

Meet the Marker: Glucagon

Meet the Marker: Glucagon

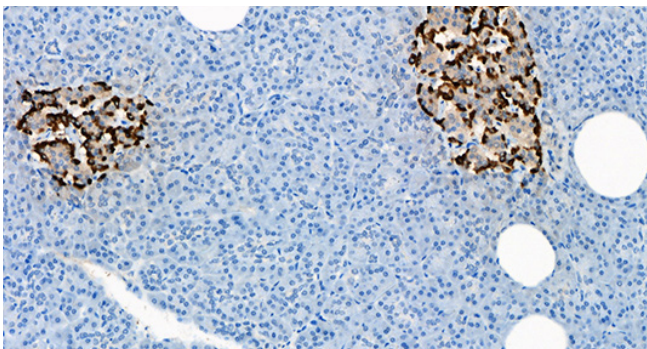
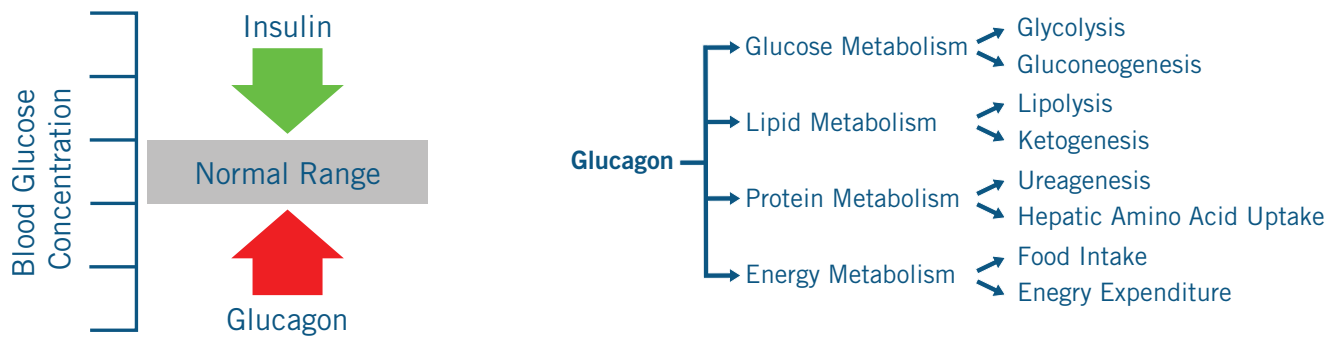
Glucagon (shorthand for Glucose-Agonist) is a peptide hormone secreted by pancreatic alpha cells that stimulates hepatic glucose production and increases plasma glucose levels.² Glucagon acts as a counter-regulatory hormone to insulin, and its secretion is regulated by a complex interaction of nutrient, neural, and hormonal factors.² The body depends on a balanced secretion of glucagon from pancreatic alpha cells and insulin from pancreatic beta cells in order to maintain proper blood sugar balance, with glucagon increasing blood sugar levels and insulin decreasing them.²

In relation to cancer, research has found a pronounced difference in the glucagon to insulin ratio in patients with pancreatic ductal adenocarcinoma (PDAC).¹ This is of great significance since PDAC is one of the most aggressive malignancies with the poorest prognosis. Overall, PDAC has a 5-year survival rate of less than 5%, with much of that poor outlook attributed to late-stage diagnosis.¹ If PDAC can be identified earlier, it may improve survivability.

Studies have also found that glucagon significantly promotes colon cancer cell growth by binding glucagon receptors in colon cancer cell lines and colon cancer tissue.⁵ However, the mechanism by which this occurs is still not well understood.⁵

In rare cases, a patient may develop glucagonoma, a rare type of neuroendocrine tumor of the pancreatic islets that secrete glucagon.³ Excessive secretion of glucagon from the tumor leads to glucagonoma syndrome, causing weight loss, necrolytic migratory erythema, diabetes, and mucosal abnormalities such as stomatitis, cheilitis, and glossitis.³ Glucagonomas tend to be slower growing but are typically not detected until they are at an advanced stage.³

Glucagon Illustrations



Pancreas stained with Glucagon antibody

Biocare offers Glucagon in both concentrated and ready-to-use formats, including formats for the ONCORE Pro, Leica BOND III, and Roche BenchMark ULTRA.* For more information, please visit our website at biocare.net or call 1-800-799-9499.

*Q Series and Ultraline antibodies are developed solely by Biocare Medical LLC and do not imply approval or endorsement of Biocare antibodies by Leica Biosystems or Roche Tissue Diagnostics. Biocare Medical is not affiliated, associated, or related in any way with Leica Biosystems or Roche Tissue Diagnostics.

1. Kolb, A., Rieder, S., Born, D., Giese, N. A., Giese, T., Rudofsky, G., Werner, J., Büchler, M. W., Friess, H., Esposito, I., & Kleeff, J. (2009). Glucagon/insulin ratio as a potential biomarker for pancreatic cancer in patients with new-onset diabetes mellitus. *Cancer biology & therapy*, 8(16), 1527–1533. <https://doi.org/10.4161/cbt.8.16.9006>

2. Lund, A., Bagger, J. I., Christensen, M., Knop, F. K., & Vilsbøll, T. (2014). Glucagon and type 2 diabetes: the return of the alpha cell. *Current diabetes reports*, 14(12), 555. <https://doi.org/10.1007/s11892-014-0555-4>

3. Sandhu S, Jialal I. Glucagonoma Syndrome. [Updated 2022 Mar 21]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK519500/>

4. Scott, R. V., & Bloom, S. R. (2018). Problem or solution: The strange story of glucagon. *Peptides*, 100, 36–41. <https://doi.org/10.1016/j.peptides.2017.11.013>

5. Yagi, T., Kubota, E., Koyama, H., Tanaka, T., Kataoka, H., Imaeda, K., & Joh, T. (2018). Glucagon promotes colon cancer cell growth via regulating AMPK and MAPK pathways. *Oncotarget*, 9(12), 10650–10664. <https://doi.org/10.18632/oncotarget.24367>