mix or substitute reagents with those from other lots or sources.
- If samples generate values higher than the highest standard, dilute the samples with Reagent Diluent 1 (1×) and repeat the assay.
- Any variation in operator, pipetting technique, washing technique, incubation time or temperature, and kit age can cause variation in binding.

III. ADVANTAGES

A. PRECISION

Intra-assay Precision (Precision within an assay)

Three samples were tested twenty times on one plate to assess intra-assay precision.

Inter-assay Precision (Precision between assays)

Three samples were tested in twenty separate assays to assess inter-assay precision.

	Intra-assay Precision			**Inter-assay Precision**		
Sample	1	2	3	1	2	3
Mean (pg/mL)	61.7	214.1	917.0	61.1	211.6	888.8
Standard Deviation	1.4	5.8	37.5	0.4	2.9	27.1
CV%	2.3	2.7	4.1	3.8	1.4	3.0

B. RECOVERY

The recovery of human TGF-β1 spiked to three levels throughout the range of the assay in cell culture media was evaluated. The recovery ranged from 105.8 to 116.0% with an average of 109.9%.

The recovery of human TGF-β1 spiked to three levels throughout the range of the assay in serum samples were evaluated. The recovery ranged from 82.7 to 94.4% with an average of 89.5%.

C. SENSITIVITY

The minimum detectable dose (MDD) of human TGF-β1 is typically less than 5.21 pg/mL.

The MDD was determined by adding two standard deviations to the mean optical density value of twenty zero standard replicates and calculating the corresponding concentration.

D. CALIBRATION

This immunoassay is calibrated against a highly purified CHO cell-expressed recombinant human TGF-β1 produced at R&D Systems®.

E. LINEARITY

To assess the linearity of the assay, samples spiked with high concentrations of TGF-β1 and diluted with Reagent Diluent 1 (1×) to produce samples with values within the dynamic range of the assay.

Dilution	Average % of Expected	Range (%)
1:2	103.1	91.3-117.3
1:4	103.3	88.0-118.1
1:8	103.6	84.6-126.2
1:16	102.7	80.1-129.6

F. SAMPLE VALUES

Six serum samples were evaluated for the presence of TGF-β1 in this assay. All samples measured ranged from 23.0 to 31.4 ng/mL with an average of 26.5 ng/mL.

G. SPECIFICITY

The factors below were assayed and exhibited the following cross-reactivity:

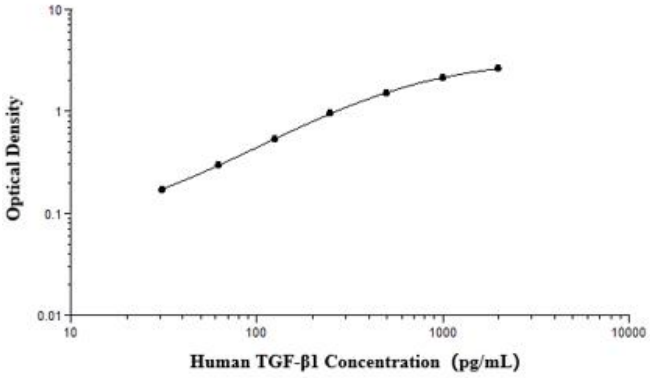
Factor	Concentration Test (pg/mL)	Observed Value (pg/mL)	Cross-reactivity
pTGF-β2	50,000	145	0.3%
rhTGF-β1.2	2,500	1421	57%
rhTGF-β2	50,000	74	0.15%
rhTGF-β3	50,000	481	0.96%
raTGF-β5	50,000	904	1.8%

A sample containing 25 ng/mL of recombinant human Latent TGF-β1 reads as 37.4 pg/mL (0.15% cross-reactivity).

IV. EXPERIMENT

EXAMPLE STANDARD

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



pg/mL	OD	Average	Corrected
0	0.019	0.019	-
	0.018		
31.25	0.172	0.169	0.151
	0.166		
62.5	0.294	0.296	0.278
	0.298		
125	0.546	0.539	0.520
	0.531		
250	0.955	0.949	0.931
	0.943		
500	1.546	1.514	1.495
	1.481		
1000	2.173	2.155	2.137
	2.137		
2000	2.649	2.617	2.598
	2.584		

V. KIT COMPONENTS AND STORAGE

A. MATERIALS PROVIDED

Parts	Description	Size
Human TGF-β1 Microplate	96 well polystyrene microplate (12 strips of 8 wells) coated with a mouse antibody against human TGF-β1.	1 plate
Human TGF-β1 Standard	Recombinant human TGF-β1 in a buffered protein base; lyophilized. Refer to the vial label for reconstitution volume.	2 vials
Human TGF-β1 Detection Antibody	Biotinylated TGF-β1 polyclonal antibody, lyophilized. Refer to the vial label for reconstitution volume.	1 vial
Streptavidin-HRP B (40×)	40× Streptavidin conjugated to horseradish peroxidase.	1 vial
Reagent Diluent Concentrate 1	Reagent Diluent Concentrate 1 buffered protein base used to dilute samples, HRP and standard.	1 vial
Detection Antibody Diluent Concentrate (5×)	A 5× concentrated buffered base used to dilute Detection Antibody.	1 vial
1 N HCl	1× buffered base used to activate samples.	1 vial
1.2 N NaOH/0.5M HEPES	1× buffered base used to activate samples.	1 vial
Wash Buffer Concentrate (25×)	A 25× concentrated solution of buffered surfactant with preservatives.	2 vials
TMB Substrate	TMB ELISA Substrate Solution	1 vial
Stop Solution	2 N sulfuric acid.	1 vial
Plate Sealers	Adhesive strips.	3 strips

