Mouse/Rat IGF-I ELISA

Cat. No.: RMEE25R

PACKAGE INSERT ENGLISH

- is suited for IGF-I determination in serum of **mice and rats**
- is **fast**: incubation time a total of 2 hours
- Single Standards with **0.5, 2.5, 6, 12, 18 ng/ml** recombinant IGF-I are provided in the Kit
- 2 Control Sera are provided for quality control
- uses **high affinity antibodies** against m/r IGF-I
- Microtiter plates are separately breakapart

INTRODUCTION

Beside different cell culture models and studies with human patients, mice and rats are suitable model organisms for basic research and pre-clinical studies.Thus, we developed this test system as a tool for IGF-I measurements in mice and rat for usage in research and preclinical studies. Even if the comparability of mice and humans is limited we offer some background information on the *human* IGF-I system in the following section: Insulin-like growth factors (IGF) I and II play a pivotal role in regulating the proliferation and differentiation of many cell types (1-3). IGF-I is identical with Somatomedin C (Sm-C) (4) and has a molecular weight of 7649 daltons (5). Its major regulators are growth hormone (GH) and nutrition (6). In contrast to many other peptide hormones, IGFs are avidly bound to specific binding proteins (IGFBP). The seven IGFBPs which are known at present (7,8,22) either bind IGF-I and IGF-II with similar affinities or show a preference for IGF-II (9,10).

A major problem of IGF-I measurement results from the interference of IGFBPs in the assay. Direct determinations in untreated serum samples (11) give false values because of the extremely slow dissociation of the IGF-I/IGFBP-3 complexes during the assay incubation. Depending on the ratio IGF-I to IGFBP in the sample interference comes up (see example Figure 1):

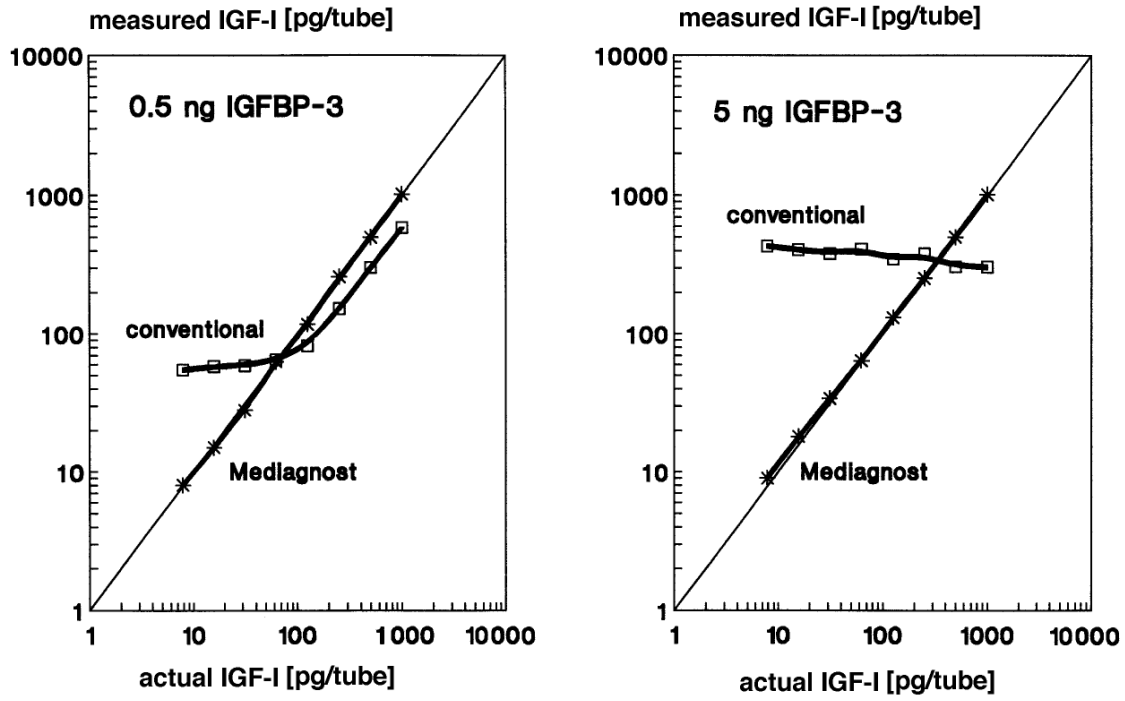


Figure 1. Interference of IGFBP in IGF-I measurements. Known concentrations of IGF-I were assayed in the presence of 0.5 ng (left) or 5 ng (right) hIGFBP-3 by a conventional (□)and by the IGFBP-blocked assay (*).

