

# PRODUCT INFORMATION AND MANUAL

## *human TGF- $\beta$ 1* *Instant ELISA*

**REF** **BMS249INSTCE**

**IVD**

Enzyme-linked immunosorbent assay for quantitative  
detection of human TGF- $\beta$ 1.

For in vitro diagnostic use.

Not for therapeutic procedures.

▽ 128 Tests

**CE**

**human TGF- $\beta$ 1**  
**BMS249INSTCE**



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## TABLE OF CONTENTS

1	Intended Use	4
2	Summary	4
3	Principles of the Test	6
4	Reagents Provided	7
5	Storage Instructions	7
6	Specimen Collection	8
7	Materials Required But Not Provided	9
8	Precautions for Use	10
9	Preparation of Reagents and Samples	12
10	Test Protocol	13
11	Calculation of Results	17
12	Limitations	20
13	Performance Characteristics	21
14	Bibliography	25
15	Ordering Information	29
16	Reagent Preparation Summary	30
17	Test Protocol Summary	31
	<b>PRODUKTINFORMATION UND HANDBUCH (Deutsch)</b>	<b>33</b>
1	Mitgelieferte Reagenzien	33
2	Sicherheitsvorkehrungen für den Gebrauch	34
3	Lagerhinweise	35
4	Vorbereitung der Reagenzien	36
5	Testprotokoll	37
	<b>INFORMACIÓN Y MANUAL DEL PRODUCTO (Español)</b>	<b>40</b>
1	Reactivos Suministrados	40
2	Instrucciones de Conservación	41
3	Preparación de los Reactivos	42
4	Protocolo de Ensayo	43
	<b>INFORMATIONS SUR LE PRODUIT ET MANUEL (Français)</b>	<b>46</b>
1	Réactifs Fournis	46
2	Préparation des Réactifs	48

3	Protocolle de Test	49
	<b>INFORMAZIONI SUL PRODOTTO E MANUALE (italiano)</b>	<b>52</b>
1	Reagenti Forniti	52
2	Istruzioni di Conservazione	53
3	Preparazione Dei Reagenti	54
4	Procedura del Test	55

## 1 Intended Use

The human TGF- $\beta$ 1 Instant ELISA is an enzyme-linked immunosorbent assay for the quantitative detection of human Transforming Growth Factor beta1 levels in cell culture supernatants, human serum, plasma or other body fluids. The human TGF- $\beta$ 1 Instant ELISA is **for in vitro diagnostic use. Not for use in therapeutic procedures.**

## 2 Summary

Transforming growth factor- $\beta$  (TGF- $\beta$ ) belongs to a family of dimeric 25 kDa polypeptides that are ubiquitously distributed in tissues and synthesized by many different cells (13). Three isoforms of transforming Growth Factor- $\beta$  (TGF-beta1, beta-2 and beta-3) exist in mammals. They play critical roles in growth regulation and development. Each isoform is encoded by a unique gene on different chromosomes. All three of these growth factors are secreted by most cell types, generally in a latent form, requiring activation before they can exert biological activity. The TGF-betas possess three major activities: they inhibit proliferation of most cells, but can stimulate the growth of some mesenchymal cells; they exert immunosuppressive effects and they enhance the formation of extracellular matrix. Two types of membrane receptors possessing kinase activity are involved in signal transduction. The TGF-betas are involved in wound repair processes and in starting inflammatory reaction and then in the resolution through chemotactic attraction of inflammatory cells and fibroblast (15).

TGF- $\beta$ 1 is the first recognized transforming growth factor (5), its subunits of each 12.5 kDa are bound via disulphide bridges. TGF- $\beta$ 1 is inhibitive to T- and B cell proliferation as well as to maturation and activation of macrophages. It furthermore inhibits activity of natural killer cells and lymphokine activated killer cells and blocks production of cytokines.

Measurement of TGF- $\beta$ 1 in blood has been advocated for diagnosis of various diseases. TGF- $\beta$ 1 has been shown to be an organizer of responses to neurodegeneration (10).

In this context, it turned out to be interesting in monitoring Alzheimer's disease (18), Down's syndrome, AIDS and Parkinson's disease (11). Serum and cerebrospinal fluid levels of Multiple Sclerosis patients were shown to be of great value to monitor remission and acute phases (4,

21). TGF- $\beta$ 1 is thought to play an important role in bone metabolism (22), it is considered a putative regulator of osteoclastic-osteoblastic interaction, thus it can be regarded as a marker for osteoporosis (14). TGF- $\beta$ 1 is involved in the pathogenesis of glomerular diseases (3, 23) such as diabetic nephropathy and glomerulosclerosis (28). TGF- $\beta$ 1 has been described to be functionally connected to major immune system abnormalities as in autoimmunity (SLE) (8). Serum levels have been shown to correlate with disease activity in autoimmune hepatitis (2). Elevated serum levels of TGF- $\beta$ 1 are determined in Chronic fatigue syndrome patients (6) and in Guillain-Baire syndrome patients (24). An inverse correlation with disease activity was described for TGF- $\beta$ 1 levels in Kawasaki disease (17) and patients with IgA deficiency (19).

TGF- $\beta$ 1 has been confirmed to promote fibrotic processes, thus it is implicated in the myelofibrosis with myeloid metaplasia (16). Increased serum levels of TGF- $\beta$ 1 in patients affected by thrombotic thrombocytopenic purpura implicate its function on bone marrow haematopoiesis (29, 25). Determination of circulating TGF- $\beta$ 1 turned out to reflect the various stages in solid tumors as has been shown for cervical cancer (7), elevations were furthermore found in prostatic cancer (27), bladder cancer (9), and liver cancer (20).

Decreased levels of TGF- $\beta$ 1 in the serum of sepsis and acute stroke patients (1, 12) may reflect the changing immunological-inflammatory status of these patients. Decreased TGF- $\beta$ 1 serum levels were described for patients with acute *Plasmodium falciparum* malaria (26).

### 3 Principles of the Test

An anti-human TGF- $\beta$ 1 monoclonal coating antibody is adsorbed onto microwells. Human TGF- $\beta$ 1 present in the sample or standard binds to antibodies adsorbed to the microwells; an HRP-conjugated monoclonal anti-human TGF- $\beta$ 1 antibody binds to human TGF- $\beta$ 1 captured by the first antibody. Following incubation unbound enzyme conjugated anti-human TGF- $\beta$ 1 is removed during a wash step and substrate solution reactive with HRP is added to the wells.

A coloured product is formed in proportion to the amount of soluble human TGF- $\beta$ 1 present in the sample. The reaction is terminated by addition of acid and absorbance is measured at 450 nm. A standard curve is prepared from seven human TGF- $\beta$ 1 standard dilutions and human TGF- $\beta$ 1 sample concentration determined.

Figure 1

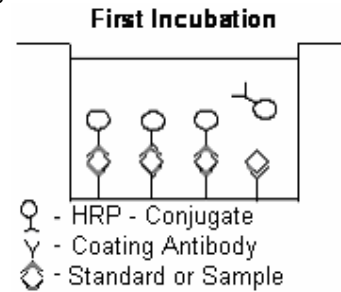


Figure 2

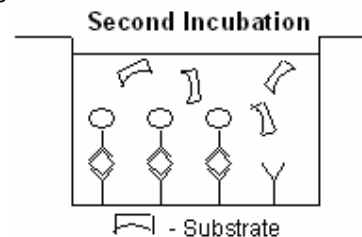
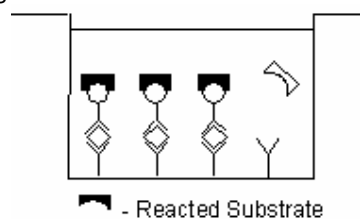


Figure 3



#### 4 Reagents Provided

- 1 aluminium pouch with a **Microwell Plate coated with monoclonal Antibody** (murine) and **HRP-Conjugate** (anti-TGF- $\beta$ 1 monoclonal (murine) antibody), lyophilized
- 2 aluminium pouches with a **human TGF- $\beta$ 1 Standard curve (coloured)**
- 1 bottle (25 ml) **Wash Buffer Concentrate 20x** (phosphate-buffered saline with 1% Tween 20)
- 1 vial (3 ml) 1N **HCl** (pretreatment of samples)
- 1 vial (3 ml) 1N **NaOH** (pretreatment of samples)
- 1 vial (15 ml) **Substrate Solution** (tetramethyl-benzidine)
- 1 vial (5 ml) **Assay Buffer Concentrate 20x** (Use when an external predilution of the samples is needed)
- 1 vial (15 ml) **Stop Solution** (1M Phosphoric acid)
- 2 adhesive **Plate Covers**

#### 5 Storage Instructions

Store ELISA plate and Standard curves or whole kit at  $-20^{\circ}\text{C}$ . The plate and the standard curves can also be removed, stored at  $-20^{\circ}\text{C}$ , remaining kit reagents can be stored between  $2^{\circ}$  and  $8^{\circ}\text{C}$ . Expiry of the kit and reagents is stated on labels.

The expiry of the kit components can only be guaranteed if the components are stored properly, and if, in case of repeated use of one component, the reagent is not contaminated by the first handling.

## 6 Specimen Collection

Cell culture supernatants, human serum, plasma, or other body fluids are suitable for use in the assay. Remove the serum or plasma from the clot or red cells as soon as possible after clotting and separation.

Samples containing a visible precipitate must be clarified prior to use in the assay. Do not use grossly hemolyzed or lipemic specimens.