B. STORAGE

<table>
<tr><td>Unopened Kit</td><td colspan="2">Store at 2-8 °C. Do not use past kit expiration date.</td></tr>
<tr><td rowspan="9">Opened/ Reconstituted Reagents</td><td>Streptavidin-HRP B</td><td rowspan="6">May be stored for up to 1 month at 2-8 °C.*</td></tr>
<tr><td>Diluted Wash Solution</td></tr>
<tr><td>TMB Substrate</td></tr>
<tr><td>Stop Solution</td></tr>
<tr><td>1N HCl</td></tr>
<tr><td>1.2N NaOH/0.5M HEPES</td></tr>
<tr><td>Standard</td><td>Prepare fresh for each assay.</td></tr>
<tr><td>Detection Antibody</td><td>Aliquot and store for up to 1 month at -20 °C in a manual defrost freezer. *</td></tr>
<tr><td>Reagent Diluent Concentrate 1</td><td>May be stored for up to 1 month at 2-8 °C.*
Use and discard diluted Reagent Diluent 1 (1×). Prepare fresh for each assay.</td></tr>
<tr><td>Detection Antibody Diluent Concentrate (5×)</td><td>May be stored for up to 1 month at 2-8 °C.*
Use and discard diluted Detection Antibody Diluent (1×). Prepare fresh for each assay.</td></tr>
<tr><td>Microplate Wells</td><td>Return unused wells to the foil pouch containing the desiccant pack, reseal along entire edge of zip-seal. May be stored for up to 1 month at 2-8 °C.*</td></tr>
</table>

* Provided this is within the expiration date of the kit.

C. OTHER SUPPLIES REQUIRED

- Microplate reader capable of measuring absorbance at 450 nm, with the correction wavelength set at 540 nm or 570 nm.
- Pipettes and pipette tips.
- Deionized or distilled water.
- Squirt bottle, manifold dispenser, or automated microplate washer.
- Test tubes for dilution of standards.
- 100 mL and 500 mL graduated cylinder.

D. PRECAUTION

- Some components in this kit contain a preservative which may cause an allergic skin reaction. Avoid breathing mist.
- The Stop Solution provided with this kit is an acid solution. Wear protective gloves, clothing, eye, and face protection. Wash hands thoroughly after handling.

VI. PREPARATION

A. SAMPLE COLLECTION AND STORAGE

Cell Culture Supernates - Remove particulates by centrifugation and assay immediately or aliquot and store samples at ≤ -20°C. Avoid repeated freeze-thaw cycles. Samples may require dilution with Reagent Diluent 1 (1×).

Serum - Use a serum separator tube (SST) and allow samples to clot for 30 minutes at room temperature before centrifugation for 15 minutes at 1000 × g. Remove serum and assay immediately or aliquot and store samples at ≤ -20°C. Avoid repeated freeze-thaw cycles. Samples may require dilution with Reagent Diluent 1 (1×).

B. SAMPLE ACTIVATION PROCEDURE

To activate latent TGF-β1 to immunoreactive TGF-β1 detectable by the TGF-β1 immunoassay, follow the activation procedure outlined below. Assay samples after neutralization (pH 7.2-7.6). **Use polypropylene test tubes.**

Cell Culture Supernates	**Serum**
To 100 µL of cell culture supernate, add 20 µL of 1 N HCl.	To 40 µL serum, add 20 µL of 1 N HCl.
Mix well.	Mix well.
Incubate 10 minutes at room temperature.	Incubate 10 minutes at room temperature.
Neutralize the acidified sample by adding 20 µL of 1.2 N NaOH/0.5 M HEPES.	Neutralize the acidified sample by adding 20 µL of 1.2 N NaOH/0.5 M HEPES.
Mix well.	Mix well.
Assay immediately.	Prior to the assay, dilute the activated sample with Reagent Diluent 1(1×). See the following for suggested dilutions.
The concentration read off the standard curve must be multiplied by the dilution factor, 1.4.	The concentration read off the standard curve must be multiplied by the appropriate dilution factors*.

***Activated serum samples may be stored for up to 24 hours at 2-8 °C before use. Activated cell culture supernates samples must be assayed immediately after activation. Do not freeze activated samples.**

C. SAMPLE PREPARATION

Cell culture supernate samples recommend at least a 1.4-fold dilution prior to the assay. A suggested 1.4-fold dilution is activation of the sample. Optimal dilutions should be determined by the end user.