Therefore, various techniques were applied to physically separate IGF-I from its binding proteins before measurement, including (a) size exclusion chromatography under acidit conditions, (b) solid-phase extraction and (c) acid-ethanol extraction (2,12,13). These techniques, however, are either inconvenient or time-consuming or give incomplete and notreproducible recoveries. The most widely used method is the acid-ethanol extraction (13,14) with a recovery of only 70-80 % of IGFBP-bound IGF-I as a result of co-precipitation. The absolute results of such an extraction are therefore false low (15). The extraction removes the IGFBPs only insufficiently and leads to reduction in sensitivity of the assay due to predilution of the samples by the extraction procedure. Furthermore, the remaining IGFBP may still interfere in the assay. In addition, the acid-ethanol extraction is ineffective in specimen other than serum or plasma (e.g. cell culture media), in which determination of IGF-I is already difficult enough due to the fact that IGFBPs are frequently present at large excess. To avoid these difficulties, an uncomplicated assay was developed, in which special sample preparation is not required before measurement.

INTENDED USE

Measurement of IGF-I in serum of mice and rats.

PERFORMANCE CHARACTERISTICS AND VALIDATION

Standards

The Standards of the ELISA are prepared from **recombinant IGF-I** in concentrations of **0.5, 2.5, 6, 12, 18 ng/mL**.

Sensitivity

The analytical sensitivity of the ELISA yields < 0.029 ng/mL

Inter-Assay-Variability

	Mean Value	Standard Deviation	VC %	n
Sample 1	471	24.81	5.3	10
Sample 2	744	41.8	5.6	10
Sample 3	347	5.6	6.72	16

Intra-Assay- Variability

	Mean Value	Standard Deviation	VC %	n
Sample 1	165	8.0	4.9	10
Sample 2	794	47	5.9	10
Sample 3	514	22	4.2	10

Linearity

Dilution: ng/ml	Probe 1	Probe 2
1:50	261	888
1:75	332	909
1:100	315	980
1:200	281	960
1:400	290	994
1:600	298	997
1:800	325	983