Samples must be stored frozen at  $-20^{\circ}\text{C}$  to avoid loss of bioactive human TGF- $\beta$ 1. If samples are to be run within 24 hours, they may be stored at  $2^{\circ}$  to  $8^{\circ}\text{C}$  (for sample stability refer to 13).

Avoid repeated freeze-thaw cycles. Prior to assay, frozen serum or plasma should be brought to room temperature slowly and mixed gently.

## 7 Materials Required But Not Provided

- 5 ml and 10 ml graduated pipettes
- 5  $\mu$ l to 1000  $\mu$ l adjustable single channel micropipettes with disposable tips
- 50  $\mu$ l to 300  $\mu$ l adjustable multichannel micropipette with disposable tips
- Multichannel micropipette reservoir
- Beakers, flasks, cylinders necessary for preparation of reagents
- Device for delivery of wash solution (multichannel wash bottle or automatic wash system)
- Microwell strip reader capable of reading at 450 nm (620 nm as optional reference wave length)
- Glass-distilled or deionized water
- Statistical calculator with program to perform linear regression analysis

## 8 Precautions for Use

- All chemicals should be considered as potentially hazardous. We therefore recommend that this product is handled only by those persons who have been trained in laboratory techniques and that it is used in accordance with the principles of good laboratory practice. Wear suitable protective clothing such as laboratory overalls, safety glasses and gloves. Care should be taken to avoid contact with skin or eyes. In the case of contact with skin or eyes wash immediately with water. See material safety data sheet(s) and/or safety statements(s) for specific advice.
- Reagents are intended for in vitro diagnostic use and are not for use in therapeutic procedures.
- Do not mix or substitute reagents with those from other lots or other sources.
- Do not use kit reagents beyond expiration date on label.
- Do not expose kit reagents to strong light during storage or incubation.
- Do not pipette by mouth.
- Do not eat or smoke in areas where kit reagents or samples are handled.
- Avoid contact of skin or mucous membranes with kit reagents or specimens.
- Rubber or disposable latex gloves should be worn while handling kit reagents or specimens.
- Avoid contact of substrate solution with oxidizing agents and metal.
- Avoid splashing or generation of aerosols.
- In order to avoid microbial contamination or cross-contamination of reagents or specimens which may invalidate the test use disposable pipette tips and/or pipettes.
- Use clean, dedicated reagent trays for dispensing substrate reagent.

- Glass-distilled water or deionized water must be used for reagent preparation.
- Substrate solution must be at room temperature prior to use.
- Decontaminate and dispose specimens and all potentially contaminated materials as they could contain infectious agents. The preferred method of decontamination is autoclaving for a minimum of 1 hour at 121.5°C.
- Liquid wastes not containing acid and neutralized waste may be mixed with sodium hypochlorite in volumes such that the final mixture contains 1.0% sodium hypochlorite. Allow 30 minutes for effective decontamination. Liquid waste containing acid must be neutralized prior to the addition of sodium hypochlorite.

## 9 Preparation of Reagents and Samples

### 9.1 Wash Buffer

If crystals have formed in the Wash Buffer Concentrate, warm it gently until they have completely dissolved.

Pour entire contents (25 ml) of the Wash Buffer Concentrate into a clean 500 ml graduated cylinder. Bring to final volume to 500 ml with glass-distilled or deionized water. Mix gently to avoid foaming. The pH of the final solution should adjust to 7.4.

Transfer to a clean wash bottle and store at 2° to 25°C. Please note that Wash Buffer is stable for 30 days.

### 9.2 Assay Buffer

Pour the entire contents (5ml) of the **Assay Buffer Concentrate** into a clean 100 ml graduated cylinder. Bring to final volume of 100 ml with distilled water. Mix gently.

## 10 Test Protocol

- **Use plate immediately after removal from -20°C!**
  - **Do not wait until pellets have completely dissolved before applying samples - the binding reaction in the standard strips starts immediately after addition of water!**
  - **Do not try to dissolve pellets by pipetting up and down in the wells - some parts of the pellet could stick to the tip creating high variation of results**
  - **Perform the washing step with at least 400 µl of washing buffer as stated in the manual or fill the wells completely - otherwise any pellet residues sticking to the rim of the well will not be removed and create high variation of results**
  - **Allow the washing buffer to sit in the wells for a few seconds before aspiration**
  - **Remove covers of the standard strips carefully in order that all the lyophilised pellets remain in the wells**
- a. Prepare your samples before starting with the test procedure. Dilute serum, plasma and cell culture samples 1:10 with Assay Buffer (180 µl Assay Buffer + 20 µl sample). Add 20 µl 1N HCl to 200 µl of prediluted sample, mix and incubate for 1 hour at room temperature. Neutralize by addition of 20 µl 1N NaOH (this results in a 1:12 dilution of the samples).
  - b. Determine the number of Microwell Strips required to test the desired number of samples plus Microwell Strips for blanks and standards (coloured). Each sample, standard, blank, and optional control sample should be assayed in duplicate. Remove extra Microwell Strips from holder and store in foil bag with the desiccant provided at -20°C sealed tightly. Place microwell strips containing the standard curve in position A1/A2 to H1/H2 (see Table 1).
  - c. Add 50 µl of distilled water to the sample wells.
  - d. Add distilled water to all standard and blank wells as indicated on the label of the standard strips (A1, A2 to H1, H2).

Table 1

Table depicting an example of the arrangement of blanks, standards and samples in the microwell strips:

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>A</b>	Standard 1 (30.00 ng/ml)	Standard 1 (30.00 ng/ml)	Sample 1	Sample 1
<b>B</b>	Standard 2 (15.00 ng/ml)	Standard 2 (15.00 ng/ml)	Sample 2	Sample 2
<b>C</b>	Standard 3 (7.50 ng/ml)	Standard 3 (7.50 ng/ml)	Sample 3	Sample 3
<b>D</b>	Standard 4 (3.75 ng/ml)	Standard 4 (3.75 ng/ml)	Sample 4	Sample 4
<b>E</b>	Standard 5 (1.88 ng/ml)	Standard 5 (1.88 ng/ml)	Sample 5	Sample 5
<b>F</b>	Standard 6 (0.94 ng/ml)	Standard 6 (0.94 ng/ml)	Sample 6	Sample 6
<b>G</b>	Standard 7 (0.47 ng/ml)	Standard 7 (0.47 ng/ml)	Sample 7	Sample 7
<b>H</b>	Blank	Blank	Sample 8	Sample 8

- e. Add 100  $\mu$ l of each **pretreated Sample**, in duplicate, to the designated wells and mix the contents.
- f. Cover with a **Plate Cover** and incubate at room temperature (18°C to 25°C) for 4 hours, if available on a microplate shaker at 100 rpm.
- g. Remove **Plate Cover** and empty wells. Wash the microwell strips 3 times with approximately 400  $\mu$ l Wash Buffer per well with thorough aspiration of microwell contents between washes. Take care not to scratch the surface of the microwells.

After the last wash, tap microwell strips on absorbent pad or paper towel to remove excess Wash Buffer. Use the microwell strips immediately after washing or place upside down on a wet absorbent paper for no longer than 15 minutes. Do not allow wells to dry.

- h. Pipette 100  $\mu$ l of **TMB Substrate Solution** to all wells, including the blank wells.
- i. Incubate the microwell strips at room temperature (18° to 25°C) for about 10 minutes. Avoid direct exposure to intense light.

**The colour development on the plate should be monitored and the substrate reaction stopped (see point j. of this protocol) before positive wells are no longer properly recordable.**

It is recommended to add the stop solution when the highest standard has developed a dark blue colour.

Alternatively the colour development can be monitored by the ELISA reader at 620 nm. The substrate reaction should be stopped as soon as the standard 1 has reached an OD of 0.6 – 0.65.

- j. Stop the enzyme reaction by quickly pipetting 100  $\mu$ l of **Stop Solution** into each well, including the blank wells. It is important that the Stop Solution is spread quickly and uniformly throughout the microwells to completely inactivate the enzyme. Results must be read immediately after the Stop Solution is added or within one hour if the microwell strips are stored at 2 - 8°C in the dark.
- k. Read absorbance of each microwell on a spectro-photometer using 450 nm as the primary wave length (optionally 620 nm as the reference wave length; 610 nm to 650 nm is acceptable). Blank the plate reader according to the manufacturer's instructions by using the

blank wells. Determine the absorbance of both the samples and the human TGF- $\beta$ 1 standards.

## 11 Calculation of Results

- Calculate the average absorbance values for each set of duplicate standards and samples. Duplicates should be within 20 per cent of the mean.
- Create a standard curve by plotting the mean absorbance for each standard concentration on the ordinate against the human TGF- $\beta$ 1 concentration on the abscissa. Draw a best fit curve through the points of the graph.
- To determine the concentration of circulating human TGF- $\beta$ 1 for each sample, first find the mean absorbance value on the ordinate and extend a horizontal line to the standard curve. At the point of intersection, extend a vertical line to the abscissa and read the corresponding human TGF- $\beta$ 1 concentration.
- **\*Samples have been diluted 1:12, thus the concentration read from the standard curve must be multiplied by the dilution factor (x 12).**
- It is suggested that each testing facility establishes a control sample of known human TGF- $\beta$ 1 concentration and runs this additional control with each assay. If the values obtained are not within the expected range of the control, the assay results may be invalid.
- A representative standard curve is shown in Figure 4. This curve cannot be used to derive test results. Every laboratory must prepare a standard curve for each group of microwell strips assayed.

