

## Instructions for Use



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# Glucagon ELISA

This ELISA kit can specifically measure glucagon produced in  $\alpha$ -cells of pancreas by combining antibodies that recognize both the C-terminus and the N-terminus.

**REF** **30227003**

 **96**

**For illustrative purposes only.**

**To perform the assay the instructions for use provided with the kit have to be used.**

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Flughafenstrasse 52a  
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**Always there for you**



## Glucagon ELISA Kit – IBL

96 Well

Please read carefully this instruction prior you use this assay kit.

### INSTRUCTIONS FOR USE

This product is for research use only and is not intended for diagnostic use.

### KIT COMPONENT

1	<b>Precoated plate:</b> (Anti- Glucagon (23-29)* 142A1A Mouse IgG MoAb)	96Well x 1
2	<b>Labeled antibody conc.:</b> (30X) HRP conjugated Anti- Glucagon N6mer 201A2A Rat IgG Fab')	0.4mL x 1
3	<b>Standard:</b> (Glucagon)	0.5mL x 2
4	<b>EIA buffer</b>	30mL x 1
5	<b>Solution for labeled antibody</b>	12mL x 1
6	<b>Chromogen:</b> TMB solution	15mL x 1
7	<b>Stop solution</b>	12mL x 1
8	<b>Wash buffer conc.</b>	50mL x 1

### MEASURING SAMPLES

Human EDTA plasma.

※It is recommended to use purpose made blood collection tubes in order to preserve Glucagon.  
(eg. BDTM Blood Collection System for Preservation of Plasma GLP-1, GIP, Glucagon and Ghrelin, BD Biosciences)

### PRINCIPLE

This kit is a solid phase sandwich ELISA (Enzyme-linked Immunosorbent Assay). As a primary antibody is coated on a plate, samples and standard are added into the wells for 1<sup>st</sup> reaction. After the reaction, HRP-conjugated secondary antibody is added into the wells for 2<sup>nd</sup> reaction. After washing away unbound the secondary antibody, Tetra Methyl Benzidine (TMB) is added to the wells and color develops.

### OPERATING PRECATION

- Test samples should be measured soon after collection. For storage of samples, store them frozen at -80°C and do not repeat freeze/thaw cycles. Thaw the test samples at a low temperature and mix them completely before measurement.
- Test samples should be diluted with "4, EIA buffer" contained in this kit.
- Duplicate measurement of test samples and standards is recommended.
- Standard curve should run for each assay.
- Use test samples in neutral pH range. The contaminations of organic solvent may affect the measurement.
- All reagents should be brought to room temperature (R.T.) and mixed completely and gently before use. After mixing them, make sure of no change in quality of the reagents.
- Use only "8, Wash buffer conc." contained in this kit for washing the precoated plate. Insufficient washing may lead to the failure in measurement.
- Using a plate washer is recommended (wait time zero second). It should be washed by a plate washer immediately after each reaction. If you use a washing bottle instead of a plate washer, after filling wash buffer in each well, immediately turn the plate upside down and shake it off to completely remove the wash buffer. Repeat the number of times of wash defined in a table for measurement procedure described in section 3. It should be properly washed off as instructed in order to avoid any insufficient wash.
- Carefully tap the plate against a clean paper towel without contacting with inside of each well to completely remove the washing buffer after repeated the determined number of wash.
- "6, Chromogen - TMB solution" should be stored in the dark due to its sensitivity against light. It should be also avoided contact with metals. Required quantity should be prepared into a collecting container for each use.
- After adding TMB solution into the wells, the liquid in the wells gradually changes the color in blue. In this process the plate should be in dark. Remained TMB solution in the collecting container should not be returned into the original bottle of TMB solution to avoid contamination.
- Measurement of O.D. should be done within 30 minutes after addition of "7, Stop solution".