Method Comparison

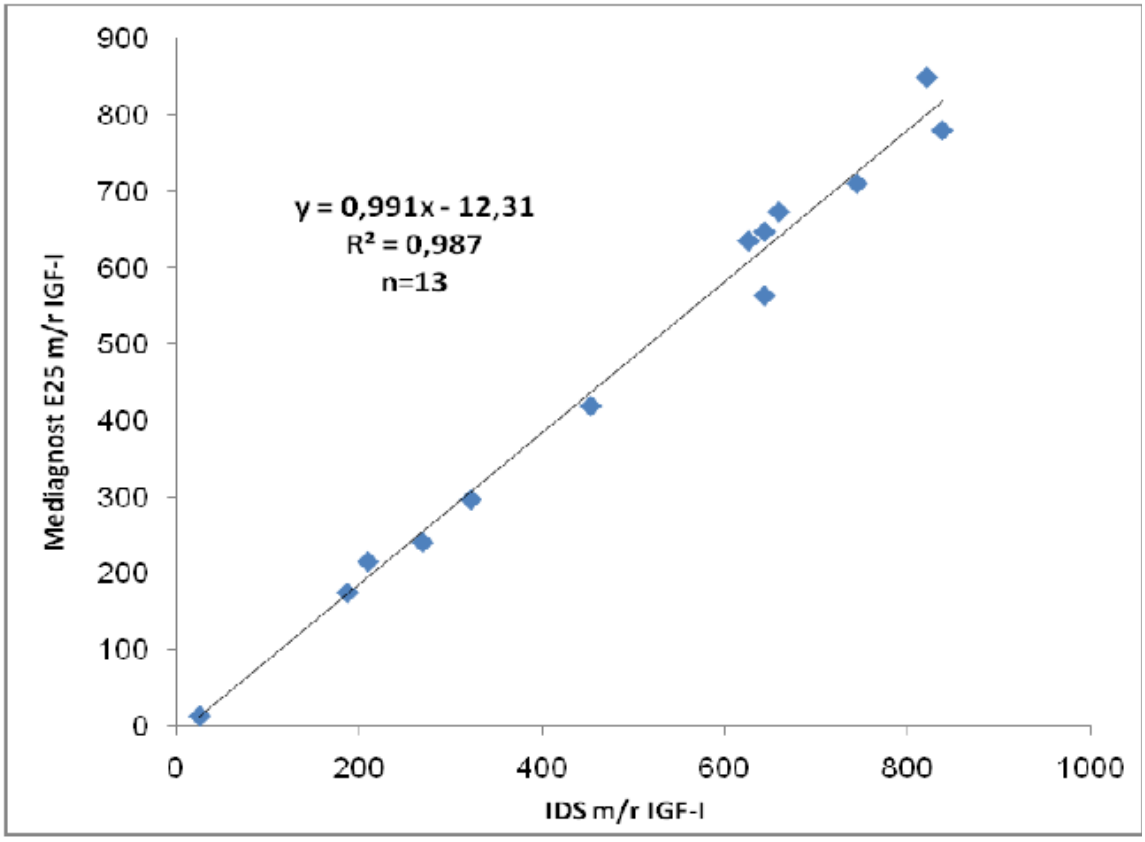


Figure 2: Method comparison m/r IGF-I ELISA and the IDS m/r IGF-I ELISA.

SPECIMEN COLLECTION, PREPARATION, AND STORAGE

Specimen

Mouse-/Rat Serum samples can be used in this assay.

Influence of Heparin (30IE/mL), EDTA (6,8mM) and NaCitrat (0,015M) on the measurement of IGF-I has been investigated in recovery experiments. Buffer solution was enriched with recombinant IGF-I and the above mentioned substances. No significant influence on the recovery of IGF-I was detected, on average the recovery of recombinant material in comparison to enriched PBS was 108%. Haemolytic reactions have to be avoided. The blood has to be allowed to clot and after complete clotting, serum is separated by centrifugation.

Storage of the samples

Storage at RT max. 2 days

Storage at –20°C max. 2 years

More than five freeze/thaw cycles are not possible.

Sample Preparation

Samples have to be diluted in Sample Buffer (PP).

A serum dilution of 1:100 is in general suitable. However, the IGF-I levels can vary individually significant, we would therefore recommend to check this and adjust the dilution respectively.

Technical Recommendations

The assay has to be conducted strictly according the test protocol herein.

Reagents with different lot numbers cannot be mixed. The microtiterplate and reagents are stable until the indicated expiry if stored unopened and protected from sunlight at 2 – 8°C.

Bring all reagents to room temperature (20 - 25□C) before use. Possible precipitations in the buffers have to be resolved before usage by mixing and / or warming.

Incubation at room temperature means: 20-25°C

Standards and Controls

For the reconstitution of the lyophilised components (Standards A - E and Control Sera KS1 &KS2) the kit Sample Buffer PP has to be used. It is recommended to keep reconstituted reagents at room temperature for 15 minutes and then to mix them thoroughly but gently (no foam!) with a Vortex mixer.

The reconstituted standard and controls can be stored for 2 month at –20°C. Repeated freeze/thaw cycles have to be avoided.

Washing Buffer

The required volume of washing buffer is prepared by 1:20 dilution of the provided 20fold concentrate with deionised water. The diluted Washing Buffer is stable for 4 weeks at 2-8°C.

It has to be at room temperature for usage!

Microtiterplate

Unused microtiterplate stripes have to be stored airtight together with the desiccant bag at 2- 8°C. The labelled expiry is not influenced in case of proper storage.

MATERIALS REQUIRED BUT NOT PROVIDED

Precision pipettes (100 and 200µl) Micropipettes and multichannel pipettes with disposable plastic tips

Distilled or Deionized water for dilution of the Washing Buffer (WP) Vortex-mixer Device to aspirate the standards and the samples from the wells Timer (120 min. range) Reservoirs (disposable)

Plate washer and plate shaker (recommended) Calibrated Micro plate reader ("ELISA-Reader") with filter for 450 and 620nm (or □590 nm)

Foil welding device for laminate bags (recommended)