\* N.B: There is a common dilution factor for samples due to the conjugate which must then be included in the calculation. The samples contribute 100  $\mu$ l to the final volume per well. These 100  $\mu$ l are composed of 100  $\mu$ l of the 1:12 prediluted sample. This is a 1:12 dilution.

The remaining 50  $\mu$ l to give 150  $\mu$ l are due to the addition of 50  $\mu$ l conjugate to all wells.

Figure 4

Representative standard curve for human TGF- $\beta$ 1 Instant ELISA. Human TGF- $\beta$ 1 was diluted in serial 2-fold steps in Assay Buffer, each symbol represents the mean of 3 parallel titrations. Do not use this standard curve to derive test results. A standard curve must be run for each group of microwell strips assayed.

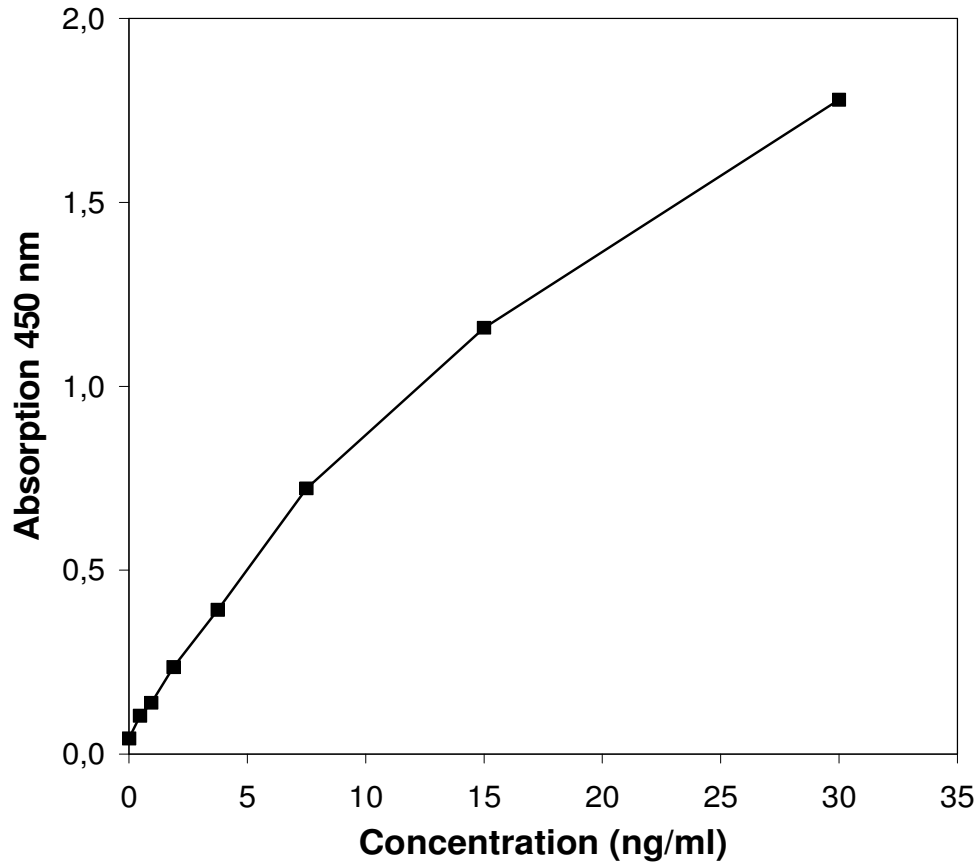


Table 2

Typical data using the human TGF- $\beta$ 1 INSTANT ELISA

Measuring wavelength: 450 nm

Reference wavelength: 620 nm

Standard	human TGF- $\beta$ 1		O.D. Mean	C.V. (%)
	Concentration (ng/ml)	O.D. (450 nm)		
1	30.00	1.776	1.779	2.0
	30.00	1.782		
2	15.00	1.156	1.159	2.6
	15.00	1.161		
3	7.50	0.689	0.722	7.0
	7.50	0.754		
4	3.75	0.398	0.392	3.3
	3.75	0.386		
5	1.88	0.229	0.236	6.6
	1.88	0.242		
6	0.94	0.143	0.139	3.2
	0.94	0.135		
7	0.47	0.103	0.104	3.1
	0.47	0.104		
Blank	0	0.046	0.042	
	0	0.037		

## 12 Limitations

- Since exact conditions may vary from assay to assay, a standard curve must be established for every run.
- Bacterial or fungal contamination of either screen samples or reagents or cross-contamination between reagents may cause erroneous results.
- Disposable pipette tips, flasks or glassware are preferred, reusable glassware must be washed and thoroughly rinsed of all detergents before use.
- Improper or insufficient washing at any stage of the procedure will result in either false positive or false negative results. Empty wells completely before dispensing fresh wash solution, fill with Wash Buffer as indicated for each wash cycle and do not allow wells to sit uncovered or dry for extended periods.
- The use of radioimmunotherapy has significantly increased the number of patients with human anti-mouse IgG antibodies (HAMA). HAMA may interfere with assays utilizing murine monoclonal antibodies leading to both false positive and false negative results. Serum samples containing antibodies to murine immunoglobulins can still be analysed in such assays when murine immunoglobulins (serum, ascitic fluid, or monoclonal antibodies of irrelevant specificity) are added to the Sample.

## **13 Performance Characteristics**

### **13.1 Sensitivity**

The limit of detection of human TGF- $\beta$ 1 defined as the analyte concentration resulting in an absorbance significantly higher than that of the dilution medium (mean plus 2 standard deviations) was determined to be 0.1 ng/ml (mean of 6 independent assays).

### **13.2 Reproducibility**

#### **13.2.1 Intra-assay**

Reproducibility within the assay was evaluated in 3 independent experiments. Each assay was carried out with 6 replicates of 8 serum samples containing different concentrations of human TGF- $\beta$ 1. 2 standard curves were run on each plate. Data below show the mean human TGF- $\beta$ 1 concentration and the coefficient of variation for each sample (see Table 3). The calculated overall intra-assay coefficient of variation was 4.6%.

Table 3

The mean human TGF- $\beta$ 1 concentration and the coefficient of variation for each sample.

Positive Sample	Experiment	human TGF- $\beta$ 1 Concentration (ng/ml)	Coefficient of Variation (%)
1	1	112	8
	2	102	3
	3	103	4
2	1	175	6
	2	151	3
	3	143	6
3	1	143	5
	2	125	5
	3	126	5
4	1	119	4
	2	104	4
	3	97	2
5	1	120	4
	2	106	3
	3	102	6
6	1	103	5
	2	88	4
	3	94	1
7	1	53	5
	2	46	3
	3	46	4
8	1	112	9
	2	94	6
	3	93	6

### 13.2.2 Inter-assay

Assay to assay reproducibility within one laboratory was evaluated in 3 independent experiments by 3 technicians. Each assay was carried out with 6 replicates of 8 serum samples containing different concentrations of human TGF- $\beta$ 1. 2 standard curves were run on each plate. Data below (see Table 4) show the mean human TGF- $\beta$ 1 concentration and the coefficient of variation calculated on 18 determinations of each sample. The calculated overall coefficient of variation was 8.7%.

Table 4

The mean human TGF- $\beta$ 1 concentration and the coefficient of variation calculated on 18 determinations of each sample.

Sample	human TGF- $\beta$ 1 Concentration (ng/ml)	Coefficient of Variation (%)
1	105	5.1
2	156	10.8
3	131	7.6
4	107	10.7
5	109	8.9
6	95	7.7
7	48	8.1
8	100	10.9

### 13.3 Spike Recovery

The spike recovery was evaluated by spiking 4 levels of human TGF- $\beta$ 1 into human serum. Recoveries were determined in 3 independent experiments with 6 replicates each. The unspiked serum was used as blank in these experiments. Average recovery ranged from 92% to 126% with an overall mean recovery of 109%.

### **13.4 Dilution Parallelism**

4 serum samples with different levels of human TGF- $\beta$ 1 were analysed at serial 2 fold dilutions with 4 replicates each. The recovery ranged between between 85% and 125% with an overall recovery of 110%.

### **13.5 Sample Stability**

#### **13.5.1 Freeze-Thaw Stability**

Aliquots of serum samples (unspiked or spiked) were stored at -20 °C and thawed 5 times, and the human TGF- $\beta$ 1 levels determined. There was no significant loss of human TGF- $\beta$ 1 immunoreactivity by freezing and thawing.

#### **13.5.2 Storage Stability**

Aliquots of serum samples (spiked or unspiked) were stored at -20 °C, 2-8 °C, room temperature (RT) and at 37 °C, and the human TGF- $\beta$ 1 level determined after 24 h. There was no significant loss of human TGF- $\beta$ 1 immunoreactivity during storage under above conditions.

### **13.6 Specificity**

The assay detects both natural and recombinant human TGF- $\beta$ 1. To define the specificity of this ELISA several proteins were tested for cross reactivity. There was no cross reactivity observed, notably not for TGF $\beta$ -2 and TGF $\beta$ -3.