*Activated Serum samples recommend at least a 50-fold dilution prior to the assay. A suggested 50-fold dilution is 20 µL of Activated sample + 980 µL of Reagent Diluent 1 (1×). (The final dilution factor is 100). Optimal dilutions should be determined by the end user.

D. REAGENT PREPARATION

Note: *Bring all reagents to room temperature before use.*

Wash Buffer - If crystals have formed in the concentrate, warm to room temperature and mix gently until the crystals have completely dissolved. Dilute 20 mL of Wash Buffer Concentrate (25×) into deionized or distilled water to prepare 500 mL of Wash Buffer.

Reagent Diluent 1 (1×) - Add 1.4 mL of Reagent Diluent Concentrate 1 to 98.6 mL of 1×Wash Buffer to prepare 100 mL of Reagent Diluent 1 (1×).

Detection Antibody Diluent (1×) - Use deionized or distilled water to prepare Detection Antibody Diluent (1×).

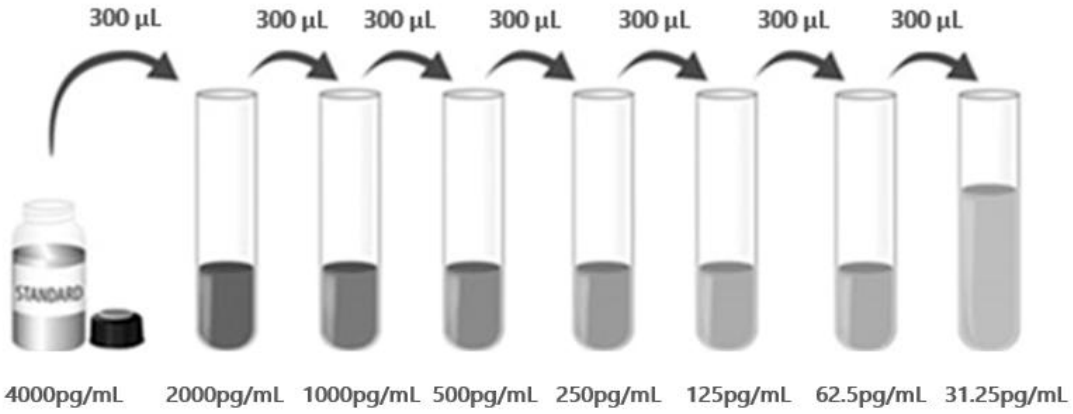
Detection Antibody (1×) - Centrifuge briefly before opening. Reconstitution volume refer to vial label to prepare Detection Antibody (100×). Allow the Detection Antibody to sit for a minimum of 15 minutes with gentle agitation prior to making dilutions. Aliquot and store if needed. Dilute to Detection Antibody (1×) with Detection Antibody Diluent (1×). Prepare at least 15 minutes prior to use.

Streptavidin-HRP B (1×) - Centrifuge briefly before opening. Dilute to the working concentration specified on the vial label using Reagent Diluent 1 (1×).

Human TGF-β1 Standard - Centrifuge briefly before opening. Refer to the vial label for the reconstitution volume* using Reagent Diluent 1 (1×). This reconstitution produces a stock solution of 4000 pg/mL. Allow the standard to sit for a minimum of 15 minutes with gentle agitation prior to making dilutions.

*If you have any question, please seek help from our Technical Support.

Pipette 300 µL of Reagent Diluent 1 (1×) into each tube. Use the stock solution to produce a dilution series (below). Mix each tube thoroughly before the next transfer. The 2000 pg/mL standard serves as the high standard. The **Reagent Diluent 1 (1×)** serves as the zero standard (0 pg/mL).



E. TECHNICAL HINTS

- When mixing or reconstituting protein solutions, always avoid foaming.
- To avoid cross-contamination, change pipette tips between additions of each standard level, between sample additions, and between reagent additions. Also, use separate reservoirs for each reagent.
- It is recommended that the samples be pipetted within 15 minutes.
- To ensure accurate results, proper adhesion of plate sealers during incubation steps is necessary.
- TMB substrate should remain colorless until added to the plate. Keep TMB Substrate Solution protected from light. TMB Substrate Solution should change from colorless to gradations of blue.
- Stop Solution should be added to the plate in the same order as the TMB substrate. The color developed in the wells will turn from blue to yellow upon addition of the Stop Solution. Wells that are green in color indicate that the Stop Solution has not mixed thoroughly with the TMB substrate.