REAGENTS PROVIDED

1)	MTP	**Microtiter plate,** ready for use: Microtiter plate with 96 wells, divided up in 12 strips with 8 wells separately breakable, coated with anti-mouse/rat IGF-I antibody.
2)	CAL	**Standards A-E**, lyophilised, contain recombinant IGF-I. Standard values are between **0.5 - 18 ng/ml** (0.5, 2.5, 6, 12 und 18 ng/ml) IGF-I and have to be reconstituted in **1 ml (each) Sample Buffer PP**. 50 µl per well are used in the assay. If the standards are required for more than one assay process we recommend to store the reconstituted Standards frozen at -20°C. **Attention:** Standards should be thawed only once – where required please store aliquoted in adequate volumes.
3)	DILU VP	**Sample buffer PP**, **125 ml**, ready for use, please use for the reconstitution of Standards A-E, Control Sera KS1 & KS2 and for the serum dilution.
4)	Control	**Control Sera KS1 & KS2**, each **500 µl** lyophilised: Sera have to be reconstituted in **500 µl Sample Buffer PP**. The IGF-I target values and the respective ranges are given on the vial labels. The dilution of the Control Sera KS 1&2 should be according to the dilution of the respective samples, the target values should be obtained by **multiplication** with the respektive **dilution factor**.
5)	Ab	**Antibody Conjugate AK**, 7 ml, ready for use, contains the biotinylated anti-IGF-I antibody. use 50 µl for each well in the assay.
6)	CONJ	**Enzyme Conjugate EK**, 12 ml, ready for use, contains horseradischperoxidase conjugate to streptavidin, use 100 µl for each well in the assay.
7)	WASHBUF 20x	**Washing Buffer (WP), 50 ml, 20 X concentrated** solution. **Washing Buffer (WP)** has to be diluted 1:20 with distilled or demineralised water before use (e.g. add the complete contents of the flask (50 ml) into a graduated flask and fill up with A.dest. to 1000 ml). Attention: After dilution the Washing Buffer is only limited stable, dilute only according to requirements.
8)	SUBST	**Substrate (S), 12 ml,** ready for use, horseradish-peroxidase-(HRP)-substrate, stabilised H2O2 Tetramethylbencidine.
9)	H_2SO_4	**Stopping Solution (SL), 12 ml,** ready for use, 0.2 M sulphuric acid, Caution acid!
10)		Sealing tape for covering of the microtiter plate, 2 x, adhesive.

WARNINGS AND PRECAUTIONS

For in-vitro diagnostic use only. For professional use only.

Before starting the assay, read the instructions completely and carefully. Use the valid version of the package insert provided with the kit. Be sure that everything is understood.

Before use, all kit components should be brought **to room temperature at 20 - 25°C**.

Precipitates in buffers should be dissolved before use by thorough mixing and warming.

Do not mix reagents of different lots. Do not use expired reagents.

The microplate contains snap-off strips. Unused wells must be stored at 2 - 8□C in the sealed foil pouch and used in the frame provided.

Caution: This kit contains material of human and/or animal origin.

No known test methods can offer total assurance of the absence of infectious agents; therefore all components and specimens should be treated as potentially infectious.
Following components contain < 0.01% 2-Methyl-4-isothiazolin-3-one solution as preservative:**A-E, AK, EK, PP**

R34	Irritating to eyes and skin
R43	Sensibilisation through skin contact possible
S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S36/37	Wear suitable protective clothing and gloves
S45	In case of accident or if you feel unwell seek medical advice

Following components contain < 0.01%(w/w) 5-chloro-2-methyl 2H isothiazol-3-one and 2-methyl-2H-isothiazol-3-one as preservative: **A-E, AK, EK, PP, WP**

R36/38	Irritating to eyes and skin
R43	Sensibilisation through skin contact possible
S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S28.1	After contact with skin, wash immediately with plenty of water

Stop solution contains 0.2 M Sulfuric Acid (H_2SO_4)

R36/38	Irritating to eyes and skin
S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S28.1	After contact with skin, wash immediately with plenty of water
S36/37	Wear suitable protective clothing and gloves

Pipetting of samples and reagents must be done as quickly as possible and in the same sequence for each step. Use separate pipette tips for each sample, control and reagent to avoid cross contamination. Use reservoirs only for single reagents. This especially applies to the substrate reservoirs. Using a reservoir for dispensing a substrate solution that had previously been used for the conjugate solution may turn solution colored. Do not pour reagents back into vials as reagent contamination may occur. Mix the contents of the microplate wells thoroughly to ensure good test results. Do not reuse microwells. Do not let wells dry dutiny assay; add reagents immediately after completing the rinsing steps.

TMB-Substrate (S) contains 3,3´,5,5´ Tetramethylbenzidine. Store and Incubate in the dark.

R20/21/R22	Harmful by inhalation, in contact with skin and if swallowed
R36/37/38	Irritating to eyes, respiratory system and skin
S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S28.1	After contact with skin, wash immediately with plenty of water
S36/37	Wear suitable protective clothing and gloves

General first aid procedures:

Skin contact: Wash affected area thoroughly with water. Discard contaminated cloths and shoes.

Eye contact: In case of contact with eyes, rinse immediately with plenty of water at least 15 minutes. In order to assure an effectual rinsing spread the eyelids.

Ingestion: If swallowed, wash out mouth thoroughly with water. Immediately see a physician.

Do not eat, drink or smoke in these areas.

Never pipette the materials with the mouth.