## 14 Bibliography

- 1) Astiz M, Saha D, Lustbader D, Lin R, Rackow E. Monocyte response to bacterial toxins, expression of cell surface receptors, and release of anti-inflammatory cytokines during sepsis. *J Lab Clin Med* 1996 Dec;128(6):594-600.
- 2) Bayer EM, Herr W, Kanzler S, Waldmann C, Meyer Zum Buschenfelde KH, Diense HP; Lohse AW. Transforming growth factor-beta1 in autoimmune hepatitis: correlation of liver tissue expression and serum levels with disease activity. *J Hepatol* 1998 May;28(5):803-811.
- 3) Border WA. Transforming growth factor-beta and the pathogenesis of glomerular diseases. *Curr Opin Nephrol Hypertens* 1994 Jan;3(1):54-58.
- 4) Carrieri PB, Provitera V, Bruno R, Perrella M, Tartaglia G, Busto A, Perrella O. Possible role of transforming growth factor-beta in relapsing-remitting multiple sclerosis. *Neurol Res* 1997 Dec;19(6):599-600.
- 5) Chambaz EM, Souchelnitskiy S, Pellerin S, Defaye G, Cochet C, Feige JJ. Transforming growth factors-beta s: a multifunctional cytokine family. Implication in the regulation of adrenocortical cell endocrine functions. *Horm Res* 1996;45(3-5):222-226.
- 6) Chao CC, Janoff EN, Hu SX, Thomas K, Gallagher M, Tsang M, Peterson PK. Altered cytokine release in peripheral blood mononuclear cell cultures from patients with the chronic fatigue syndrome. *Cytokine* 1991 Jul;3(4):292-298.
- 7) Chopra V, Dinh TV, Hannigan EV. Circulating serum levels of cytokines and angiogenic factors in patients with cervical cancer. *Cancer Invest* 1998;16(3):152-159.
- 8) Del Giudice G, Crow MK. Role of transforming growth factor beta (TGF beta) in systemic autoimmunity. *Lupus* 1993 Aug;2(4):213-220.
- 9) Eder IE, Stenzl A, Hobisch A, Cronauer MV, Bartsch G, Klocker H. Expression of transforming growth factors beta-1, beta 2 and beta 3 in human bladder carcinomas. *Br J Cancer* 1997;75(12):1753-1760.

- 10) Finch CE, Laping NJ, Morgan TE, Nichols NR, Pasinetti GM. TGF-beta 1 is an organizer of responses to neurodegeneration. *J Cell Biochem* 1993 Dec;53(4):314-322.
- 11) Flanders KC, Ren RF, Lippa CF. Transforming growth factor-betas in neurodegenerative disease. *Prog Neurobiol* 1998 Jan;54(1):71-85.
- 12) Kim JS, Yoon SS, Kim YH, Ryu JS. Serial measurement of interleukin-6, transforming growth factor-beta, and S-100 protein in patients with acute stroke. *Stroke* 1996 Sep;27(9):1553-1557.
- 13) Kropf J, JO Schurek, A Wollner, and AM Gressner. Immunological measurement of transforming growth factor-beta I (TGF-b1) in blood; assay development and comparison. *Clinical Chemistry* 1997;43(10):1965-1974.
- 14) Langdahl BL, Knudsen JY, Jensen HK, Gregersen N, Eriksen EF. A sequence variation: 713-8delC in the transforming growth factor-beta 1 gene has higher prevalence in osteoporotic women than in normal women and is associated with very low bone mass in osteoporotic women and increased bone turnover in both osteoporotic and normal women. *Bone* 1997 Mar;20(3):289-294.
- 15) Lawrence DA. Transforming growth factor-beta: a general review. *Eur Cytokine Netw* 1996 Sep;7(3):363-374.
- 16) Martyre MC, Magdelenat H, Bryckaert MC, Laine-Bidron C, Calvo F. Increased intraplatelet of platelet-derived growth factor and transforming growth factor-beta in patients with myelofibrosis with myeloid metaplasia. *Br J Haematol* 1991 Jan;77(1):80-86.
- 17) Matsubara T, Umezawa Y, Tsuru S, Motohashi T, Yabuta K, Furukawa S. Decrease in the concentrations of transforming growth factor-beta 1 in the sera of patients with Kawasaki disease. *Scand J Rheumatol* 1997;26(4):314-317.
- 18) Mattson MP, Barger SW, Furukawa K, Bruce AJ, Wyss-Coray T, Mark RJ, Mucke L. Cellular signaling roles of TGF beta, TNF alpha and beta APP in brain injury responses and Alzheimer's disease. *Brain Res Rev* 1997 Feb;23(1-2):47-61.

- 19) Muller F, Aukrust P, Nilssen DE, Froland SS. Reduced serum level of transforming growth factor-beta in patients with IgA deficiency. *Clin Immunol Immunopathol* 1995 Aug;76(2):203-208.
- 20) Murawaki Y, Ikuta Y, Nishimura Y, Koda M, Kawasaki H. Serum markers for fibrosis and plasma transforming growth factor-beta 1 in patients with hepatocellular carcinoma in comparison with patients with liver cirrhosis. *J Gastroenterol Hepatol* 1996 May;11(5):443-450.
- 21) Ossege LM, Sindern E, Voss B, Malin JP. Corticosteroids induce expression of transforming-growth-factor-beta1 mRNA in peripheral blood mononuclear cells of patients with multiple sclerosis. *J Neuroimmunol* 1998 Apr 1;84(1):1-6.
- 22) Pfeilschifter J, Diel I, Scheppach B, Bretz A, Krempien R, Erdmann J, Schmid G, Reske N, Bismar H, Seck T, Krempien B, Ziegler R. Concentration of transforming growth factor beta in human bone tissue: relationship to age, menopause, bone turnover, and bone volume. *J Bone Miner Res* 1998 Apr;13(4):716-730.
- 23) Shankland SJ, Johnson RJ. TGF-beta in glomerular disease. *Miner Electrolyte Metab* 1998;24(2-3):168-173.
- 24) Sindern E, Schweppe K, Ossege LM, Malin JP. Potential role of transforming growth factor-beta 1 in terminating the immune response in patients with Guillain-Barre syndrome. *J Neurol* 1996 Mar;243(3):264-268.
- 25) Tornquist SJ, Oaks JL, Crawford TB. Elevation of cytokines associated with the thrombocytopenia of equine infectious anaemia. *J Gen Virol* 1997 Oct;78(Pt 10):2541-2548.
- 26) Wenisch C, Parschalk B, Burgmann H, Looareesuwan S, Graninger W. Decreased serum levels of TGF-beta in patients with acute *Plasmodium falciparum* malaria. *J Clin Immunol* 1995 Mar;15(2):69-73.
- 27) Wolff JM, Fandel T, Borchers H, Brehmer B Jr, Jakse G. Transforming growth factor-beta 1 serum concentration in patients with prostatic cancer and benign prostatic hyperplasia. *Br J Urol* 1998 Mar;81(3):403-405.

- 28) Yokoyama H, Deckert T. Central role of TGF-beta in the pathogenesis of diabetic nephropathy and macrovascular complications: a hypothesis. *Diabet Med* 1996 Apr;13(4):313-320.
- 29) Zauli G, Gugliotta L, Catani L, Vianelli N, Borgatti P, Belmonte MM, Tura S. Increased serum levels of transforming growth factor beta-1 in patients affected by thrombotic thrombocytopenic purpura (TTP): its implications on bone marrow haematopoiesis. *Br J Haematol* 1993 Jul;84(3):381-386.

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**Cat.No. BMS249INSTCE human TGF- $\beta$ 1 INSTANT ELISA**

## **16 Reagent Preparation Summary**

### **16.1 Wash Buffer**

Add **Wash Buffer Concentrate** 20 x (25 ml) to 475 ml distilled water

### **16.2 Assay Buffer**

Add **Assay Buffer Concentrate** 20 x (5 ml) to 95 ml distilled water

## 17 Test Protocol Summary

- Predilute sample with Assay Buffer 1:10, pretreat sample with HCl and NaOH
- Place standard strips in position A1/A2 to H1/H2.
- Add 50 µl **distilled water** to sample wells.
- Add **distilled water**, in duplicate, to all standard and blank wells as indicated on the label of the standard strips.
- Add 100 µl **pretreated Sample** to designated wells.
- Cover microwell strips and incubate 4 hours at room temperature (18° to 25°C) if available on a microplate shaker at 100 rpm.
- Empty and wash microwell strips 3 times with 400 µl **Wash Buffer**.
- Add 100 µl of **TMB Substrate Solution** to all wells including blank wells.
- Incubate the microwell strips for about 10 minutes at room temperature (18° to 25°C).
- Add 100 µl **Stop Solution** to all wells including blank wells.
- Blank microwell reader and measure colour intensity at 450 nm.