VII. ASSAY PROCEDURE

Note: *Bring all reagents and samples to room temperature before use. It is recommended that all samples and standards be assayed in duplicate.*

1. Prepare all reagents and working standards as directed in the previous sections.
2. Remove excess microplate strips from the plate frame, return them to the foil pouch containing the desiccant pack, and reseal.
3. Add 100 µL of Standard, or prepared sample per well. Cover with the adhesive strip provided. **Incubate for 2 hours at room temperature.** A plate layout is provided for a record of standards and samples assayed. (Samples may require dilution. See Sample Preparation section.)
4. Aspirate each well and wash, repeating the process three times for a total of four washes. Wash by filling each well with Wash Solution (400 µL) using a squirt bottle, manifold dispenser, 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 µL of the Detection Antibody diluted in Detection Antibody Diluent(1×), to each well. Cover with a new adhesive strip and **incubate 2 hours at room temperature.**
6. Repeat the aspiration/wash as in step 4.
7. Add 100 µL of the working dilution of Streptavidin-HRP B to each well. Cover the plate and **incubate for 20 minutes at room temperature. Avoid placing the plate in direct light**.
8. Repeat the aspiration/wash as in step 4.
9. Add 100 µL of TMB Substrate to each well. **Incubate for 20 minutes at room temperature. Avoid placing the plate in direct light**.
10. Add 50 µL of Stop Solution to each well. Gently tap the plate to ensure thorough mixing.
11. Determine the optical density of each well within 10 minutes, using a microplate reader set to 450 nm. If wavelength correction is available, set to 540 nm or 570 nm. If wavelength correction is not available, subtract readings at 540 nm or 570 nm from the readings at 450 nm. This subtraction will correct for optical imperfections in

the plate. Readings made directly at 450 nm without correction may be higher and less accurate.

12. CALCULATION OF RESULTS

Average the duplicate readings for each standard and sample and subtract the average zero standard optical density (O.D.). Create a standard curve by reducing the data using computer software capable of generating a four parameter logistic (4-PL) curve-fit. As an alternative, construct a standard curve by plotting the mean absorbance for each standard on the y-axis against the concentration on the x-axis and draw a best fit curve through the points on the graph. The data may be linearized by plotting the log of the human TGF-β1 concentrations versus the log of the O.D. and the best fit line can be determined by regression analysis. This procedure will produce an adequate but less precise fit of the data.

If samples have been diluted, the concentration read from the standard curve must be multiplied by the dilution factor.

VIII. REFERENCES

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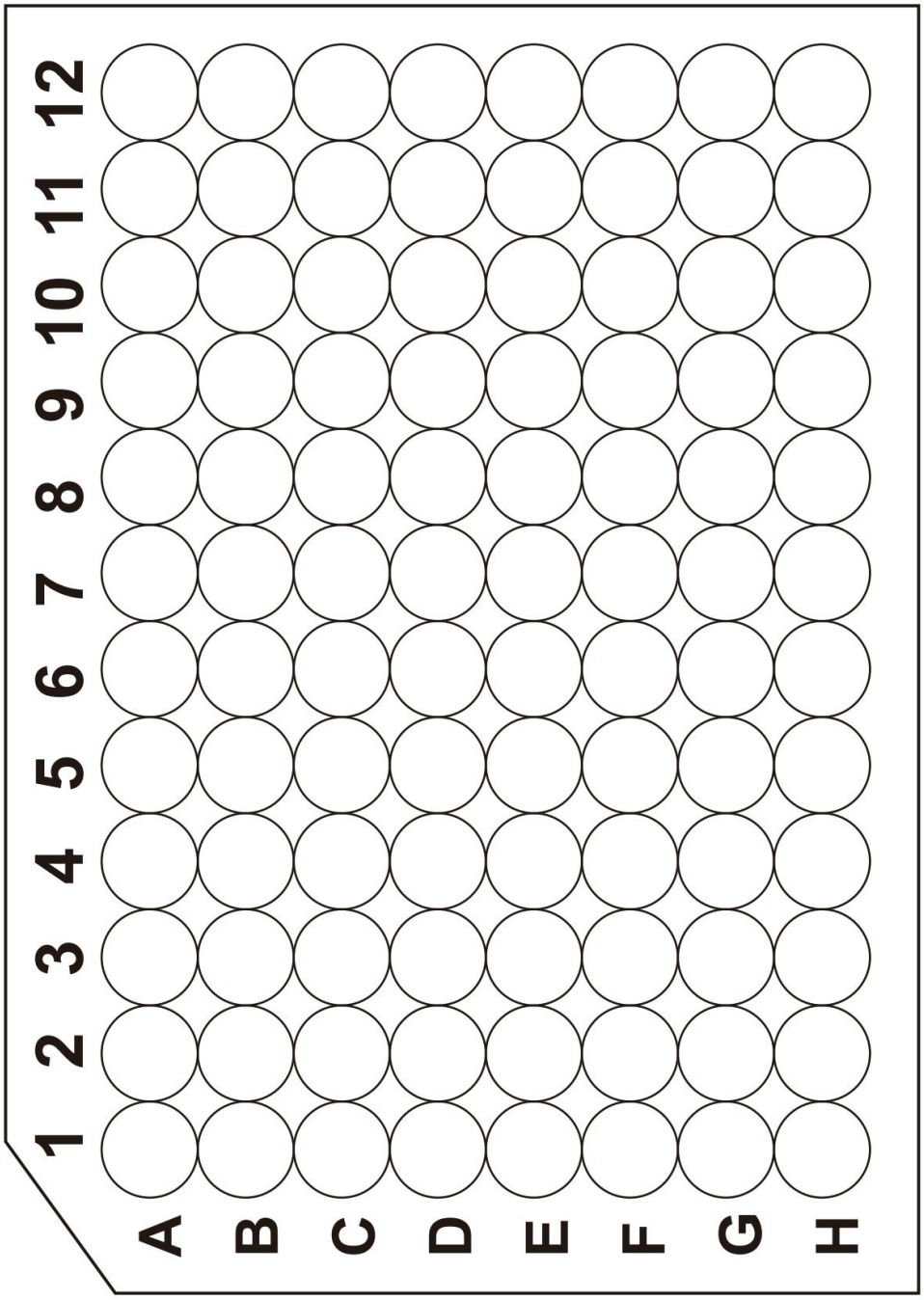
PLATE LAYOUT