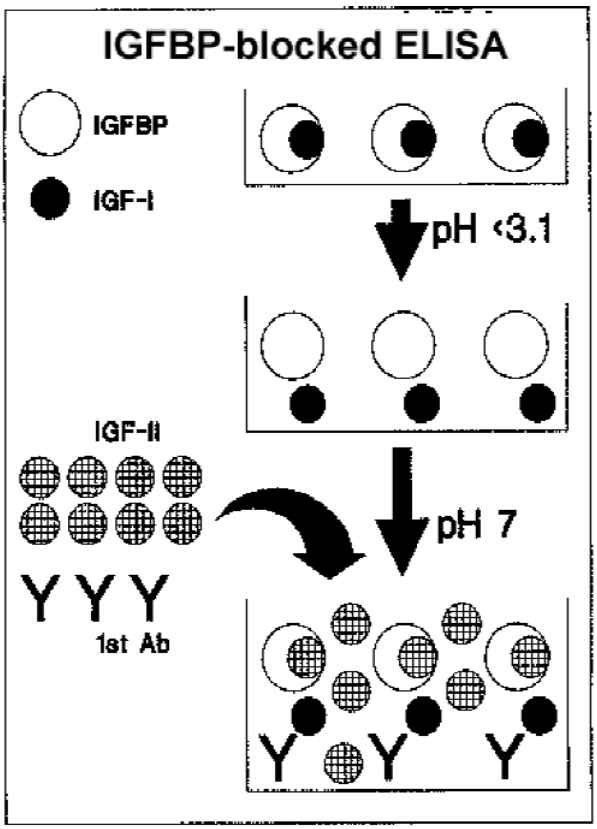
Spilled material must be wiped off immediately and should become disinfected. Clean contaminated areas and equipment with a suitable detergent.

PRINCIPLE OF TEST

The Mediagnost ELISA for m/r IGF-I is a so-called Sandwich-Assay. It utilizes two specific and high affinity antibodies for this protein. The IGF-I in the sample binds to the immobilized first antibody on the microtiter plate, the biotinylated and Streptavidin-Peroxidase conjugated sekond specific anti-IGF-I-Antibody binds in turn to the immobilized IGF-I. In the closing substrate reaction the turn of the colour will be high specific catalysed, quantitatively depending on the IGF-I-level of the samples.

In order to dissociate IGF-I from the IGFBPs, the samples must be diluted in an acidit buffer (Figure 2). The diluted samples are then pipetted into the wells, by this the pHvalue will be neutralized. After neutralization of the samples, the excess IGF-II occupies the IGF-binding sites of the binding proteins, thus allowing the measurement of resulting free IGF-I. With this method, the IGFBPs are not removed, but their function and therefore their interference in the assay is neutralized. Due to the extremely low cross-reactivity of the IGF-I antibody with IGF-II, the excess of IGF-II does not disturb the interaction with IGF-I.

The test runs like a conventional ELISA using a Streptavidin-Peroxidase-Enzyme Conjugate.



ASSAY PROCEDURE

Assay Procedure

All determinations (Standards, Control Sera KS1 & KS2 and samples) should be assayed in duplicate. For optimal results, accurate pipetting and adherence to the protocol are recommended.

When performing the assay, the Standards, Control Sera and the samples should be pipette as fast as possible (e.g., <15 minutes).

All incubations have to conducted at room temperature (20-25°C)

To avoid distortions due to differences in incubation times, Antibody (AK) and Enzyme Conjugate (EK) as well as the following Substrate Solution S should be added to the plate in the same order and in the same time interval as the samples. Stop Solution SL should be added to the plate in the same order as the Substrate Solution.

1) Add **50 µl Antibody Conjugate AK** in **all** wells used

2) Add **50 µl Sample Buffer PP** in the first wells. Subsequently add 50 µl Standard or 50 µl of diluted Control Sera or diluted samples.

3) Cover the wells with sealing tape and incubate the plate for **1 hour** at **room temperature** (shake at 350 rpm)

4) After incubation aspirate the contents of the wells and wash the wells 5 times **250 µl Washing Buffer WP** / well. The washing buffer should incubate for at least for 15 seconds/cycle.

5) Following the last washing step pipette **100 µl** of the **Enzyme Conjugate EK** in each well.

6) Cover the wells with sealing tape and incubate the plate for **0.5 hour** at **room temperature** (shake 350 rpm).

7) After incubation wash the wells 5 times with Washing Buffer as described in step 4

8) Pipette **100 µl of the TMB Substrate** Solution in each well.

9) Incubate the plate for **30 minutes in the dark at room temperature (20 – 25°C)**.

10) Stop the reaction by adding **100 µl of Stopping Solution**.