**Note: Samples have been diluted 1:12, thus the concentration read from the standard curve must be multiplied by the dilution factor (x 12).**



# PRODUKTINFORMATION UND HANDBUCH (Deutsch)

## 1 Mitgelieferte Reagenzien

- 1 Aluminiumbeutel mit Mikrotiterplatte, beschichtet mit monoklonalem Antikörper (von der Maus) gegen humanes TGF- $\beta$ 1 und HRP-Konjugat (monoklonaler Anti-TGF- $\beta$ 1 Antikörper von der Maus), lyophilisiert.
- 2 Aluminiumbeutel mit einer human TGF- $\beta$ 1-Standardkurve (farbig)
- 1 Flasche (25 ml) Waschpufferkonzentrat 20x (PBS mit 1% Tween 20)
- 1 Fläschchen (3 ml) 1N HCl (Probenvorbehandlung)
- 1 Fläschchen (3 ml) 1N NaOH (Probenvorbehandlung)
- 1 Fläschchen (15 ml) Substratlösung (Tetramethylbenzidin)
- 1 Fläschchen (5 ml) Verdünnungslösung Konzentrat 20x (Verwendung zur Vorverdünnung von Proben)
- 1 Fläschchen (15 ml) Stopplösung (1 M Phosphorsäure)
- 2 Klebefolien

## 2 Sicherheitsvorkehrungen für den Gebrauch

- Alle enthaltenen Reagenzien sollten als potenziell gefährlich betrachtet werden. Daher wird empfohlen, dass dieses Produkt nur von Personen mit labortechnischer Erfahrung und in Übereinstimmung mit GLP Richtlinien verwendet wird. Passende Schutzbekleidung, wie Labormäntel, Sicherheitsbrillen und Laborhandschuhe müssen getragen werden. Vermeiden Sie jeden Kontakt der Reagenzien mit Haut oder Augen. Im Falle des Kontaktes von Reagenzien mit Haut oder Augen, sofort mit Wasser spülen. Bitte entnehmen Sie weitere spezifische Hinweise den Sicherheitsdatenblättern und/oder den Sicherheitsbestimmungen.
- Die Reagenzien sind ausschließlich für Diagnosezwecke bestimmt und nicht für den Einsatz bei Therapien.
- Reagenzien aus verschiedenen Chargen oder anderer Herkunft nicht mischen oder untereinander austauschen.
- Verwenden Sie die Kitreagenzien nicht nach dem Ablaufdatum (siehe Etikett).
- Setzen Sie die Kitreagenzien während der Lagerung oder Inkubation keiner starken Lichteinstrahlung aus.
- Nicht mit dem Mund pipettieren.
- In Bereichen, in denen mit Kitreagenzien oder Proben hantiert wird, nicht essen, trinken oder rauchen.
- Vermeiden Sie den Kontakt der Haut/Schleimhäute mit Kitreagenzien/Proben.
- Tragen Sie während des Hantierens mit Kitreagenzien oder Proben geeignete Gummi- oder Einweghandschuhe.
- Vermeiden Sie den Kontakt zwischen Substratlösung und Oxidationsmitteln/Metallen.
- Vermeiden Sie Spritzer oder Bildung von Aerosolen.
- Zur Vermeidung von Kontamination mit Mikroben oder Kreuzkontamination der Reagenzien oder Proben, die den Test

ungültig machen könnten, verwenden Sie Einwegpipettenspitzen und/oder Einwegpipetten.

- Verwenden Sie saubere, geeignete Reagenzgefäße für das Dispensieren von Konjugat und Substratreagenzien.
- Säureeinwirkung inaktiviert das Konjugat.
- Für die Reagenzherstellung muss destilliertes oder entionisiertes Wasser verwendet werden.
- Die Substratlösung muss vor der Verwendung auf Raumtemperatur gebracht werden.
- Dekontaminieren und entsorgen Sie Proben sowie alle möglicherweise kontaminierten Materialien so, als ob sie Infektionserreger enthalten könnten. Die bevorzugte Dekontaminationsmethode ist Autoklavieren für mind. eine Stunde bei 121,5°C.
- Flüssige Abfälle, die kein Säure enthalten, sowie neutralisierte Abfälle werden zur Dekontamination mit Natrium Hypochlorit versetzt (Endkonzentration von Natrium Hypochlorit 1.0%). Nach 30 min ist eine effektive Dekontamination erreicht. Flüssige Abfälle, die Säure enthalten, müssen vor der Dekontamination neutralisiert werden.

### **3 Lagerhinweise**

Lagern Sie die ELISA Platte und Standardkurven oder den ganzen Kit bei –20°C. Die Platte und Standardkurven können auch herausgenommen und bei –20°C gelagert werden, die verbleibenden Reagenzien können bei 2-8°C gelagert werden. Das Ablaufdatum des Kits und der Reagenzien ist auf den Etiketten angegeben. Haltbarkeit des Kits und der Komponenten kann nur bei sachgemäßer Lagerung garantiert werden, sowie bei mehrfacher Verwendung nur dann, wenn die Reagenzien bei der ersten Verwendung nicht kontaminiert wurden.

## **4 Vorbereitung der Reagenzien**

### **4.1 Waschpuffer**

Sollten sich im Waschpufferkonzentrat Kristalle gebildet haben, erwärmen Sie es vorsichtig bis zur vollständigen Auflösung der Kristalle.

Leeren Sie den gesamten Inhalt (25 ml) des Waschpufferkonzentrats in einen sauberen 500-ml-Messzylinder. Füllen Sie mit destilliertem oder entionisiertem Wasser auf, bis ein Endvolumen von 500 ml erreicht ist. Vorsichtig mischen, um Schäumen zu vermeiden. Der pH-Wert der Endlösung sollte bei 7,4 liegen.

In eine saubere Waschflasche umfüllen und bei 2° bis 25 °C lagern. Bitte beachten Sie, dass der Waschpuffer 30 Tage haltbar ist.

### **4.2 Verdünnungslösung**

Leeren Sie den gesamten Inhalt (5 ml) der Verdünnungslösung in einen sauberen 100-ml-Messzylinder. Füllen Sie mit destilliertem oder entionisiertem Wasser auf, bis ein Endvolumen von 100 ml erreicht ist. Vorsichtig mischen.

## 5 Testprotokoll

- **Verwenden Sie die Platte sofort nach Entnahme von -20°C!**
  - **Warten Sie mit dem Auftragen der Proben nicht bis zur vollständigen Auflösung der Lyophilisate – die Bindereaktion in den Standardstreifen beginnt sofort nach Beigabe von Wasser!**
  - **Versuchen Sie nicht, die Lyophilisate mittels Auf- und Abpipettieren in den Vertiefungen aufzulösen – Teile des Lyophilisats könnten dabei an der Spitze hängen bleiben und starke Abweichungen der Ergebnisse bewirken.**
  - **Führen Sie den Waschschrift mit mind. 400 µl Waschpuffer durch wie in der Anleitung beschrieben, oder füllen Sie die Vertiefungen vollständig – andernfalls werden allfällige Lyophilisatrückstände am Rand der Vertiefung nicht entfernt und bewirken starke Abweichungen der Ergebnisse.**
  - **Entfernen Sie die Abdeckungen der Standardstreifen vorsichtig, sodass alle Lyophilisate in den Vertiefungen bleiben.**
- a. Bereiten Sie Ihre Proben vor, bevor Sie mit dem Protokoll beginnen. Verdünnen Sie Serum, Plasma und Zellkulturüberstände 1:10 mit Verdünnungslösung (180µl Verdünnungslösung + 20 µl Probe). Geben Sie 20 µl 1N HCl zu 200 µl vorverdünnter Probe, mischen und inkubieren Sie für 1 Stunde bei Raumtemperatur. Neutralisieren Sie durch Zugabe von 20 µl 1N NaOH. Dadurch sind die Proben 1:12 vorverdünnt.
- b. Bestimmen Sie die Anzahl der **Mikrowellstreifen** die für das Testen der gewünschten Anzahl von Proben benötigt werden sowie die **Mikrowellstreifen** für Blindproben und Standards (**farbig**). Probe, Standard, Blindprobe und optionale Kontrollprobe immer jeweils doppelt testen. Entfernen Sie die zusätzlichen **Mikrowellstreifen** von der Halterung und bewahren Sie diese mit dem mitgelieferten Trockenmittel in dem Folienbeutel fest verschlossen bei -20°C auf. Bringen Sie die Mikrowellstreifen mit der Standardkurve in Position A1/A2 bis H1/H2 (siehe Table 5).
- c. Pipettieren Sie in alle Probenvertiefungen 50 µl destilliertes Wasser.
- d. Pipettieren Sie destilliertes Wasser in alle Standardvertiefungen und Blindprobenvertiefungen wie auf dem Etikett der Standardstreifen angegeben (A1, A2 bis H1, H2).

Table 5

Diagramm mit Beispiel für die Anordnung von Blindproben, Standards und Proben in den Mikrowellstreifen:

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>A</b>	Standard 1 (30.00 ng/ml)	Standard 1 (30.00 ng/ml)	Probe 1	Probe 1
<b>B</b>	Standard 2 (15.00 ng/ml)	Standard 2 (15.00 ng/ml)	Probe 2	Probe 2
<b>C</b>	Standard 3 (7.50 ng/ml)	Standard 3 (7.50 ng/ml)	Probe 3	Probe 3
<b>D</b>	Standard 4 (3.75 ng/ml)	Standard 4 (3.75 ng/ml)	Probe 4	Probe 4
<b>E</b>	Standard 5 (1.88 ng/ml)	Standard 5 (1.88 ng/ml)	Probe 5	Probe 5
<b>F</b>	Standard 6 (0.94 ng/ml)	Standard 6 (0.94 ng/ml)	Probe 6	Probe 6
<b>G</b>	Standard 7 (0.47 ng/ml)	Standard 7 (0.47 ng/ml)	Probe 7	Probe 7
<b>H</b>	Blindprobe	Blindprobe	Probe 8	Probe 8

- e. Pipettieren Sie je **100 µl von jeder vorbehandelten Probe** (Doppelbestimmung) in die Probenvertiefungen und mischen Sie den Inhalt durch.
- f. Mit einer **Klebefolie** abdecken und bei Raumtemperatur (18° bis 25°C) für 4 Stunden inkubieren, wenn möglich auf einem Schüttler bei 100 U/min.
- g. Entfernen Sie die **Klebefolie** und entleeren Sie die Vertiefungen  
Waschen Sie die Mikrowellstreifen 3 mal mit ca. **400 µl Waschpuffer** pro Vertiefung; zwischen den Waschgängen den Inhalt der Vertiefungen gründlich absaugen. Achten Sie darauf, die Oberfläche der Vertiefungen nicht zu zerkratzen.