### OPERATION MANUAL AND DOSAGES

#### 1. Materials needed but not supplied.

Plate reader	Micropipette and tip
Test tubes for dilution	Measuring cylinder and beaker
Deionized water	Plate washer or washing bottle
Paper towel	Collecting container
Refrigerator	(i.e. clean disposable test tube)

#### 2. Preparation

- Preparation of wash buffer  
Dilute "8, Wash buffer conc." 40 fold with deionized water. The diluted one is used

for the assay as a wash buffer. Adjust the required quantities if needed.

- Preparation of labeled antibody  
Dilute "2, Labeled antibody conc." 30 fold with "5, Solution for labeled antibody" using a prepared collecting container.

#### Example)

In case you use one strip (8 well), the required quantity of Labeled antibody is 800  $\mu$ L. (Dilute 30  $\mu$ L of "2, Labeled antibody Conc." with 870  $\mu$ L of "5, Solution for labeled antibody" and mix it. And use 100 $\mu$ L the mixed solution in each well.)  
This operation should be done just before applying labeled antibody.

The remaining "2, Labeled antibody Conc." should be stored at 4°C in a firmly sealed vial.

- Preparation of standard

Add 0.5 mL of deionized water into the vial of "3, Standard" and completely dissolve it. Concentration of the standard is 40 pmol/L. The standards enclosed in this kit can be frozen and stored after reconstitution. However the freeze-thaw shall not be repeated.

Prepare 7 test tubes for dilution of the standard and adding 230  $\mu$ L of the EIA buffer into each tube.

Put 230  $\mu$ L of 40 pmol/L standard into the tube 20 pmol/L (Tube-1) and gently mix it. Afterword, put 230  $\mu$ L of the mixed liquid of tube-1 into the tube 10 pmol/L (Tube-2) and gently mix it. Dilute two fold standard solution in series to set up 7 points of diluted standard between 20 pmol/L and 0.31 pmol/L.

Tube-1	20	pmol/L
Tube-2	10	pmol/L
Tube-3	5	pmol/L
Tube-4	2.5	pmol/L
Tube-5	1.25	pmol/L
Tube-6	0.63	pmol/L
Tube-7	0.31	pmol/L

- Preparation of test samples

Dilute test samples with "4, EIA buffer" contained in this kit as follows.

Human EDTA plasma : 2 fold

### 3. Measurement Procedure

- Add test sample blank  
Determine wells for test sample blank. Put 100 $\mu$ L each of "4, EIA buffer" into the wells.
- Add prepared test samples and standard  
Put 100  $\mu$ L prepared test samples and 100  $\mu$ L prepared standard into appropriate wells.
- Incubation with plate lid (1st reaction).
- Washing (Refer to No. 8 and 9 described in OPERATING PRECATION.)  
Wash the plate with the prepared wash buffer and remove all liquid.
- Add prepared labeled antibody  
Put 100  $\mu$ L prepared labeled antibody into the wells.
- Incubation with plate lid (2nd reaction).
- Washing (Refer to No. 8 and 9 described in OPERATING PRECATION.)  
Wash the plate with the prepared wash buffer and remove all liquid completely.
- Add "6, Chromogen - TMB solution"  
Put 100  $\mu$ L the TMB solution into the wells.
- Incubation in dark
- Add "7, Stop solution"  
Put 100  $\mu$ L the Stop solution into the wells.
- Determination of optical density (O.D.)  
Remove any dirt or drop of water on the bottom of the plate and confirm there is no bubble on the surface of the liquid. Then, measure the both O.D. of standard and the test samples against a test sample blank.  
Measurement wavelength: 450 nm. In case of 2 wavelengths:  
Main wavelength is 450nm. Sub-wavelength is between 600 and 650 nm.

