

PROINSULIN INTACT ELISA.



UNLOCK THE FUTURE OF DIABETES DETECTION: PROINSULIN INTACT ELISA FOR EARLY AND ACCURATE DIAGNOSIS.

PRODUCT

RE53061

Proinsulin Intact ELISA

Proinsulin, primarily produced in pancreatic β -cells, undergoes processing into insulin and C-peptide. While typically found in low concentrations in plasma of healthy individuals, insulin resistance (IR) or hyperglycemia prompts increased insulin secretion, leading to a disruption in secretion patterns. Consequently, plasma levels of intact proinsulin rise while insulin levels drop, serving as a specific biomarker for β -cell dysfunction and IR, also independently correlating with cardiovascular disease risk.

In clinical practice, fasting morning intact proinsulin emerges as a highly specific indicator of relevant insulin resistance and β -cell dysfunction, causative of type 2 diabetes. It can be used in guiding insulin resistance therapy selection and monitoring therapeutic efficacy on β -cell function. Elevated fasting intact proinsulin levels signify insulin resistance and potential prediabetes, urging proactive treatment to mitigate cardiovascular risks.

During the oral glucose tolerance test, 2-hour intact proinsulin levels emerge as a robust predictor of future type 2 diabetes development, often preceding detectable glucose, HbA1c, and insulin changes by up to 4 years. Elevated fasting intact proinsulin levels may also signal conditions like insulinoma or precede type 1 diabetes manifestation.^{1,2}

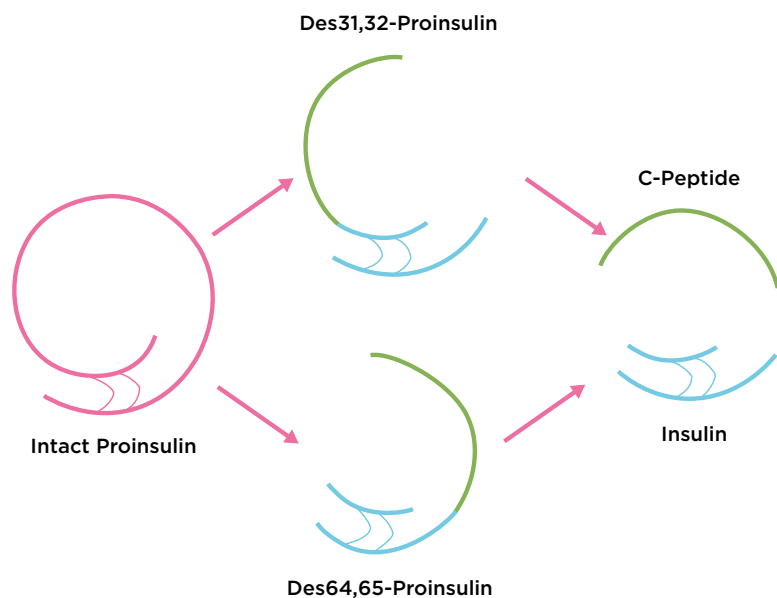


Figure 1: Intact versus total proinsulin.

- Total proinsulin = Intact proinsulin plus cleavage fragments (des32,33)
- Cleavage products are stable for hours, can be up to 30-50% of total proinsulin
- Exclude any possible reason for cleavage products (e.g. intake of fat food hours before blood collection)
- Intact proinsulin allows a better functional assessment of the β -cell activity / dynamic

Transform diabetes detection with Proinsulin Intact ELISA.

- **Early detection:** Intact proinsulin indicates type 2 prediabetes before glucose changes. It predicts type 2 diabetes up to 4 years before clinical diagnosis.
- **Insight into insulin resistance:** Elevated intact proinsulin levels offer valuable information on insulin resistance, contributing to a comprehensive understanding of metabolic health.

- **Diagnostic accuracy:** The ELISA kit distinguishes itself by measuring intact proinsulin with high specificity, avoiding potential confounding factors present in total proinsulin assays.
- **Clinical utility:** Widely employed in reputable research and clinical studies^{3,4}, Proinsulin Intact ELISA is recognized for its clinical relevance and reliability.

Intact proinsulin indicates **type 2 prediabetes** before glucose changes are detectable.

It can predict type 2 diabetes (T2D) development up to 4 years before clinical diagnosis. Glucose, insulin and HbA1c cannot detect prediabetes and predict later T2D development.