- h. Leeren Sie die Vertiefungen nach dem letzten Waschschrift und klopfen Sie die Mikrowellstreifen auf einem Saug- oder Papiertuch aus, um überschüssigen Waschpuffer zu entfernen. Verwenden Sie die Mikrowellstreifen sofort nach dem Waschen, oder legen Sie diese für maximal 15 Minuten umgedreht auf ein nasses Saugtuch. Lassen Sie die Vertiefungen nicht austrocknen
- i. Pipettieren Sie in alle Vertiefungen, einschließlich der Blindprobenvertiefungen, 100  $\mu$ l **TMB-Substratlösung**.
- j. Inkubieren Sie die Mikrowellstreifen bei Raumtemperatur (18° bis 25°C) für ca. 10 Minuten. Vermeiden Sie direkte, starke Lichteinstrahlung. Die Farbentwicklung innerhalb der einzelnen Vertiefungen muss beobachtet und die Substratreaktion gestoppt werden, bevor die gefärbten wells nicht mehr richtig gemessen können. Es wird empfohlen, die Stopplösung zuzugeben, wenn der höchste Standardpunkt eine dunkelblaue Farbe angenommen hat. Alternativ kann die Farbentwicklung auch mit einem Photometer bei 620 nm verfolgt werden. Die Substratreaktion sollte gestoppt werden, wenn der höchste Standardpunkt eine OD von 0,6-0,65 erreicht.
- k. Stoppen Sie die Enzymreaktion durch rasches Pipettieren von 100  $\mu$ l Stopplösung in jede Vertiefung, einschließlich der Blindprobenvertiefungen. Für eine vollständige Inaktivierung der Enzyme ist es wichtig, die Stopplösung rasch und gleichmäßig in die Vertiefungen zu verteilen. Die OD Werte müssen sofort nach Beigabe der Stopplösung oder innerhalb einer Stunde nach Lagerung der Mikrowellstreifen in Dunkelheit bei 2-8°C gemessen werden.
- l. Messen Sie die Absorption jeder Vertiefung mit einem Spektrophotometer, verwenden Sie dabei 450 nm als primäre Wellenlänge (optional 620 nm als Referenzwellenlänge; 610 nm bis 650 nm sind möglich). Stellen Sie das Plattenmessgerät nach Anleitung des Herstellers und unter Verwendung der Blindprobenvertiefungen auf den Leerwert ein Bestimmen Sie die Absorption der Proben wie auch der human TGF- $\beta$ 1-Standards.

# INFORMACIÓN Y MANUAL DEL PRODUCTO (Español)

## 1 Reactivos Suministrados

- 1 bolsa de aluminio con una placa de pocillos recubiertos con anticuerpos monoclonales (murinos) anti-TGF- $\beta$ 1 humano y conjugado HRP [anticuerpos (murinos) monoclonales anti-TGF- $\beta$ 1], liofilizado
- 2 bolsas de aluminio con una curva de valoración human TGF- $\beta$ 1 (en color)
- 1 frasco (25 ml) de concentrado de tampón de lavado 20x (PBS con Tween 20 al 1%)\*
- 1 vial (3 ml) de HCl 1N (pretratamiento de las muestras)
- 1 vial (3 ml) de NaOH 1N (pretratamiento de las muestras)
- 1 vial (15 ml) de solución de sustrato (tetrametil-bencidina)
- 1 vial (5 ml) de diluyente de muestras 20x
- 1 vial (15 ml) de solución de parada (ácido fosfórico 1M)
- 2 tapas para placas, adhesives

## 2 Instrucciones de Conservación

Conservar la placa de ELISA o el kit completo a  $-20^{\circ}\text{C}$ . También se puede sacar la placa para conservarla a  $-20^{\circ}\text{C}$  y conservar los demás reactivos del kit a una temperatura comprendida entre  $2$  y  $8^{\circ}\text{C}$ . En las etiquetas figuran las fechas de caducidad del kit y de los reactivos. Sólo se podrá garantizar la fecha de caducidad de los componentes del *kit* si se conservan adecuadamente y, en caso de uso reiterado de un mismo componente, si el reactivo no queda contaminado en la primera manipulación.

### **3 Preparación de los Reactivos**

#### **3.1 Tampón de lavado**

Si en el concentrado de tampón de lavado se han formado cristales, caliente suavemente hasta su completa disolución.

Vierta todo el contenido (25 ml) del Concentrado de tampón de lavado en un matraz aforado de 500 ml limpio. Enrase en matraz con agua destilada o desionizada. Mezcle suavemente para evitar la formación de espuma. Ajuste el pH de la solución final a 7,4.

Transfiera la solución a un frasco de lavado limpio y consérvela a una temperatura entre 2 °C y 25 °C. El Tampón de lavado permanece estable durante 30 días.

#### **3.2 Diluyente de muestras**

Vierta todo el contenido (5 ml) del diluyente de muestras en un matraz aforado de 100 ml limpio. Enrase en matraz con agua destilada o desionizada. Mezcle suavemente.

#### 4 Protocolo de Ensayo

- **Utilice la placa inmediatamente después de extraerla del congelador a -20 °C**
  - **Al aplicar las muestras, no espere a la disolución total de las microcápsulas ya que la reacción de unión a las tiras de patrón se inicia inmediatamente después de añadir el agua.**
  - **No intente disolver las microcápsulas pipeteando por los pocillos ya que algunas partes de las microcápsulas podrían quedar adheridas a la punta y alterar considerablemente los resultados**
  - **En la etapa de lavado, emplee al menos 400 µl de tampón de lavado como se indica en el manual o llene los pocillos totalmente ya que, de lo contrario, podrían quedar restos de microcápsulas en los bordes de los pocillos que alterarían considerablemente los resultados**
  - **Retire las tapas de las tiras de patrón con cuidado para que todas las microcápsulas liofilizadas permanezcan en los pocillos**
- a. Prepare las muestras antes de iniciar el ensayo. Diluya las muestras de suero, plasma y cultivo celular en tampón de dilución 1:10 (180 µl de tampón de trabajo + 20 µl de muestra). Añada 20 µl de HCl 1N a 200 µl de muestra prediluida, mézclelo e incúbelo durante 1 hora a temperatura ambiente. Neutralícelo añadiendo 20 µl de NaOH 1N.
  - b. Determine el número de tiras necesarias para analizar el número deseado de muestras y además añada las **tiras** para blancos y patrones (**de color**). Todas las muestras, patrones, blancos y las posibles muestras de control deben ser analizadas por duplicado. Retire del soporte las **tiras** sobrantes y consérvelas, junto con el desecante suministrado en una bolsa metalizada y cerrada herméticamente, a una temperatura de -20° C. Coloque las tiras que contienen la curva de valoración en las posiciones A1/A2 a H1/H2 (véase la Table 6).
  - c. Añada 50 µl de agua destilada a los pocillos con muestras.
  - d. Añada agua destilada a los pocillos del patrón y del blanco como se indica en la etiqueta de las tiras de patrón (A1, A2 a H1, H2).

- e. Por duplicado, añada 100  $\mu$ l de cada **muestra** a los pocillos designados y mezcle los contenidos.

Table 6

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>A</b>	Patrón 1 (30.00 ng/ml)	Patrón 1 (30.00 ng/ml)	Muestra 1	Muestra 1
<b>B</b>	Patrón 2 (15.00 ng/ml)	Patrón 2 (15.00 ng/ml)	Muestra 2	Muestra 2
<b>C</b>	Patrón 3 (7.50 ng/ml)	Patrón 3 (7.50 ng/ml)	Muestra 3	Muestra 3
<b>D</b>	Patrón 4 (3.75 ng/ml)	Patrón 4 (3.75 ng/ml)	Muestra 4	Muestra 4
<b>E</b>	Patrón 5 (1.88 ng/ml)	Patrón 5 (1.88 ng/ml)	Muestra 5	Muestra 5
<b>F</b>	Patrón 6 (0.94 ng/ml)	Patrón 6 (0.94 ng/ml)	Muestra 6	Muestra 6
<b>G</b>	Patrón 7 (0.47 ng/ml)	Patrón 7 (0.47 ng/ml)	Muestra 7	Muestra 7
<b>H</b>	blanco	blanco	Muestra 8	Muestra 8

- f. Cubra la **placa con una tapa** e incúbela a temperatura ambiente (18 °C - 25 °C) durante 4 horas (en un agitador mecánico a 100 rpm, si es posible).
- g. Retire la **tapa** y vacíe los pocillos. Lave 3 veces las tiras con aproximadamente 400  $\mu$ l de tampón de lavado por cada pocillo, aspirando completamente el contenido de los pocillos entre cada lavado. Evite rayar la superficie de los pocillos.