Table for measurement procedure

	Test samples	Standard	Test sample blank
Reagents	Test samples 100 $\mu$ L	Diluted Standard 100 $\mu$ L	EIA buffer 100 $\mu$ L
1st reaction	Incubation for overnight at 2~8°C with plate lid		
Washing	2 times (wash buffer more than 350 $\mu$ L) (Refer to No. 8 and 9 described in OPERATING PRECATION.)		
Labeled antibody	100 $\mu$ L	100 $\mu$ L	100 $\mu$ L
2nd reaction	Incubation for 60 minutes at 2 ~8°C with plate lid		
Washing	3 times (wash buffer more than 350 $\mu$ L) (Refer to No. 8 and 9 described in OPERATING PRECATION.)		
TMB solution	100 $\mu$ L	100 $\mu$ L	100 $\mu$ L
Chromogenic reaction	Incubation for 30 minutes at R.T. (shielded).		

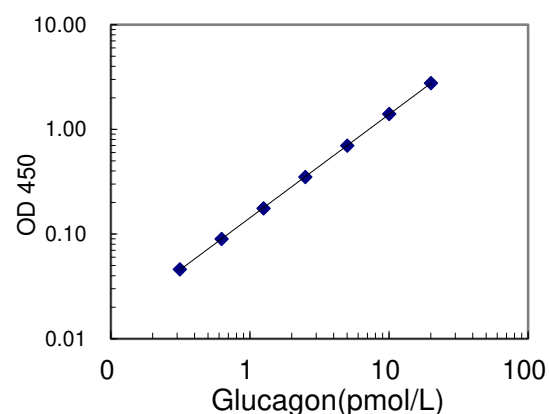
Stop solution	100 $\mu$ L	100 $\mu$ L	100 $\mu$ L
Measuring O.D.	450 nm / 600~650 nm		

### CALCULATION OF TEST RESULT

- Plot the concentration of the standard on the x-axis and its O.D. on the y-axis. Draw a standard curve by applying appropriate regression curve on each plot (i.e. quadratic regression of double logarithm conversion).
- Read the concentration by applying the absorbance of the test samples on a standard curve.
- Calculate the concentration of the test samples by multiplying dilution ratio of test samples on the value.

Example of standard curve and measured value

Standard (pmol/L)	O.D. (450nm)
20.	2.763
10.	1.402
5.	0.698
2.5	0.350
1.25	0.176
0.63	0.090
0.31	0.046



### PERFORMANCE AND CHARACTERISTICS

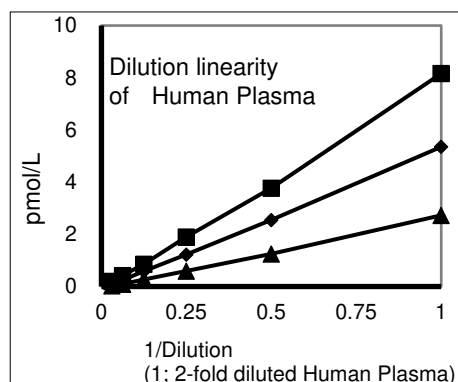
#### 1 Sensitivity

0.05 pmol/L (Calculated by NCCLS method using the standard.)

#### 2 Measurement range

0.31 ~ 20 pmol/L

#### 3 Dilution linearity



#### 4 Added recovery assay

Specimen	Additive Amount (pmol/L)	Theoretical Value (pmol/L)	Measurement Value (pmol/L)	%
Human EDTA-Plasma(x2)	10.00	11.95	12.52	104.8
	2.50	4.45	4.41	99.1
	0.63	2.58	2.40	93.0

#### 5 Intra-assay

Measurement value (pmol/L)	SD (pmol/L)	CV (%)	n
11.00	0.43	3.9	24
2.73	0.10	3.7	24
0.73	0.05	6.8	24

#### 6 Inter-assay

Measurement value (pmol/L)	SD (pmol/L)	CV (%)	n
11.17	0.23	2.1	8
2.84	0.09	3.2	8
0.75	0.04	5.3	8

### 7 Interfering Substances

Hemolyzed hemoglobin does not affect on the value of measurement up to 54 mg/dL.

Free bilirubin does not affect on the value of measurement up to 20 mg/dL.

