



**Crystal Chem**

# **Total GIP ELISA Kit Instructions**

For the quantitative determination of total GIP  
in human plasma and cell culture media

**Catalog #81515  
96 Assays**

**For research use only. Not for use in diagnostic procedures.**

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**A. Intended Use**

The Total GIP ELISA kit is for the quantitative determination of total GIP in human plasma and cell culture media. Please read the complete kit insert before performing this assay. The kit is for RESEARCH USE ONLY. It is not intended for use in diagnostic procedures.

**B. Introduction**

Glucose-dependent insulinotropic polypeptide (GIP) is a 42 amino acid hormone part of a group of gastrointestinal hormones that cause an increase in the amount of insulin released from the beta cells of the islets of Langerhans after ingestion of food.

GIP is released from duodenal endocrine K cells after absorption of glucose or fat. GIP is a potent releaser of insulin in experimental animals and in humans provided that the blood glucose is above basal level. Recent studies demonstrate GIP may have a lot of physiological effects in addition to their glucoregulatory effects.

GIP is rapidly inactivated by DPP-4 enzyme to GIP (3-42) with a blood half-life of only several minutes. This kit can be used for measurement of total GIP [both GIP (1-42) and GIP (3-42)] in human plasma and cell culture media with high sensitivity.

**C. Principle of the Assay**

The Total GIP ELISA kit is based on a sandwich enzyme immunoassay. The 96-well plate is coated with an antibody against human GIP in which samples are added to the wells. After incubation and plate washing, HRP labeled antibody solution is added to form an antibody-antigen labeled antibody complex. Finally, HRP enzyme activity is determined by TMB and the concentration of human total GIP is calculated.

**D. Kit Storage**

1. Upon receipt of the Total GIP ELISA kit, store it at 2-8°C and avoid light exposure (do not freeze the kit or hold it at temperatures above 25°C).
2. The kit should not be used after the expiration date.

**E. Assay Materials**

**E.1. Materials provided**

**TABLE 1 Contents of the kit**

<b>Mark</b>	<b>Description</b>	<b>Amount</b>
MIC	Antibody-coated Microplate (96 wells)	1 pack
STD	Standard	1 vial
HRPAS	HRP Labeled Antibody Solution	1 x 12 mL
TMB	Enzyme Substrate Solution (TMB)	1 x 12 mL
STOP	Stop Solution	1 x 12 mL
BUF	Buffer Solution	1 x 25 mL
WASH	Washing Solution (20X Concentrated)	1 x 50 mL
	Adhesive foil	3 sheets

## **E.2. Materials required but not provided**

Micropipettes and disposable tips  
Distilled water  
Polypropylene microtubes  
Volumetric flasks  
Microplate shaker  
Microplate reader (capable of reading  $A_{450}$  and  $A_{630}$  values)

## **F. Assay Precautions**

1. Only appropriately-trained personnel should use the kit. Laboratory personnel should wear suitable protective clothing. All chemicals and reagents should be considered potentially hazardous. Avoid ingestion and contact with skin and eyes.
2. Some assay components contain human sourced materials. Accordingly, all assay components should be handled as if potentially infectious using safe laboratory procedures.
3. Do not use the reagents after the expiration date.
4. Reagents are light sensitive and should be protected from sunlight.

## **G. Maximizing Kit Performance**

1. Given the small sample volumes required (50  $\mu$ L), pipetting should be done as carefully as possible. A high quality 100  $\mu$ L or better precision pipette should be used for such volumes. Drops of liquid adhering to the outside of the pipette tips should be removed by wiping to ensure the highest degree of accuracy.
2. In order to prevent the microplate wells from drying out and to get the best results, samples and reagents should be dispensed quickly into the wells.
3. Each calibrator and sample should be assayed in duplicate.
4. The same sequence of pipetting and other operations should be maintained in all procedures.
5. Do not mix reagents that have different lot numbers.

## **H. Sample Collection**

An EDTA-2Na (1 mg/mL) additive blood collection tube is recommended for plasma collection. If the same blood is to be used to measure active GIP, add DPP-4 inhibitor (0.01 mL per mL of blood) to the collection tube immediately. Plasma samples should be used as soon as possible after collection. For later testing, samples should be aliquoted and stored at below  $-70^{\circ}\text{C}$ . Avoid repeated freezing and thawing.

## **I. Assay Procedure**

### **I.1. Preparation of reagents**

1. Antibody-coated microplate  
Provided as ready to use.
2. Standard

The standard is provided in lyophilized form (0.4 pmol/vial). Working standards should be prepared immediately prior to use as described in Section I.2. The working standard concentrations are 0, 3.1, 6.3, 12.5, 25, 50, 100, and 200 pM. To prepare working standards, the lyophilized standard must be first reconstituted. The reconstituted standard once prepared is recommended to be stored frozen at below  $-70^{\circ}\text{C}$  if not used all at once. The reconstituted standard should be not be repeatedly thawed, so the 400 pM reconstituted standard should be appropriately aliquoted in appropriate volumes prior to being frozen. The reconstituted standard is stable for at least 2 months at below  $-70^{\circ}\text{C}$ . The working standards should be discarded after each use.

