
GLUCAGON ELISA.
HYPOGLYCEMIA DETECTION.
TECAN.

GLUCAGON: CENTRAL TO UNDERSTANDING HYPERGLYCEMIA.

Glucagon is a hormone produced by the alpha cells of the pancreas that plays a crucial role in regulating blood glucose levels by promoting the release of glucose from the liver into the bloodstream. It is interesting because it works in opposition to insulin, providing a balance in blood sugar management, which is essential for maintaining energy levels and preventing conditions like hypoglycemia. Additionally, glucagon's role in glucose metabolism makes it a target for research in diabetes treatment (Jiang & Zhang, 2003; Rix et al., 2015).[1, 2]

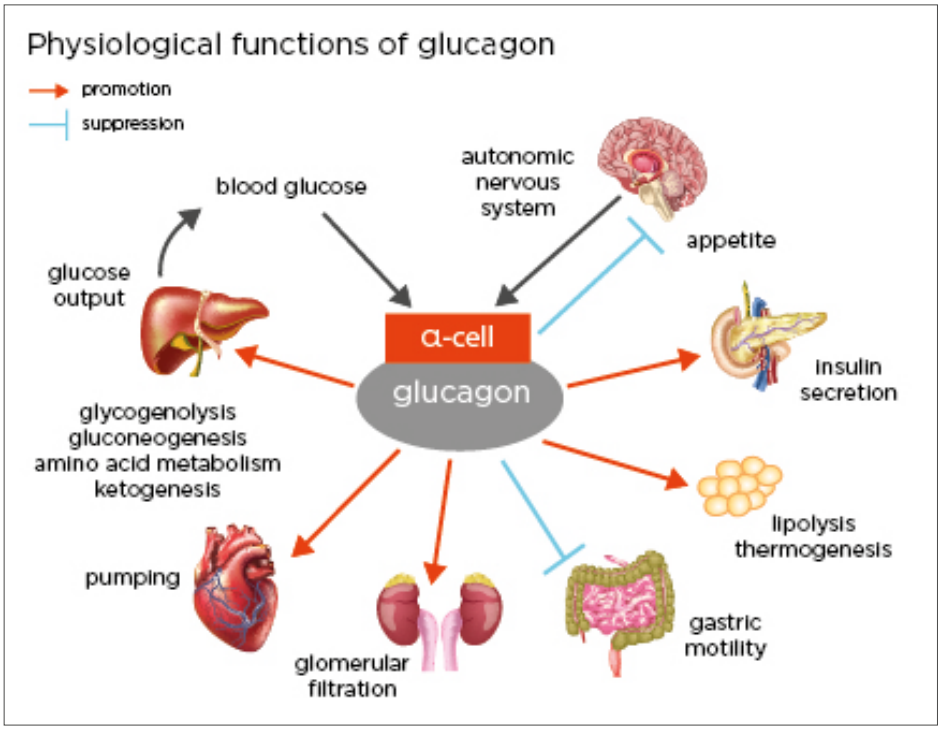

Figure 1: Glucagon's Diverse Roles in Metabolic Pathways and Physiological Processes (adapted from Kawamori & Shugo, 2023)

Glucagon: a multifaceted hormone influencing metabolism and physiological functions.

Glucagon influences several metabolic processes, including glycogenolysis and gluconeogenesis, where it stimulates the liver to convert stored glycogen and non-carbohydrate substrates into glucose, respectively. It also affects amino acid metabolism, ketogenesis, and lipolysis, promoting the breakdown of fats and proteins for energy, while modulating insulin secretion and impacting the autonomic nervous system to regulate appetite, gastric motility, and heart function. Additionally, glucagon can enhance glomerular filtration in the kidneys, contributing to its diverse physiological roles.

Hypoglycemia diagnosis with Glucagon ELISA.

- **Accurate measurement:** Reliably detects low glucagon levels that other tests might miss. (0-352 pg/mL)
- **Enhanced diagnostic precision:** Identifies patients with suspected hypoglycemia for improved clinical outcomes (Sensitivity: LoD 2.27 pg/mL).
- **Proven performance:** Validated through comparative studies with a National Reference Laboratory, ensuring high standards and reliability.
- **Expanded insights:** Enhances understanding of glucagon's involvement in the glucagon-centric theory, which posits that glucagon plays a crucial role in metabolic regulation by influencing glucose homeostasis and energy balance.
- **Automatable:** Enables high throughput processing

Diseases involving glucagon.

- **Diabetes mellitus**
  - Glucagon levels can be dysregulated in diabetes, contributing to hyperglycemia
- **Hypoglycemia**
  - Glucagon is used therapeutically to treat severe hypoglycemia by increasing blood glucose levels
- **Metabolic disorders**
  - Abnormal glucagon levels can be involved in various metabolic disorders affecting glucose homeostasis. (Hædersdal et al., 2023)[4]