Use this plate layout to record standards and samples assayed.



产品信息及操作手册

人 TGF-β1 Valukine™ ELISA 试剂盒

目录号：VAL127

适用于定量检测天然和重组人 TGF-β1 的浓度

科研专用，不可用于临床诊断

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Novus 试剂盒确保在你收货日期 3 个月内有效

版本号 202401.4

目录

I. 背景

人TGF-β1是25kDa的，二硫键连接的同型二聚体蛋白，参与了许多重要的发育、免疫和稳态过程 (1-4)。传统的高亲和性受体TGF-β1是由跨膜丝氨酸/苏氨酸激酶组成的复杂异构体。涉及两种类型：一种结构性磷酸化，配体结合80 kDa糖蛋白，称为TβRII；另一种信号转导，非配体结合55 kDa糖蛋白，称为TβRI/ALK-5 (5-8)。

TGF-β1应用广泛。免疫反应中，小鼠和人中的TGF-β1优先通过诱导IgA生产来影响抗体生产 (9)。它还通过改变趋化因子受体的表达来调节树突状细胞的趋化性 (10)；且可以通过抑制巨噬细胞活性和促炎因子的分泌来降低炎症反应 (11)；在伤口愈合时，TGF-β1从活化的血小板中释放，这种局部来源的TGF-β1对成纤维细胞有明显刺激作用，诱发基质合成；对单核细胞，它诱导促炎介质和生长因子的分泌；对角质形成细胞，它可能通过下调自身的信号通路而促进角质形成细胞的增殖 (12)。最后，TGF-β1在软骨内骨化上可能起着一定作用,其缺失导致卵黄囊血管生成和造血功能的严重缺陷 (13, 14)。

II. 概述

A. 检测原理

本实验采用双抗体夹心 ELISA 法。抗人 TGF-β1 捕获抗体包被于微孔板上，经过孵育，样品和标准品中的 TGF-β1 会与固定在板上的抗体结合，游离的成分被洗去；接着加入生物素化的抗人 TGF-β1 检测抗体进行孵育，洗涤去除未结合的物质后，加入链霉亲和素标记的辣根过氧化物酶 (streptavidin-HRP) 孵育。洗涤后，加入 TMB 底物溶液（显色剂），避光显色。溶液颜色与结合的目标蛋白成正比；加入终止液；用酶标仪测定吸光度。

B. 检测局限

- **仅供科研使用，不可用于体外诊断；**
- 该试剂盒适用于细胞培养上清样本和血清样本；
- 请在试剂盒有效期内使用；
- 不同试剂盒及不同批号试剂盒的组分不能混用；
- 样本值若大于标准曲线的最高值，应将样本用试剂稀释液 1（1×）稀释后重新检测；
- 检测结果的不同可由多种因素引起，包括实验人员的操作、移液器的使用方式、洗板技术、反应时间或温度、试剂盒的效期等。

III. 优势

A. 精确度

板内精确度（同一板内不同孔间的精确度）

已知浓度的三个样本，在同一板内分别检测 20 次，以确定板内精确度。

板间精确度（不同板之间的精确度）

已知浓度的三个样本，在不同板中分别检测 20 次，以确定板间精确度。

	板内精确度			板间精确度		
样本	1	2	3	1	2	3
平均值（pg/mL）	61.7	214.1	917.0	61.1	211.6	888.8
标准差	1.4	5.8	37.5	0.4	2.9	27.1
CV%	2.3	2.7	4.1	3.8	1.4	3.0