- h. Tras el último lavado, golpee suavemente las tiras contra un papel absorbente o una toallita de papel para eliminar el exceso de tampón de lavado. Utilice las tiras inmediatamente después de lavadas o bien colóquelas boca abajo sobre un papel absorbente húmedo durante como máximo 15 minutos. No deje secar los pocillos.
- i. Pipetee 100  $\mu$ l de **solución de sustrato TMB** y viértalos en todos los pocillos, incluidos los del blanco.
- j. Incube las tiras a temperatura ambiente (18 °C - 25 °C) durante aproximadamente 10 minutos. Evite la exposición directa a la luz intensa. **Deben monitorizarse los valores DO de la placa para detener la reacción del sustrato antes de que deje de ser posible registrar correctamente los pocillos positivos.**  
Se recomienda añadir la solución de parada cuando el estándar más alto presente un color azul oscuro. Alternativamente el desarrollo de color puede ser monitorizado con un lector de placas de ELISA a 620 nm. La reacción del sustrato debería ser parada cuando este estándar alcance una OD entre 0.6 y 0.65.
- k. Detenga la reacción enzimática pipeteando rápidamente 100  $\mu$ l de **solución de parada** en cada pocillo, incluidos los del blanco. Es importante dispensar la solución de parada de forma rápida y uniforme en todos los pocillos para inactivar totalmente la enzima. Los resultados deben leerse inmediatamente después de añadir la solución de parada o, como máximo, en el plazo de 1 hora si las tiras se conservan a una temperatura entre 2 - 8 °C en un lugar oscuro.
- l. Lea la absorbancia de cada pocillo en un espectrofotómetro utilizando 450 nm como longitud de onda principal (opcionalmente 620 nm como longitud de onda de referencia; los valores comprendidos entre 610 nm y 650 nm son aceptables). Utilizando los pocillos de blanco, haga el blanco del lector de placas de acuerdo con las instrucciones del fabricante. Determine la absorbancia de las muestras y de los patrones human TGF- $\beta$ 1.

# INFORMATIONS SUR LE PRODUIT ET MANUEL (Français)

## 1 Réactifs Fournis

- 1 pochette en aluminium contenant une plaque de microtitration recouverte d'anticorps monoclonaux (murins) anti-TGF- $\beta$ 1 humaine et le conjugué HRP (anticorps monoclonaux murins anti-TGF- $\beta$ 1), lyophilisés
- 2 pochettes en aluminium contenant une courbe étalon human TGF- $\beta$ 1 (colorée)
- 1 flacon (25 ml) de tampon de lavage concentré 20 x (tampon phosphate avec du Tween 20 1%)
- 1 flacon (3 ml) de HCl 1 N (traitement préparatoire des échantillons)
- 1 flacon (3 ml) de NaOH 1 N (traitement préparatoire des échantillons)
- 1 flacon (15 ml) de solution de substrat (tétraméthyle-benzidine)
- 1 flacon (5 ml) de diluant d'échantillon 20x
- 2 flacon (15 ml) de solution d'arrêt (acide phosphorique 1 M)
- 2 Couvre-plaques adhésifs

## **2 Instruction de stockage**

Conserver la plaque ELISA ou le kit complet à -20°C. La plaque peut également être retirée pour être conservée à -20°C, le reste du kit étant conservé entre 2 et 8°C. La date de péremption du kit est spécifiée sur les étiquettes.

Le délai de péremption du kit ne peut être garanti que si les composants sont conservés correctement et si, en cas d'utilisation répétée d'un composant, le réactif n'a pas été contaminé lors d'une première utilisation.

### **3 Préparation des Réactifs**

#### **3.1 Tampon de lavage**

Si des cristaux se sont formés dans le concentré de Tampon de lavage, chauffer doucement ce dernier jusqu'à leur dissolution totale.

Verser tout le contenu (25 ml) du Concentré de Tampon de lavage dans un cylindre gradué propre de 500 ml. Porter le volume final à 500 ml avec de l'eau distillée dans un alambic en verre ou désionisée.

Mélanger doucement pour éviter la formation de mousse. Le pH de la solution finale doit être de 7.4.

Transférer le tout dans une bouteille de lavage et conserver à une température comprise entre 2° et 25°C. Noter que le Tampon de lavage reste stable pendant 30 jours.

#### **3.2 Diluant d'échantillon**

Verser tout le contenu (5 ml) du diluant d'échantillon dans un cylindre gradué propre de 100 ml. Porter le volume final à 100 ml avec de l'eau distillée dans un alambic en verre ou désionisée. Mélanger doucement.

#### 4 Protocole de Test

- Utiliser la plaque immédiatement après son retrait d'un environnement à -20 °C !
  - Ne pas attendre que les pastilles soient complètement dissoutes pour appliquer les échantillons. La réaction de liaison dans les barrettes étalons commence immédiatement après l'ajout d'eau !
  - Ne pas essayer de dissoudre les pastilles en pipetant de haut en bas dans les puits. Certains fragments des pastilles pourraient se coller à l'embout et induire une forte variation des résultats.
  - Procéder à l'étape de lavage avec au moins 400 µl de tampon de lavage comme indiqué dans le manuel ou remplir complètement les puits. Dans le cas contraire, tous les résidus de pastilles collés au bord du puits ne seraient pas éliminés et entraîneraient une forte variation des résultats
  - Retirer délicatement les couvre-plaques des barrettes étalons de manière à ce que toutes les pastilles lyophilisées restent dans les puits
- a. Préparer les échantillons avant de lancer la procédure de dosage. Diluer les échantillons de sérum, plasma et culture cellulaire à 1/10 avec le tampon de test (180 µl de tampon de test + 20 µl d'échantillon). Ajouter 20 µl de HCl 1N à 200 µl d'échantillon prédilué, mélanger et incuber pendant une heure à température ambiante. Neutraliser en ajoutant 20 µl de NaOH 1N.
  - b. Déterminer le nombre de barrettes de puits de microtitration nécessaires pour tester le nombre voulu d'échantillons plus les **barrettes** nécessaires aux blancs et aux étalons (**colorés**). Chaque échantillon, étalon, blanc et contrôle (facultatif) doit être testé en double. Retirer les **barrettes de microtitration** inutiles du support et les stocker à -20°C dans une pochette hermétiquement refermée, avec le dessiccatif fourni. Placer les barrettes de puits de microtitration contenant la courbe étalon en position A1/A2 à H1/H2 (voir la Table 7).
  - c. Ajouter 50 µl d'eau distillée dans les puits d'échantillon.
  - d. Ajouter de l'eau distillée comme indiqué sur l'étiquette à tous les puits de standard et "blank" (A1, A2 à H1, H2)

Table 7

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>A</b>	Étalon 1 (30.00 ng/ml)	Étalon 1 (30.00 ng/ml)	Échantillon 1	Échantillon 1
<b>B</b>	Étalon 2 (15.00 ng/ml)	Étalon 2 (15.00 ng/ml)	Échantillon 2	Échantillon 2
<b>C</b>	Étalon 3 (7.50 ng/ml)	Étalon 3 (7.50 ng/ml)	Échantillon 3	Échantillon 3
<b>D</b>	Étalon 4 (3.75 ng/ml)	Étalon 4 (3.75 ng/ml)	Échantillon 4	Échantillon 4
<b>E</b>	Étalon 5 (1.88 ng/ml)	Étalon 5 (1.88 ng/ml)	Échantillon 5	Échantillon 5
<b>F</b>	Étalon 6 (0.94 ng/ml)	Étalon 6 (0.94 ng/ml)	Échantillon 6	Échantillon 6
<b>G</b>	Étalon 7 (0.47 ng/ml)	Étalon 7 (0.47 ng/ml)	Échantillon 7	Échantillon 7
<b>H</b>	Blind Échantillon	Blind Échantillon	Échantillon 8	Échantillon 8

- e. Ajouter 100 µl de chaque **échantillon**, en double, dans les puits assignés et mélanger le contenu.
- f. Recouvrir avec un **couvre-plaque** et incuber à température ambiante (entre 18 et 25 °C) pendant 4 heures, si possible sur un agitateur rotateur réglé à 100 tr/min.
- g. Retirer le **couvre-plaque** et vider les puits. Laver 3 fois les barrettes de puits de microtitration avec environ 400 µl de tampon de lavage pour chaque puits, en aspirant complètement le contenu des puits entre les lavages. Veiller à ne pas rayer la surface des puits de microtitration.
- h. Après le dernier lavage, vider les barrettes de puits et les tapoter sur un tampon absorbant ou une serviette en papier pour éliminer l'excès

de tampon de lavage. Utiliser les barrettes de micropuits immédiatement après le lavage ou les placer renversées sur un papier absorbant pendant 15 minutes au maximum. Ne pas laisser sécher les puits.

- i. Pipeter 100  $\mu$ l de **solution de substrat TMB** dans chaque puits, y compris les puits de blanc.
- g. Incuber les puits de microtitration à température ambiante (entre 18 et 25 C) pendant environ 10 minutes. Éviter toute exposition directe à une source de lumière intense.

