

Anti-GLP-1: Rabbit Glucagon-like peptide-1 Antibody

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BACKGROUND

The GLPs belong to a larger family referred to as the glucagon superfamily of peptide hormones. These hormones are classified within this family based on their considerable sequence homology with glucagon. Included in this family are: glucagon, GLP-1(7-37) and -(7-36)amide, GIP, exendin-3 and -4, secretin, peptide histidine-methionine amide (PHM), GLP-2, helospectin-1 and -2, helodermin, pituitary adenylyl cyclase-activating polypeptides (PACAP)-38, and -27, PACAP-related peptide (PRP), GH-releasing factor (GRF), and vasoactive intestinal polypeptide (VIP). These peptide hormones are produced in the gut, pancreas, and the central and peripheral nervous systems and exhibit a wide variety of biological actions in which several act as neurotransmitters. The preproglucagon consists of the glicentin-specific peptide and followed in order by the sequences that encode glucagon, GLP-1, and GLP-2. The glucagon, GLP-1, and GLP-2 sequences are interrupted by short spacer sequences that encode intervening peptides. Several of the enzymes that posttranslationally cleave proproteins into peptides or hormones have been identified. These enzymes comprise a family known as subtilisins or subtilisin-like proprotein convertases, otherwise known as prohormone convertases (PCs). Notably, even peptide hormones that are co-encoded within the same precursor, such as the peptide hormones derived from the cleavages of preproglucagon, differ significantly in the physiological processes that they regulate. For example, the major function of glucagon is to maintain blood glucose levels during fasting, whereas GLP-1 functions primarily during feeding to stimulate insulin release and to lower blood glucose levels. On the other hand, GLP-2 appears to regulate the growth of intestinal epithelial cells.¹

GLP-1 is a potent stimulator of glucose-dependent insulin release. The binding of GLP-1 to its receptor on beta cells activates adenylyl cyclase, resulting in the formation of cAMP. Binding of cAMP to the regulatory (R) subunit of PKA results in the release of the active catalytic subunit. The active kinase then translocates to the nucleus and phosphorylates, and therefore activates, the nuclear transcriptional activator CREB bound to the CRE located in the promoter of the proinsulin gene. This cascade of signaling results in a stimulation of transcription of the proinsulin gene and increased insulin biosynthesis to replenish stores of insulin secreted in response to nutrients (glucose) and incretins.² Leptin, the obesity hormone produced by adipose tissue, has opposing actions to GLP-1 on pancreatic beta-cells. Leptin suppresses insulin secretion and gene expression, both of which are stimulated by GLP-1. However, it is worth noting that the inhibition of insulin secretion by leptin may be overridden by GLP-1, thereby assuring adequate insulin secretion in response to meals. The feedback loop between leptin (fat) and insulin (pancreatic beta-cells) constitutes an adipoinsular axis.³ In addition, GLP-1 plays important roles on gastric motility and the suppression of plasma glucagon levels. It may be involved in the suppression of satiety and stimulation of glucose disposal in peripheral tissues, independent of the actions of insulin. GLP-1 has growth-promoting activities on intestinal epithelium. It may also regulate the hypothalamic pituitary axis (HPA) via effects on LH, TSH, CRH, oxytocin, and vasopressin secretion. Moreover, GLP-1 increases islet mass through stimulation of islet neogenesis and pancreatic beta cell proliferation and inhibits beta cell apoptosis.⁴



GLP-1 polypeptides (5ng/lane) in Western blot. Bottom: This antibody stains paraffin-embedded human pancreas tissue in immunohistochemical analysis.

REFERENCES

1. Kieffer, T.J. & Habener, J.F.: Endocr. Rev. 20: 876-913, 1999
2. Doyle, M.E. & Egan, J.M.: Pharmacol Ther. 113: 546-593, 2007
3. Mannucci, E. et al: Diabetes Care 24:489-494, 2001
4. Drucker, D.J.: Mol. Endocrinol. 17:161-71, 2003

Antigen:	Short peptide from human GLP-1 sequence.
Isotype:	Rabbit IgG
Species & predicted species cross-reactivity ():	Human, Mouse, Rat
Applications & Suggested starting dilutions:*	WB 1:500 - 1:1000 IP 1:100 IHC 1:200 ICC n/d FACS n/d
Predicted Molecular Weight of protein:	4 kDa
Specificity/Sensitivity:	Detects endogenous GLP-1 polypeptides without cross-reactivity with other family members.
Storage:	Store at -20°C, 4°C for frequent use. Avoid repeated freeze-thaw cycles.

**** Products are for research use only. They are not intended for human, animal, or diagnostic applications. ****

Product Information

- Catalogue number: PB-CG1174
- Size: 100 µl

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