Conjugated bilirubin does not affect on the value of measurement up to 20 mg/dL.

Chyle does not affect on the value of measurement up to 1,410 FTU.

### 8 Specificity

Substance	Cross reactivity (%)
Oxyntomodulin	0.06
Glicentin(1-61)	0.05
Glucagon(3-29)	<0.01
Glicentin(1-69)	<0.01
Mini-glucagon	<0.01
GLP-1(7-36)amide	0.01
GLP-1(9-36)amide	0.01
GLP-2	<0.01
GIP(1-42)	<0.01
GIP(3-42)	<0.01

### 9 Calibration Reference Material

WHO International Standard Glucagon, Porcine NIBSC code;69/194

### PRECAUTION FOR INTENDED USE AND/OR HANDLING

#### 1 Precaution for handling (Hazard prevention)

- Treat the components carefully and wash hands after handling it.
- "7, Stop solution" is a strong acid substance (1N Sulfuric acid). Therefore, it should be careful for the treatment and do not contact your skin and clothes with it. It also needs to pay attention to the disposal of it.

#### 2 Precaution for intended use

- "3, Standard" is lyophilized products. It should be careful to open this vial.
- All reagents should be stored at 2 - 8°C.
- Precipitation can be seen in "4, EIA buffer", "5, Solution for labeled antibody" and "8, Wash buffer conc.", however, it does not affect its performance.
- Do not mix or replace the reagents with the reagents from a different lot or kit.
- Do not use expired reagents.

#### 3 Precaution for disposal

- Dispose used materials after rinsing them with large quantity of water.

### REFERENCE

- Kobayashi M, Maruyama N, Yamamoto Y, Togawa T, Ida T, Yoshida M, Miyazato M, Kitada M, Hayashi Y, Kashiwagi A, Kitamura T. A newly developed glucagon sandwich ELISA is useful for more accurate glucagon evaluation than the currently used sandwich ELISA in subjects with elevated plasma proglucagon-derived peptide levels.

J Diabetes Investig. 2023 May;14(5):648-658.

### STORAGE AND THE TERM OF VALIDITY

Storage Condition: 2 - 8°C

The expiry date is specified on the outer box.

### PACKAGE UNIT AND PRODUCT NUMBER

Package unit: 96 Well

Product number: 27797
















### CONTACT DETAILS

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# Symbols / Symbole / Symboles / Símbolos / Simboli / Símbolos / Σύμβολα