B. 回收率

在细胞培养基中掺入检测范围内不同水平的人 TGF-β1，测定其回收率。回收率范围在 105.8-116.0%，平均回收率在 109.9%。

在血清样本中掺入检测范围内不同水平的人 TGF-β1，测定其回收率。回收率范围在 82.7-94.4%，平均回收率在 89.5%。

C. 灵敏度

人 TGF-β1 的最低可测剂量（MDD）一般小于 5.21 pg/mL。

MDD 是根据 20 个重复的零标准品孔的吸光度值的平均值加两倍标准差计算得到的相对应浓度。

D. 校正

此 ELISA 试剂盒经由 R&D Systems®生产的 CHO 表达的高纯度重组人 TGF-β1 蛋白所校正。

E. 线性

不同的细胞上清/人血清中掺入高浓度的人 TGF-β1，然后用试剂稀释液 1（1×）将样本稀释到检测范围内，测定其线性。

稀释倍数	平均期待值（%）	范围（%）
1:2	103.1	91.3-117.3
1:4	103.3	88.0-118.1
1:8	103.6	84.6-126.2
1:16	102.7	80.1-129.6

F. 样本值

使用本试剂盒检测了 6 份人血清样本中 TGF-β1 的水平。6 份样本的检测值在 23.0-31.4 ng/mL，平均值为 26.5 ng/mL。

G. 特异性

对下列因素进行了测定，表现出以下交叉反应性：

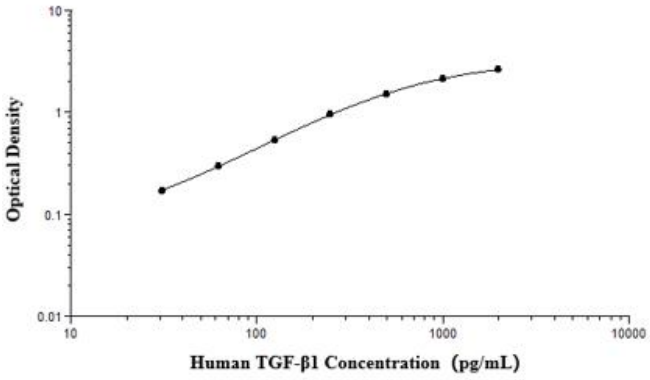
因素	浓缩试验（pg/mL）	测定值（pg/mL）	交叉反应
pTGF-β2	50,000	145	0.3%
rhTGF-β1.2	2500	1421	57%
rhTGF-β2	50,000	74	0.15%
rhTGF-β3	50,000	481	0.96%
raTGF-β5	50,000	904	1.8%

重组人 Latent TGF-β1 蛋白样本值 25 ng/mL 读取值为 37.4 pg/mL（0.15%交叉反应）。

IV. 实验

标准曲线实例

该标准曲线数据仅供参考，每次实验应绘制其对应的标准曲线。



pg/mL	OD	Average	Corrected
0	0.019	0.019	-
	0.018		
31.25	0.172	0.169	0.151
	0.166		
62.5	0.294	0.296	0.278
	0.298		
125	0.546	0.539	0.520
	0.531		
250	0.955	0.949	0.931
	0.943		
500	1.546	1.514	1.495
	1.481		
1000	2.173	2.155	2.137
	2.137		
2000	2.649	2.617	2.598
	2.584		

V. 试剂盒组成及储存

A. 试剂盒组成

组成	描述	规格
Human TGF-β1 Microplate	包被小鼠抗人 TGF-β1 抗体的 96 孔聚苯乙烯板，8 孔×12 条	1 块板
Human TGF-β1 Standard	标准品（冻干粉），参考瓶标签进行重溶	2 瓶
Human TGF-β1 Detection Antibody	生物素化的 TGF-β1 检测抗体，冻干粉，参考瓶标签进行重溶	1 瓶
Streptavidin-HRP B (40×)	40×浓缩的链霉亲和素标记的 HRP	1 瓶
Reagent Diluent Concentrate 1	浓缩的试剂稀释液 1（稀释后使用），用于稀释样本、HRP 和标准品	1 瓶
Detection Antibody Diluent Concentrate (5×)	浓缩的检测抗体稀释液（5×）用于稀释检测抗体	1 瓶
1 N HCl	样本活化液	1 瓶
1.2 N NaOH/0.5M HEPES	样本活化液	1 瓶
Wash Buffer Concentrate (25×)	浓缩洗涤缓冲液（25 ×）	2 瓶
TMB Substrate	TMB ELISA 底物溶液	1 瓶
Stop Solution	终止液	1 瓶
Plate Sealers	封板膜	3 张

B. 试剂盒储存

<table>
<tr><td>未开封试剂盒</td><td colspan="2">2-8℃储存；请在试剂盒有效期内使用</td></tr>
<tr><td rowspan="9">已打开，稀释或重溶的试剂</td><td>链霉亲和素-HRP B</td><td rowspan="6">2-8℃储存，最多 30 天*</td></tr>
<tr><td>洗涤缓冲液（1×）</td></tr>
<tr><td>TMB 底物溶液</td></tr>
<tr><td>终止液</td></tr>
<tr><td>1N HCl</td></tr>
<tr><td>1.2N NaOH/0.5M HEPES</td></tr>
<tr><td>标准品</td><td>使用时新鲜配制*</td></tr>
<tr><td>检测抗体</td><td>分装，-20℃储存，最多 30 天*</td></tr>
<tr><td>浓缩的试剂稀释液 1</td><td>2-8℃储存，最多 30 天*
请每次使用新鲜配制的 1×稀释液，多余的丢弃</td></tr>
<tr><td>检测抗体稀释液（5×）</td><td>2-8℃储存，最多 30 天*
请每次使用新鲜配制的 1×检测抗体稀释液，多余的丢弃</td></tr>
<tr><td>包被的微孔板条</td><td>将未用的板条放回带有干燥剂的铝箔袋内，密封：
2-8℃储存，最多 30 天*</td></tr>
</table>