**Les valeurs de densité optique au niveau de la plaque doivent être surveillées et la réaction du substrat stoppée avant que les puits positifs ne soient plus correctement mesurables.**

- j. Il est recommandé d'ajouter la solution stop quand une couleur bleu sombre s'est développée dans le point le plus haut de la gamme standard. Une autre alternative consiste à suivre le développement de la couleur en lecteur ELISA à 620 nm. La réaction du substrat doit être arrêtée dès que la DO atteint 0.6 à 0.65
- k. Arrêter la réaction enzymatique en pipetant rapidement 100  $\mu$ l de **solution d'arrêt** dans chaque puits, y compris les puits de blanc. Il est important que la solution d'arrêt soit répandue rapidement et uniformément dans les puits pour inactiver complètement l'enzyme. Les résultats doivent être lus immédiatement après l'ajout de la solution d'arrêt ou dans l'heure qui suit si les barrettes de microtitration sont conservées à l'obscurité entre 2 et 8 °C.
- l. Lire l'absorbance de chaque puits sur un spectrophotomètre avec 450 nm comme longueur d'onde primaire (éventuellement 620 nm comme longueur d'onde de référence; 610 à 650 nm sont acceptables). Mesurer le blanc du lecteur de plaque conformément aux instructions du fabricant, en utilisant les puits de blanc. Déterminer l'absorbance des échantillons et des étalons human TGF- $\beta$ 1.

# INFORMAZIONI SUL PRODOTTO E MANUALE (italiano)

## 1 Reagenti Forniti

- 1 bustina di alluminio contenente una piastra micropozzetti rivestita con anticorpo monoclonale (murino) anti TGF- $\beta$ 1 umano e HRP-coniugato (anticorpo monoclonale (murino) anti-TGF- $\beta$ 1), liofilizzato
- 2 bustine di alluminio ognuna con una curva degli étalon human TGF- $\beta$ 1 (colorata)
- 1 bottiglia (25 ml) con tampone di lavaggio concentrato 20x (soluzione salina tamponata con 1% Tween 20)\*
- 1 flaconcino (3 ml) HCl 1N (pretrattamento dei campioni)
- 1 flaconcino (3 ml) NaOH (pretrattamento dei campioni)
- 1 flaconcino (15 ml) di soluzione del substrato (tetrametilbenzidina)
- 1 flaconcino (5 ml) con diluente campione 20x
- 1 flaconcino (15 ml) di soluzione bloccante (acido fosforico 1M)
- 2 copripietra adesivi

## 2 Istruzioni di Conservazione

Conservare la piastra ELISA e tutto il kit a  $-20^{\circ}\text{C}$ . È possibile rimuovere la piastra e conservarla a  $-20^{\circ}\text{C}$ , mentre i rimanenti reagenti del kit devono essere conservati tra  $2^{\circ}$  e  $8^{\circ}\text{C}$ . La scadenza del kit e dei reagenti è indicata sulle etichette.

La data di scadenza dei componenti del kit può essere garantita solo se questi sono conservati correttamente e, in caso di uso ripetuto di un componente, il reagente non è stato contaminato durante la prima manipolazione.

### **3 Preparazione Dei Reagenti**

#### **3.1 Tampone di lavaggio**

Se il tampone di lavaggio concentrato presenta cristalli in sospensione, riscaldare lievemente il tampone fino a ottenere la completa dissoluzione dei cristalli.

Versare l'intero contenuto (25 ml) del tampone di lavaggio concentrato in un cilindro graduato pulito da 500 ml. Portare il volume finale a 500 ml utilizzando acqua distillata o acqua deionizzata. Mescolare delicatamente per evitare la formazione di schiuma. Il pH della soluzione finale si deve regolare a 7,4.

Trasferire il prodotto in una bottiglia pulita e conservare a temperature comprese fra 2 °C e 25 °C. Il tampone di lavaggio è stabile per 30 giorni.

#### **3.2 Diluente Campione**

Versare l'intero contenuto (5 ml) del diluente campione concentrato in un cilindro graduato pulito da 100 ml. Portare il volume finale a 100 ml utilizzando acqua distillata o acqua deionizzata. Mescolare delicatamente.

#### 4 Procedura del Test

- ~ **Usare la piastra immediatamente dopo la rimozione dall'ambiente refrigerato a -20° C!**
  - ~ **Non attendere la completa dissoluzione dei pellet prima di usare i campioni; la reazione di legame nelle strip degli étalon inizia immediatamente dopo l'aggiunta di acqua!**
  - ~ **Non cercare di dissolvere i pellet pipettando su e giù nei pozzetti; particelle del pellet possono aderire al puntale determinando una notevole variabilità dei risultati.**
  - ~ **Eeguire la fase di lavaggio con almeno 400 µl di tampone di lavaggio come indicato nel manuale o riempire completamente i pozzetti; in caso contrario non sarà possibile rimuovere tutti i residui del pellet adesi al bordo del pozzetto, determinando una notevole variabilità dei risultati.**
  - ~ **Rimuovere con cautela i fogli protettivi delle strip degli étalon per lasciare tutti i pellet liofilizzati nei pozzetti.**
- a. Preparare i campioni prima di avviare la procedura di test. Diluire i campioni di siero, plasma e coltura cellulare 1:10 con soluzione tampone (180 µl soluzione tampone + 20 µl campione). Aggiungere 20 µl di 1N HCl ai 200 µl di campione prediluito, mescolare e incubare per 1 ora a temperatura ambiente. Neutralizzare aggiungendo 20 µl di 1N NaOH.
  - b. Stabilire il numero di strip dei micropozzetti necessarie per analizzare la quantità desiderata di campioni più le **strip** per i blank e gli étalon (**colorate**). Tutti i campioni, gli étalon, il blank e i campioni di controllo opzionali devono essere processati in duplicato. Rimuovere dal supporto le **strip micropozzetti** non utilizzate e conservarle nella bustina metallica contenente la polvere essiccante, mantenendole a -20 °C e perfettamente sigillate. Mettere le strip contenenti la curva étalon nelle posizioni da A1/A2 a H1/H2 (vedere la Table 8).
  - c. Dispensare 50 µl di acqua distillata nei pozzetti dei campioni.
  - d. Dispensare acqua distillata a tutti i pozzetti per lo standard ed il bianco come indicato sull'etichetta degli standard strip (A1, A2 fino a H1, H2)

Table 8

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>A</b>	Standard 1 (30.00 ng/ml)	Standard 1 (30.00 ng/ml)	Campione 1	Campione 1
<b>B</b>	Standard 2 (15.00 ng/ml)	Standard 2 (15.00 ng/ml)	Campione 2	Campione 2
<b>C</b>	Standard 3 (7.50 ng/ml)	Standard 3 (7.50 ng/ml)	Campione 3	Campione 3
<b>D</b>	Standard 4 (3.75 ng/ml)	Standard 4 (3.75 ng/ml)	Campione 4	Campione 4
<b>E</b>	Standard 5 (1.88 ng/ml)	Standard 5 (1.88 ng/ml)	Campione 5	Campione 5
<b>F</b>	Standard 6 (0.94 ng/ml)	Standard 6 (0.94 ng/ml)	Campione 6	Campione 6
<b>G</b>	Standard 7 (0.47 ng/ml)	Standard 7 (0.47 ng/ml)	Campione 7	Campione 7
<b>H</b>	Blind Campione	Blind Campione	Campione 8	Campione 8

e. Dispensare 100  $\mu$ l di ciascun **campione**, in duplicato, nei pozzetti di reazione e mescolare il contenuto.

Coprire con un **copripietra** e incubare a temperatura ambiente

f. (18-25°C) per 4 ore utilizzando, se disponibile, un vortex a 100 rpm.

g. Rimuovere il **copripietra** e svuotare i pozzetti. Lavare 3 volte le strip micropozzetti utilizzando circa 400  $\mu$ l di tampone di lavaggio per pozzetto, aspirando accuratamente il contenuto dei micropozzetti tra un lavaggio e l'altro. Evitare di scalfire la superficie dei micropozzetti.

h. Dopo l'ultimo lavaggio, asciugare le strip micropozzetti con un tampone o carta assorbente per rimuovere il tampone di lavaggio in eccesso. Utilizzare le strip subito dopo il lavaggio o sistemarle

capovolte su carta assorbente umida per non più di 15 min. Non lasciar asciugare i pozzetti.

- i. Pipettare 100 µl di **soluzione substrato TMB** in tutti i pozzetti, inclusi quelli del blank.
- j. Incubare le strip a temperatura ambiente (18-25° C) per circa 10 minuti. Evitare l'esposizione diretta a luci intense. **È necessario monitorare i valori O.D. a livello della piastra e interrompere la reazione del substrato prima che i pozzetti positivi cessino di essere appropriatamente registrabili.**  
Si raccomanda di aggiungere la soluzione di stop quando lo standard più elevato ha sviluppato un colore blu scuro.  
Alternativamente lo sviluppo del colore può essere monitorato con un lettore ELISA a 620 nm. La reazione del substrato deve essere bloccata non appena viene misurato un valore delle OD di 0.6 - 0.65.
- k. Interrompere la reazione enzimatica pipettando rapidamente 100 µl di **soluzione bloccante** in ciascun pozzetto, inclusi i pozzetti del blank. È importante che la soluzione bloccante si diffonda rapidamente e uniformemente attraverso i micropozzetti per inattivare completamente l'enzima. I risultati devono essere letti immediatamente dopo l'aggiunta della soluzione bloccante o entro 1 ora se le strip sono conservate in un luogo buio a 2-8° C.
- l. Leggere l'assorbanza di ciascun micropozzetto su uno spettrofotometro che utilizza 450 nm come lunghezza d'onda primaria (620 nm come lunghezza d'onda di riferimento alternativa; valori da 610 nm a 650 nm sono accettabili). Azzerare il lettore della piastra secondo le istruzioni del produttore e utilizzando i pozzetti del blank. Determinare l'assorbanza sia dei campioni, sia degli étalon di human TGF-β1.