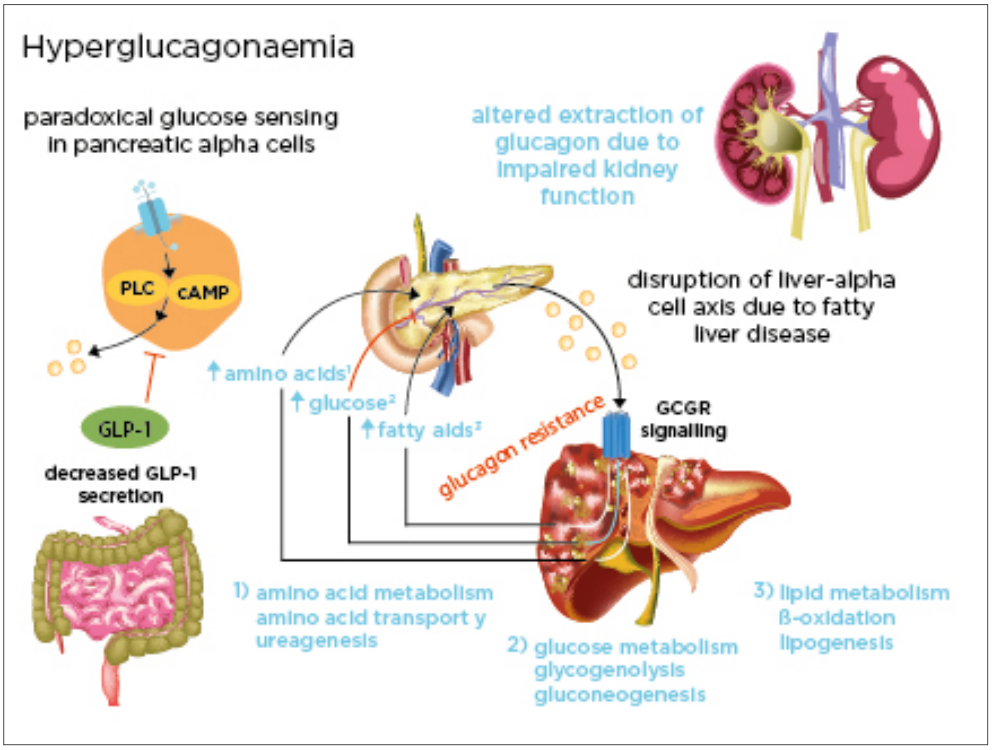

Figure 2: Hyperglucagonaemia: Exploring the multifaceted causes and consequences, including impaired glucagon sensitivity in fatty liver disease, paradoxical alpha cell responses, and potential organ extraction inefficiencies (Albrechtsen et al., 2023).[5]

Properties and benefits.

- **Performance data**: Quantitative measurement of glucagon in human plasma (EDTA)
  - **Assay range:** 6.7-66.6 pg/mL, n=124, fasting
- **Offers high sensitivity and specificity for accurate glucagon measurement**
  - **High sensitivity:** LoD 2.27 pg/mL; LoQ 5.33 pg/mL. CV < 20%
- **Sample type:** Requires EDTA plasma
- **Assay time 1.75 h**
- **Cross-reactivity:** No detectable cross-reactivity for 21 cross-reactants tested
- **Provides reliable and reproducible results**
  - n=75, 3 lots x 5 testing days x 5 replicates, CV 2.5-11.8%
- **Supports clinical decision-making**
  - Repeatability: n=80, 20 testing days x 2 runs x 2 replicates, CV ≤ 5.6%
  - Commutability: correlation between Glucagon ELISA and National Reference Laboratory, R2 = 0.94

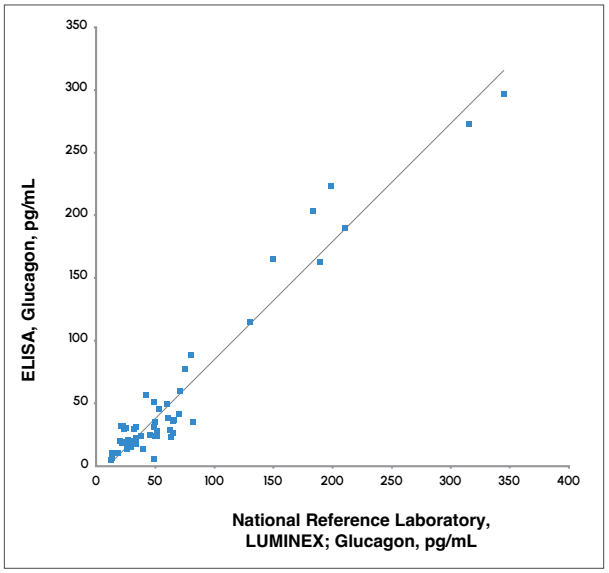

Figure 3: Significant commutability between Glucagon ELISA and National Reference Laboratory.

Our available products for your metabolic health diagnostic and research.

Cat #	Product	Reg. Status
30253372	Insulin ELISA	IVD
30253368	C-Peptide ELISA	IVD
30221798	Active B12 ELISA	IVD
30257154	Glucagon ELISA	IVD

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References

1. Jiang, G., & Zhang, B. B. (2003). Glucagon and regulation of glucose metabolism. American journal of physiology-endocrinology and metabolism, 284(4), E671-E678.
2. Rix, I., Nexøe-Larsen, C., Bergmann, N. C., Lund, A., & Knop, F. K. (2015). Glucagon physiology.
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4. Wewer Albrechtsen, Nicolai & Holst, Jens & Cherrington, Alan & Finan, Brian & Gluud, Lise & Dean, Danielle & Campbell, Jonathan & Bloom, Stephen & Tan, Tricia & Knop, Filip & Müller, Timo. (2023). 100 years of glucagon and 100 more. Diabetologia. 66. 1-17. 10.1007/s00125-023-05947-y.
5. Hædersdal, S., Andersen, A., Knop, F. K., & Vilsbøll, T. (2023). Revisiting the role of glucagon in health, diabetes mellitus and other metabolic diseases. Nature Reviews Endocrinology, 19(6), 321-335.

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IBL International GmbH
Flughafenstrasse 52a
22335 Hamburg
Germany

Phone: +49 (0)40-53 28 91-0
Fax: +49 (0)40-53 28 91-11
Email: IBL@Tecan.com
www.tecan.com/ibl

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