	Cat.-No.: / Kat.-Nr.: / No.- Cat.: / Cat.-No.: / N.-Cat.: / N.º Cat.: / Αριθμός-Κατ.:
	Lot-No.: / Chargen-Bez.: / No. Lot: / Lot-No.: / Lotto n.: / Lote N.º: / Αριθμός -Παραγωγή:
	Use by: / Verwendbar bis: / Utiliser à: / Usado por: / Da utilizzare entro:/ Usar até: / Χρησιμοποιείται από:
	No. of Tests: / Kitgröße: / Nb. de Tests: / No. de Determ.: / Quantità dei tests: / N.º de Testes: / Αριθμός εξετάσεων:
	Concentrate / Konzentrat / Concentré / Concentrar / Concentrato / Concentrado / Συμπύκνωμα
	Lyophilized / Lyophilisat / Lyophilisé / Liofilizado / Liofilizzato / Liofilizado / Λυοφιλοποιημένο
	In Vitro Diagnostic Medical Device / In-vitro-Diagnostikum / Appareil Médical pour Diagnostics In Vitro / Dispositivo Médico para Diagnóstico In Vitro / Dispositivo Medico Diagnostico In vitro / Equipamento Médico de Diagnóstico In Vitro / Ιατρική συσκευή για In-Vitro Διάγνωση
	Contains biological material of human origin / Enthält biologisches Material menschlichen Ursprungs / Contient une substance biologique d'origine humaine / Contiene material biológico de origen humano / Contiene materiale biologico di origine umana / Contém material biológico de origem humana / Περιέχει βιολογικό υλικό ανθρώπινης προέλευσης
	Contains biological material of animal origin / Enthält biologisches Material tierischen Ursprungs / Contient une substance biologique d'origine animale / Contiene material biológico de origen animal / Contiene materiale biologico di origine animale / Contém material biológico de origem animal / Περιέχει βιολογικό υλικό ζωικής προέλευσης
	Unique Device Identification / Eindeutige Geräteerkennung / Identifiant de dispositif unique / Identificación única de producto / Identificatore univoco del dispositivo / Identificador de dispositivo único / Μοναδικός αναγνωριστικός κωδικός προϊόντος
	Read instructions before use / Arbeitsanleitung lesen / Lire la fiche technique avant emploi / Lea las instrucciones antes de usar / Leggere le istruzioni prima dell'uso / Ler as instruções antes de usar / Διαβάστε τις οδηγίες πριν την χρήση
	Keep away from heat or direct sun light / Vor Hitze und direkter Sonneneinstrahlung schützen / Garder à l'abri de la chaleur et de toute exposition lumineuse / Manténgase alejado del calor o la luz solar directa / Non esporre ai raggi solari / Manter longe do calor ou luz solar directa / Να φυλάσσεται μακριά από θερμότητα και άμεση επαφή με το φως του ηλίου
	Store at: / Lagern bei: / Stocker à: / Almacene a: / Armazena a: / Conservare a: / Armazena em: / Αποθήκευση στους:
	Store at: 2 - 8°C / Lagern bei: 2 - 8°C / Stocker à: 2 - 8°C / Almacene a: 2 - 8°C / Armazena a: 2 - 8°C / Conservare a: 2-8°C / Armazena em: 2-8°C / Αποθήκευση στους: 2-8°C
	Manufacturer: / Hersteller: / Fabricant: / Productor: / Fabricante: / Fabbricante: / Παραγωγός:
	Distributor: / Distributor: / Distributeur: / Distributor: / Distributore: / Distribuidor: / Διανομέας:
	Caution! / Vorsicht! / Attention! / ¡Precaución! / Attenzione! / Cuidado! / Προσοχή!
	Symbols of the kit components see MATERIALS SUPPLIED. Die Symbole der Komponenten sind im Kapitel KOMPONENTEN DES KITS beschrieben. Voir MATERIEL FOURNI pour les symboles des composants du kit. Símbolos de los componentes del juego de reactivos, vea MATERIALES SUMINISTRADOS. Per i simboli dei componenti del kit si veda COMPONENTI DEL KIT. Para símbolos dos componentes do kit ver MATERIAIS FORNECIDOS. Για τα σύμβολα των συστατικών του κιτ συμβουλευτείτε το ΠΑΡΕΧΟΜΕΝΑ ΥΛΙΚΑ.

Generic table, not all symbols are present in the product

**COMPLAINTS:** Complaints may be submitted initially written or vocal. Subsequently they need to be filed including the test performance and results in writing in case of analytical reasons.

**WARRANTY:** The product is warranted to be free from material defects within the specific shelf life and to comply with product specifications delivered with the product. The product must be used according to the Intended use, all instructions given in the instructions for use and within the product specific shelf life. Any modification of the test procedure or exchange or mixing of components of different lots could negatively affect the results. These cases invalidate any claim for replacement.

**LIMITATION OF LIABILITY:** IN ALL CIRCUMSTANCES THE EXTENT OF MANUFACTURER'S LIABILITY IS LIMITED TO THE PURCHASE PRICE OF THE KIT(S) IN QUESTION. IN NO EVENT SHALL MANUFACTURER BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING DAMAGES FOR LOST PROFITS, LOST SALES, INJURY TO PERSON OR PROPERTY OR ANY OTHER INCIDENTAL OR CONSEQUENTIAL LOSS.

The labelling of hazardous substances is according to European directive.

For further country-specific classifications, please refer to the corresponding safety data sheet.



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