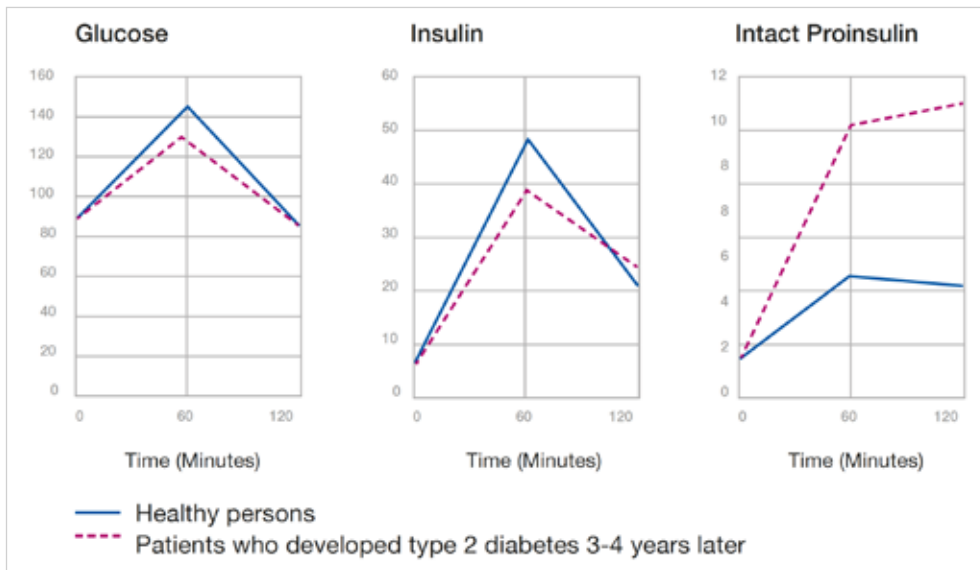


Figure 2: Glucose, insulin and intact proinsulin profiles in oral glucose tolerance test (OGTT) for patients who developed T2D within 4 years from this test. Results are compared to healthy persons who did not develop T2D.

- Only intact proinsulin predicts later T2D development.⁵
- Glucose in mg/dl; insulin in $\mu\text{U/ml}$; intact proinsulin in pmol/l.

Choose Proinsulin Intact ELISA (RE53061)* for:

- **Trusted results:** Calibrated with the latest WHO Standard 09/296.⁶
- **Precision matters:** Proven performance in external ring trial (published by INSTAND).
- **Ease of use:** Test can be performed within 3 hours.

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References

1. Pfützner, A., Hermanns, I., Ramljak, S., Demircik, F., Pfützner, A. H., Kann, P. H., & Weber, M. M. (2015). Elevated intact proinsulin levels during an oral glucose challenge indicate progressive β -cell dysfunction and may be predictive for development of type 2 diabetes. *Journal of Diabetes Science and Technology*, 9(6), 1307-1312.
2. Vangipurapu, J., Stančáková, A., Kuulasmaa, T., Kuusisto, J., & Laakso, M. (2015). Both fasting and glucose-stimulated proinsulin levels predict hyperglycemia and incident type 2 diabetes: a population-based study of 9,396 Finnish men. *PLoS One*, 10(4), e0124028.
3. Sims, E. K., Geyer, S. M., Long, S. A., & Herold, K. C. (2023). High proinsulin: C-peptide ratio identifies individuals with stage 2 type 1 diabetes at high risk for progression to clinical diagnosis and responses to teplizumab treatment. *Diabetologia*, 1-9.
4. Sims, E. K., Bundy, B. N., Stier, K., Serti, E., Lim, N., Long, S. A., ... & Type 1 Diabetes TrialNet Study Group. (2021). Teplizumab improves and stabilizes beta cell function in antibody-positive high-risk individuals. *Science translational medicine*, 13(583), eabc8980.
5. Pfützner A, Sachenheimer D, Lier A. Erhöhtes intaktes Proinsulin als früher Hinweis auf einen zukünftigen Typ-2-Diabetes. *Diabetes, Stoffwechsel und Herz* Band 27, Feb 2018
6. WHO Expert Committee on Biological Standardization, & World Health Organization. (2014). WHO international collaborative study of the proposed 1st international standard for human proinsulin (No. WHO/BS/2014.2237). World Health Organization.

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