11) Measure the colour reaction within 30 minutes at 450nm (reference filter ≥590 nm).

CALCULATION OF RESULTS

Establishing the Standard Curve

For the evaluation of the assay it is preconditioned that the absorbance values of the blank should be below 0.20, these of standard E should exceed 1.0.

Samples, which yield higher absorbance values than Standard E are beyond the standard curve, for reliable determinations these samples should be tested anew with a higher dilution.

Standards are provided in the following concentrations (use the concentration unit as preferred):

Establishing the Standard Curve

The standards provided contain the following concentration of hIGFBP-3

Standard	**A**	**B**	**C**	**D**	**E**
ng/ml	0.5	2.5	6	12	18

1) Calculate the **mean absorbance** (MA) value for the blank from the duplicated determination (well A1/A2).

2) Subtract the mean absorbance (MA) of the blank from the mean absorbances of all other values.

3) Plot the standard concentrations on the x-axis versus the mean value of the absorbance of the standards on the y-axis on semi-log paper (lin-log).

4) Recommendation: Calculation of the standard curve should be done by using a computer program. **Non-linear regression**, a higher-grade polynomial or four parametric logistic (4-PL) curve fit are in general suited for the evaluation.

5) The IGF-I concentration of the diluted sample or the diluted control sera KS1&2 in ng/ml (or µg/ml according the chosen unit for the standards) is calculated in this way, the IGF-I concentration of the **undiluted sample** and of KS1 & KS2 is calculated **by multiplication** with the respective dilution factor.

The exemplary shown standard curve in Fig.3 **cannot be used** for calculation of your test results. You have to establish a standard curve for each test you conduct! Exemplary calculation of the IGF-I concentration of an diluted sample:

Measured extinction of your sample 0.70

Measured extinction of the blank 0.02

Your **measurement programm** will calculate the IGF-I concentration of the diluted sample automatically by using the difference of sample and blank for the calculation. You only have to determine the most suitable curve fit (here: polynomial 3rd degree).

In this exemplary case the following equation is solved by the programm to calculate the IGFI concentration in the sample:

$$y = -0.031924+0.2606x-0.010994x^2+0.0019791x^3$$

$$3.0921 = x$$

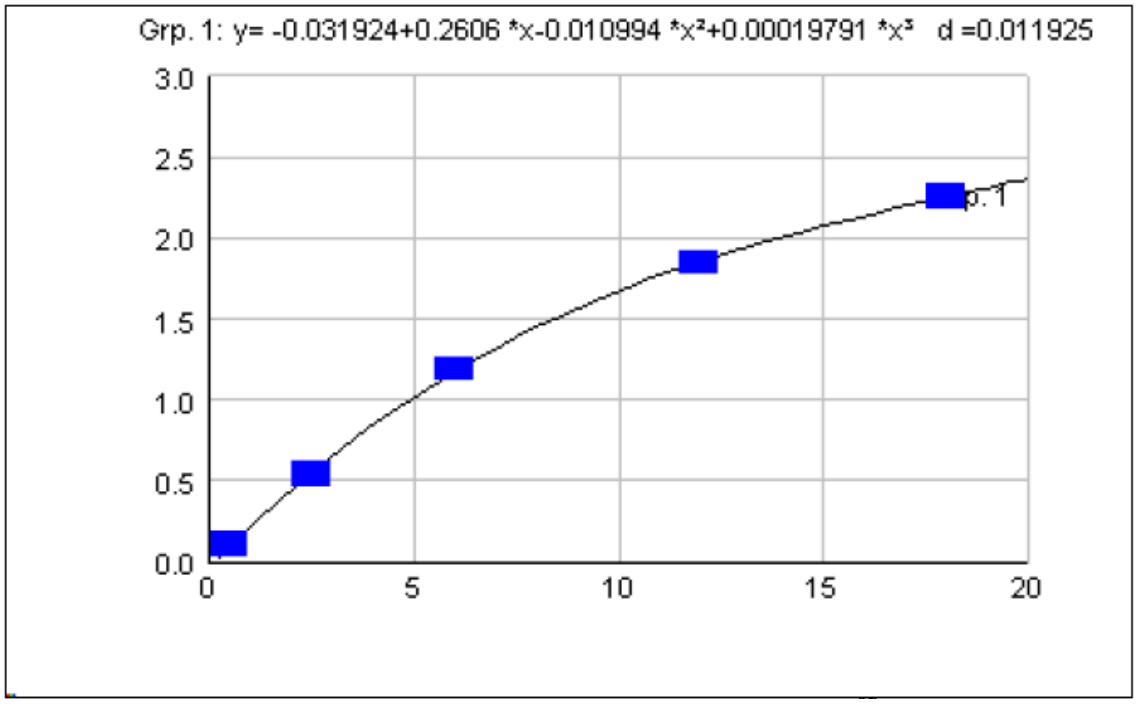


Fig. 3: Exemplary Standard Curve with a polynomial 3rd degree as curve fit.