*必须在试剂盒有效期内

C. 实验所需自备试验器材

- 酶标仪（可测量 450 nm 检测波长的吸收值及 540 nm 或 570 nm 校正波长的吸收值）
- 高精度加液器及一次性吸头
- 蒸馏水或去离子水
- 洗瓶（喷瓶）、多通道洗板器或自动洗板机
- 用来稀释标准品的试管
- 100 mL 及 500 mL 量筒

D. 注意事项

- 试剂盒中的一些组分含有防腐剂，可能引起皮肤过敏反应，避免吸入。
- 试剂盒中的终止液是酸性溶液，使用时请穿戴防护手套、衣服、眼镜和脸的保护罩。使用后请彻底洗手。

VI. 实验前准备

A. 样品收集及储存

细胞培养上清液：颗粒物应离心去除；立刻检测样本。样本收集后若不及时检测，需按一次使用量分装，冻存于-20℃冰箱内，避免反复冻融。样本可能需要用试剂稀释液 1（1×）稀释。

血清样本: 用血清分离管(SST)分离血清。使血样室温凝集30分钟，然后1000 × g离心15分钟。吸取血清样本之后即刻用于检测，或者分装，-20℃贮存备用。避免反复冻融。样本可能需要用试剂稀释液1（1×）稀释。

B. 样本活化

活化后的TGF-β1在其免疫系统中可被检测，依据活化步骤如下表。检测样本需经过中和反应（pH 7.2-7.6），**使用聚丙烯试管**。

细胞培养上清液	**血清**
100 µL 细胞培养上清液中加入20 µL 的1 N HCl.	40 µL 的血清中加入20 µL的1 N HCl.
混匀	混匀
室温孵育10 min.	室温孵育10 min.
加入20 µL的1.2 N NaOH/0.5 M HEPES中和酸化样本.	加入20 µL的1.2 N NaOH/0.5 M HEPES中和酸化样本.
混匀	混匀
立刻检测	检测样本前使用建议试剂稀释液1（1×）稀释
读取样本，需要乘以稀释倍数1.4	样本检测需乘以合适的稀释倍数*

***活化后的血清样本在使用前2-8℃可保存最多24小时，活化后的细胞培养上清样本必须立刻检测。不可冷冻活化样本。**

C. 样本准备工作

细胞上清样本建议用活化后1.4倍稀释后进行检测，活化后的细胞上清样本即为1.4倍立刻检测。最佳稀释度应由最终用户确定。

*血清样本活化后建议用试剂稀释液1（1×）至少50倍稀释后进行检测，例如：20 µL活化血清样本 + 980 µL试剂稀释液（最终的稀释倍数是100倍）。最佳稀释度应由最终用户确定。

D. 检测前准备工作

使用前请将所有试剂放置于室温。

洗涤液：从冰箱中取出的浓缩洗涤液可能有结晶，属于正常现象；放置室温，轻摇混匀，待结晶完全溶解后再配制洗涤液。可将 20 mL 浓缩洗涤液用蒸馏水或去离子水稀释配制成 500 mL 工作浓度的洗涤液。

试剂稀释液 1（1×）：加 1.4 mL 浓缩的试剂稀释液 1 至 98.6 mL 的 1×洗液中，制成 100 mL 试剂稀释液 1（1×）。

检测抗体稀释液（1×）：使用去离子水或蒸馏水稀释配制成检测抗体稀释液（1×）。

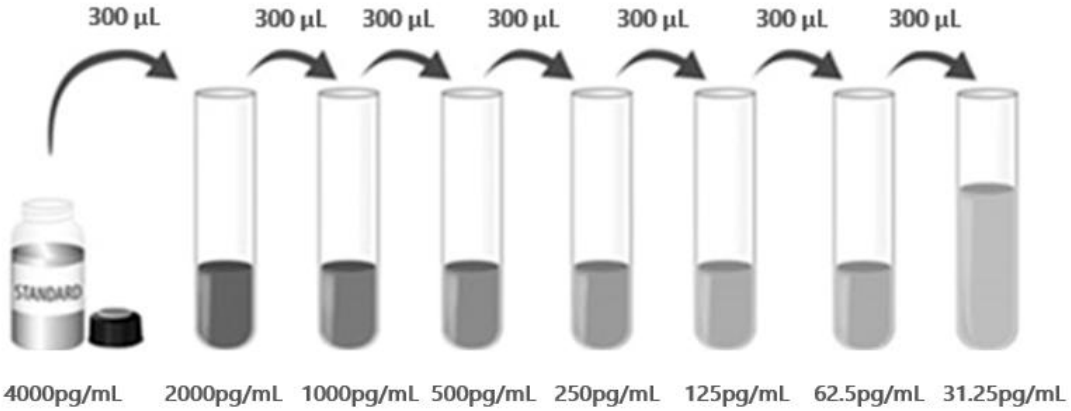
检测抗体（1×）：开盖前请瞬时离心。参考检测抗体瓶标签重溶冻干粉，制备检测抗体（100×）。轻轻震摇至少 15 分钟，其充分溶解。如有需要分装保存。用检测抗体稀释液（1×）稀释至检测抗体（1×），至少在使用前 15 分钟准备。

