

# A Gut Feeling for hormones

Gastrointestinal peptides such as GLP-1 and GIP play important roles in many metabolic diseases as agonists or antagonists, and are often used and explored as treatment options for diabetes and obesity. Recent studies suggest the proglucagon-derived protein glicentin could be a novel biomarker for the prediction of weight loss after bariatric surgery. Mercodia offers highly specific immunoassays for the detection and quantification of this novel biomarker, glicentin, as well as GLP-1 and GIP.

# Mercodia assays for gut hormones

Mercodia offers immunoassays for the gut hormones GLP-1, GIP and glicentin.

## GLP-1

An incretin hormone mainly processed from proglucagon in the intestinal L-cells. The biologically active forms are GLP-1 (7-36) amide and GLP-1 (7-37). These forms have a short half-life of only a couple of minutes, due to its rapid degradation by the enzyme DPP4. The enzymatic processing, catalyzed by DPP4, results in the forms: GLP-1 (9-36) amide and GLP-1 (9-37)<sup>1</sup>.

## GIP

GIP was the first incretin to be identified and is derived by proteolytic processing of a 153-residue precursor, preproGIP, expressed in intestinal K cells. GIP 1-42 (active GIP) is rapidly cleaved in circulation at the N-terminus by DPP-4 to yield GIP 3-42, regarded as a non-active form of GIP<sup>1</sup>.

## Glicentin

A proglucagon-derived peptide mainly produced in the L-intestinal cells, after stimulation by food intake. The glicentin peptide contains the entire sequence of glucagon, GRPP and oxyntomodulin.



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## Total vs Active

Active GIP/GLP-1 is rapidly cleaved in circulation at the N-terminus by DPP-4. Because of this quick proteolytic degradation, not only intact but also total (i.e intact plus DPP-4-metabolized) forms of GIP/GLP-1 must be measured to study its secretion and processing in vivo.

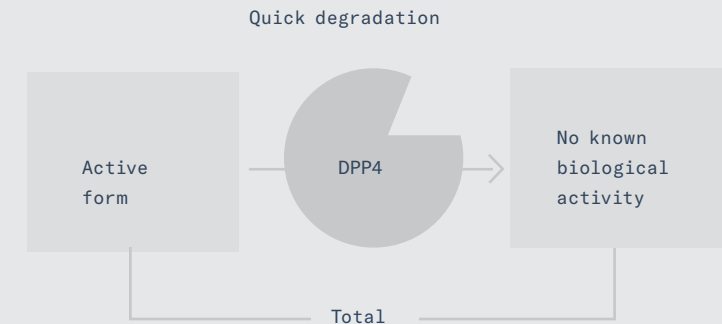


Figure 1. DPP4-mediated degradation of GIP/GLP-1.

## Why the amidated forms of GLP-1?

Since the predominating form of GLP-1 in humans is (9-36) amide, it is very important that this isoform is measured at 100 %<sup>2</sup>. If the method used has a low cross-reactivity to the predominating metabolite, the results will be underestimated and there is a risk that fluctuations and changes in plasma concentrations will not be accurately detected (see figure 2).

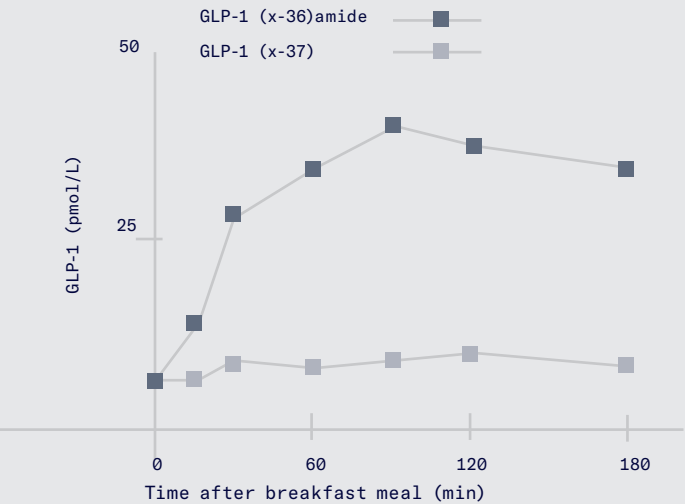


Figure 2. GLP-1 response to a breakfast meal (n = 6) as measured with an antibody specific for amidated GLP-1, (x-36), and an antibody specific for glycine-extended GLP-1, (x-37). GLP-1 immunoreactivity in plasma in pmol/L is plotted against time (min). Picture modified from Ørskov et al., Diabetes 1994<sup>3</sup>.

Product	Issue	Mercodia Solution
GLP-1/GIP	How can I get an overview of secretion?	Assays that detect total GLP-1/GIP
	Levels can be very different in different patients!	Assay with chemiluminescence detection method gives broad measuring range
GLP-1	There are several isoforms, which should I measure?	Excellent specificity to the most abundant isoforms including GLP-1(9-36) amide.
GIP	Circulating levels of GIP are very low, but can rise a lot after a meal!	Assay with chemiluminescence detection method gives broad measuring range
Glicentin	Difficult to distinguish from other proglucagon peptides	Assay constructed with unique, monoclonal antibodies

### References:

- Seino et al., Journal of Diabetes Investigation, 2010
- Ørskov, et al., J Biol Chem 1989
- Ørskov et al., Diabetes 1994

## Northern Lights

Mercodia Northern Lights is a product line that employs chemiluminescence as the method for detection. This sensitive detection makes it possible to push the measuring range to very low concentrations while still being able to detect high levels. This allows the Total GIP NL-ELISA to detect levels down to 2.7 pmol/L and the total GLP-1 NL-ELISA down to 0.9 pmol/L with high precision.

## Mercodia Assays for Gut Hormones

Catalog no	Product Name	Sample Volume	Range
GLP-1			
10-1278-01	Total GLP-1 NL-ELISA	25 µL	0.9-940 pmol/L
GIP			
10-1258-01	Total GIP NL-ELISA	25 µL	2.7-1000 pmol/L
Glicentin			
10-1273-01	Glicentin ELISA	25 µL	3-300 mU/L

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