SUMMARY – IGFBP-3 ELISA

Reconstitution/ Dilution of Reagents		
Standards A-E	Reconstitution in **Sample Buffer PP**	**250 µl each**
Control Serum KS1	Reconstitution in **Sample Buffer PP**	**250 µl each**
Control Serum KS2		
Washing Buffer WP	dilute in **A. dest.** (e.g. add the complete contents of the flask 50 ml into a graduated flask and fill with A.dest. to 1000 ml)	**1:20**
Sample Dilution + Control Serum KS1 and KS2: 1:100 in Sample Buffer PP mix immediately, incubate at least for 15 min, max. 120 min. Use 50 µl for each well in the assay		
Before conducting the assay equilibrate all **reagents to room temperature**		

Assay Procedure for Double Determination:

Pipette	Reagent	Position
50 µl	Antibody Conjugate AK	**in <u>all</u> wells used**
50 µl	Sample Buffer **PP** as Blank	A1 and A2
50 µl	Standard **A** (**0.5 ng/ml**)	B1 and B2
50 µl	Standard **B** (**2.5 ng/ml**)	C1 and C2
50 µl	Standard **C** (**6 ng/ml**)	D1 and D2
50 µl	Standard **D** (**12 ng/ml**)	E1 and E2
50 µl	Standard **E** (**18 ng/ml**)	F1 and F2
50 µl	Control Serum **KS1**	G1 and G2
50 µl	Control Serum **KS2**	H1 and H2
50 µl	**Sample**	Following wells
Cover the wells with the sealing tape		

Incubation: 1 h at RT, ≥ 350 rpm

5x 250 µl	Aspirate the contents of the wells and wash **5x** with **250 µl Wash Buffer WP**	each well
100 µl	Enzyme Conjugate **EK**	each well

Incubation: 30 min at RT, ≥350 rpm

5x 250 µl	Aspirate the contents of the wells and wash **5x** with **250 µl Wash Buffer WP**	each well
100 µl	Substrate **S**	each well

Incubation: 30 min in the dark at RT

100 µl	Stop Solution **SL**	each well
Measure the absorbance within 30 min at **450 nm** (≥590 nm Reference)		

LITERATURE

1) Baxter RC. 1986 The somatomedins: insulin-like growth factors. Adv Clin Chem.25:49-115

2) Daughaday WH, Rotwein P. 1989 Insulin-like growth factors I and II. Peptide, messenger ribonucleic acid and gene structures, serum, and tissue concentrations. Endocr Rev. 10:68-91

3) Spencer EM (Ed.) 1991 Modern Concepts of Insulin-Like Growth Factors. New York: Elsevier.

4) Klapper DG, Svoboda ME, Van Wyk JJ. 1983 Sequence analysis of somatomedin-C: confirmation of identity with insulin-like growth factor-I. Endocrinology. 112:2215-2217.

5) Rinderknecht E, Humbel RE. 1978 The amino acid sequence of human insulin-like growth factor I and its structural homology with proinsulin. J Biol Chem. 253:2769-2276.

6) Clemmons DR, Van Wyk JJ. 1984 Factors controlling blood concentration of somatomedin C. Clin Endocrinol Metab. 13:113-143.

7) Ballard J, Baxter R, Binoux M, et al. 1989 On the nomenclature of the IGF binding proteins. Acta Endocrinol (Copenh). 121:751-752.

8) Drop SLS. 1992 Report on the nomenclature of the IGF binding pro-teins. J. Clin Endocrinol Metab. 74:1215- 1216.

9) Martin JL, Baxter RC. 1986 Insulin-like growth factor binding protein from human plasma. Purification and characterization. J Biol Chem. 261:8754-8760.

10) Binkert C, Landwehr J, Mary JL, Schwander J, Heinrich G. 1989 Cloning, sequence analysis and expression of a cDNA encoding a novel insulin-like growth factor binding protein (IGFBP-2). EMBO J. 8:2497-2502.

11) Furlanetto RW, Underwood LE, Van Wyk JJ, D'Ercole AJ. 1977 Estimation of somatomedin-C levels in normals and patients with pituitary disease by radioimmunoassay.J. Clin Invest. 60:648-657.

12) Daughaday WH, Kapadia M, Mariz I. 1987 Serum somatomedin binding proteins: physiologic significance and interference in radioligand assay. J Lab Clin Med. 109:355-363.