链霉亲和素- HRP B：开盖前请瞬时离心。用试剂稀释液 1（1×）将链霉亲和素- HRP B（40×）稀释至工作浓度链霉亲和素-HRP B（1×）。

人 TGF-β1 标准品：开盖前请瞬时离心。参照冻干标准品瓶身注明的方式重溶冻干标准品*，得到浓度为 4000 pg/mL 标准品母液。轻微震摇至少 15 分钟，使其充分溶解。

***如有疑问，请咨询我们的技术支持。**

每个稀释管中加入 300 µL 试剂稀释液 1（1×）。将标准品母液参照下图做系列稀释，每管须充分混匀后再移液到下一管。2000 pg/mL 管作标准曲线最高点，试剂稀释液 1（1×）可用作标准品零点（0 pg/mL）。



E. 技术小提示

- 当混合或重溶蛋白液时，尽量避免起沫；
- 为了避免交叉污染，配制不同浓度标准品、上样、加不同试剂都需要更换枪头。另外不同试剂请分别使用不同的移液槽；
- 建议 15 分钟内完成一块板的上样；
- 每次孵育时，正确使用封板膜可保证结果的准确性；
- TMB 底物溶液在上板前应为无色，请避光保存；加入微孔板后，将由无色变成不同深度的蓝色；
- 终止液上板顺序应同 TMB 底物溶液上板顺序一致；加入终止液后，孔内颜色由蓝变黄；若孔内有绿色，则表明孔内液体未混匀，请充分混合。

VII. 操作步骤

使用前请将所有试剂和样本放置于室温，建议所有的实验样本和标准品做复孔检测。

1. 按照上一节的说明，准备好所有需要的试剂和标准品；
2. 从已平衡至室温的密封袋中取出微孔板，未用的板条请放回铝箔袋内，重新封口；
3. 分别将不同浓度标准品，实验样本加入相应孔中，每孔 100 µL。用封板膜封住反应孔，**室温孵育 2 小时**。说明书提供了一张 96 孔模板图，可用于记录标准品和试验样本的板内位置；（样本需要活化和稀释，详情参见样本制备部分。）
4. 将板内液体吸去，使用洗瓶、多通道洗板器或自动洗板机洗板。每孔加洗涤液 400 µL，然后将板内洗涤液吸去。重复操作 3 次，共洗 4 次。每次洗板尽量吸去残留液体会有助于得到好的实验结果。最后一次洗板结束，请将板内所有液体吸干或将板倒置，在吸水纸拍干所有残留液体；
5. 在每个微孔内加入 100 µL 配制好的检测抗体。用封板膜封住反应孔，**室温孵育 2 小时**；
6. 重复第 4 步洗板操作；
7. 在每个微孔内加入 100 µL 稀释好的链霉亲和素- HRP B 工作液。用封板膜封住反应孔，**室温孵育 20 分钟，注意避光**；
8. 重复第 4 步洗板操作；
9. 在每个微孔内加入 100 µL TMB 底物溶液，**室温孵育 20 分钟，注意避光**；
10. 在每个微孔内加入 50 µL 终止液，请轻拍微孔板，使溶液混合均匀；
11. 加入终止液后 10 分钟内，使用酶标仪测量 450 nm 的吸光度值，设定 540 nm 或 570 nm 作为校正波长。如果波长校正不可用，以 450 nm 的读数减去 540 nm 或 570 nm 的读数。这种减法将校正酶标板上的光学缺陷。没有校正而直接在 450 nm 处进行的读数可能会更高且更不准确；
12. **计算结果：**将每个标准品和样品的复孔吸光值取平均值，然后减去零标准品平均 OD 值（O.D.），使用计算机软件作四参数逻辑（4-PL）曲线拟合创建标准曲线。另一替代方法是，通过绘制 y 轴上每个标准品的平均吸光值与 x 轴上的浓度来构建标准曲线，并通过图上的点绘制最佳拟合曲线。数据可以通过绘制人 TGF-β1 浓度的对数与 O.D. 的对数来线性化，并且最佳拟合线可以通过回归分析来确定。该程序将产生足够但不太精确的数据拟合。

    如果样品被稀释，从标准曲线读取的浓度必须乘以稀释倍数。

VIII. 参考文献

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96 孔模板图

请使用 96 孔模板图来记录标准品及样本在板内的位置