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3. HRP Labeled Antibody Solution  
Provided as ready to use.
4. Enzyme Substrate Solution (TMB)  
Provided as ready to use.
5. Stop Solution  
Provided as ready to use.
6. Buffer Solution  
Provided as ready to use.
7. Wash Buffer (20X Concentrated)  
The wash buffer has to be diluted 1:20 with distilled or deionized water prior to use. For example, 50 mL of wash buffer must be diluted with 950 mL of distilled or deionized water.

### I.2. Preparation of working standards

1. Reconstitute standard (0.4 pmol/vial) with 1 mL of Buffer Solution (marked "BUF") and mix thoroughly, resulting in a 400 pM reconstituted standard.
2. Dispense 0.2 mL of Buffer Solution into seven polypropylene microtubes labeled 200, 100, 50, 25, 12.5, 6.3, and 3.1 pM.
3. Dispense 0.2 mL of the 400 pM standard into the 200 pM microtube, and mix thoroughly.
4. Dispense 0.2 mL of the 200 pM standard into the 100 pM microtube, and mix thoroughly.
5. Dispense 0.2 mL of the 100 pM standard into the 50 pM microtube, and mix thoroughly.
6. Repeat this dilution scheme using the remaining microtubes.
7. Dispense 0.2 mL of Buffer Solution into one polypropylene microtube labeled 0 pM. You should now have working standards of 200, 100, 50, 25, 12.5, 6.3, 3.1, and 0 pM.

**Please note:** Working standards should be prepared immediately prior to use.

### I.3. Assay procedure

Prior to running the assay, all reagents should be brought to room temperature for at least 30 minutes. Reagents should be stored at 2-8°C immediately after use. To maximize stability, reconstituted standard should be stored at below -70°C. Before use, mix the reagents thoroughly by gentle agitation or swirling.

1. Aspirate well contents and wash three times using 350  $\mu$ L of Wash Buffer per well. After each wash, remove any remaining solution by inverting and tapping the plate firmly on a clean paper towel.
2. In each well, add 50  $\mu$ L of Buffer Solution.
3. In each well, add 50  $\mu$ L of sample or standard and mix well by repeated pipetting.
4. Cover the wells with adhesive foil and incubate the plate for 2 hours at room temperature on a microplate shaker (shake at 100 rpm).
5. Aspirate well contents and wash four times using 350  $\mu$ L of Wash Buffer per well. After each wash, remove any remaining solution by inverting and tapping the plate firmly on a clean paper towel.
6. Add 100  $\mu$ L of the HRP Labeled Antibody Solution in each well.
7. Cover the wells with adhesive foil and incubate the plate for 1 hour at room temperature on a microplate shaker (shake at 100 rpm).
8. Aspirate well contents and wash four times using 350  $\mu$ L of Wash Buffer per well. After each wash, remove any remaining solution by inverting and tapping the plate firmly on a clean paper towel.

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9. Add 100  $\mu\text{L}$  of Enzyme Substrate Solution (TMB) in each well. Cover the wells with adhesive foil and incubate the plate for 30 mins in dark room at room temperature without shaking.
10. Stop the reaction by adding 100  $\mu\text{L}$  of Stop Solution to each well.
11. Measure absorbance within 30 minutes using a plate reader (measure  $A_{450}$  values and subtract  $A_{630}$  values).

### I.4. Determining the total GIP concentration

1. Using computer software, construct the total GIP calibration curve by plotting the mean change in absorbance value for each calibrator (incl. blank) on the Y axis versus the corresponding total GIP concentration on the X axis. A higher-grade polynomial or four parametric logistic (4-PL) curve fit are suitable for the evaluation.

*Note: A calibration curve should be plotted every time the assay is performed.*

2. Total GIP concentrations in the samples are interpolated using the calibration curve and mean absorbance values for each sample. The total GIP concentration is expressed in pM.

*Note: Samples with high total GIP concentrations (ie. fall above the range of the assay) should be further diluted with the Buffer Solution and rerun.*

### J. Performance characteristics

#### J.1. Assay range

The Total GIP ELISA Kit has an assay range from 3.1 – 200 pM.

#### J.2. Precision

The assay has a within-run and total precision of CV < 10%.

#### J.3. Cross reactivity

The assay has a high specificity for total GIP and shows no cross reactivity to glucagon, GLP-2, GLP-1 (7-37), GLP-1 (7-36)  $\text{NH}_2$ , and GLP-1 (9-36)  $\text{NH}_2$ .

### Warranty

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