13) Breier BH, Gallaher BW, Gluckman PD. 1991 Radioimmunoassay for insulin-like growth factor-I: solutions to some potential problems and pitfalls. J Endocrinol. 128:347-357.

14) Daughaday WH, Mariz IK, Blethen SL. 1980 Inhibition of access of bound somatomedin to membráně receptor and immunobinding sites: a comparison of radioreceptor and radioimmunoassay of somatomedin in native and acid-ethanol-extracted serum. J Clin Endocrinol Metab. 51:781-788.

15) Blum WF, Gallaher B, Ranke MB. 1992 An IGFBP-blocked IGF-I RIA that measures what it pretends to measure: IGF-I. 74th Annual Meeting of the American Endocrine Society. 293.

16) Rosenfeld RG, Wilson DM, Lee PDK, Hintz RL. 1986 Insulin-like growth factors I and II in evaluation of growth retardation. J Pediatr. 109:428-433.

17) Clemmons DR, Van-Wyk JJ, Ridgway EC, Kliman B, Kjellberg RN, Underwood LE. 1979 Evaluation of acromegaly by radioimmunoassay of somatomedin-C.N.Engl J Med. 301:1138-1142

18) Zapf J, Walter H, Froesch ER. 1981 Radioimmunological determination of insulin-like growth factors I and II in normal subjects and in patients with growth disorders and extrapancreatic tumor hypoglycemia. J Clin Invest. 68:1321-1330.

19) Blum WF. 1992 Insulin-like growth factors and their binding proteins. In: Ranke MB, ed. Functional Endocrinologic Diagnostics in Children and Adolescence. Mannheim: J + J Verlag; 102-117.

20) Rieu M, Girard F, Bricaire H, Binoux M. 1982 The importance of insulin-like growth factor (somatomedin) measurements in the diagnosis and surveillance of acromegaly. J Clin Endocrinol Metab. 55:147-153.

21) Blum WF, Ranke MB, Bierich JR. 1988 A specific radioimmunoassay for insulin-like growth factor II: the interference of IGF binding proteins can be blocked by excess IGF-I. Acta Endocrinol (Copenh).118:374- 380.

22) Wilson EM, Oh Y, Rosenfeld RG (1997) Generation and characterization of an IGFBP-7 antibody: Identification of 31 kD IGFBP-7 in human biological fluids and Hs578T human breast cancer conditioned media. J Clin Endocrinol Metab Vol 82, 4:1301-1303

23) Ranke MB, Schweizer R, Elmlinger MW, Weber K, Binder G, Schwarze CP, Wollmann HA (2000) Significance of basal IGF-I, IGFBP-3 and IGFBP-2 measurements in the diagnostics of short stature in children. Horm Res 54:60-68

24) Ranke MB, Schweizer R, Elmlinger MW, Weber K, Binder G, Schwarze CP, Wollmann HA (2001) Relevance of IGF-I, IGFBP-3 and IGFBP-2 measurements during GH treatment of GH-deficient and non- GH-deficient children and adolescents. Horm Res 55:155-124

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CTPark Modrice
Evropska 873
664 42 Modrice
CZECH REPUBLIC
Phone: +420-549 124 185
Fax: +420-549 211 460
e-mail: info@biovendor.com
http://www.biovendor.com

European Union:

BioVendor GmbH
Im Neuenheimer Feld 583
D-69120 Heidelberg, GERMANY
Phone: +49-6221-433-9100
Fax: +49-6221-433-9111
e mail: roth@biovendor.com
e mail: abels@biovendor.com

China - Hong Kong Office:

BioVendor Laboratories Ltd.
Room 4008, Hong Kong Plaza, No.188
Connaught Road West
Hong Kong, CHINA
Phone: +852 28030523
Fax: +852 28030525
e-mail: lu@biovendor.com

USA, Canada and Mexico:

BioVendor, LLC
1463 Sand Hill Road, Suite 227
Candler, NC 28715, USA
Phone: +1-828-670-7807, +1-800-404-7807
Fax: +1-828-670-7809
e mail: info-us@biovendor.com

China – Mainland Office:

BioVendor Laboratories Ltd.
Room 2405, YiYa Tower, TianYu Garden, No.150
Lihe Zhong Road, Guang Zhou, CHINA
Phone: +86-20-87063029
Fax: +86-20-87063016
e-mail: jhsu@biovendor.com

Manufactured by

Aspenhausttr. 25
D-71770 Reutlingen
Germany
http://www.mediagnost.de
e-mail: contact@mediagnost.de