Recombinant Human Proinsulin
Catalog Number: 1336-PN

DESCRIPTION

Source E. coli-derived
Phe25-Asn110, with an N-terminal Met, 6-His tag and Lys
Accession # NP_000198

N-terminal Sequence Analysis
Predicted Molecular Mass 10.5 kDa

SPECIFICATIONS

SDS-PAGE 9 kDa, reducing conditions
The ED50 for this effect is 0.15-0.75 μg/mL.

Endotoxin Level <0.01 EU per 1 μg of the protein by the LAL method.
Purity >95%, by SDS-PAGE under reducing conditions and visualized by silver stain.
Formulation Lyophilized from a 0.2 μm filtered solution in PBS. See Certificate of Analysis for details.

PREPARATION AND STORAGE

Reconstitution Reconstitute at 100 μg/mL in sterile PBS.
Shipping The product is shipped at ambient temperature. Upon receipt, store it immediately at the temperature recommended below.
Stability & Storage Use a manual defrost freezer and avoid repeated freeze-thaw cycles.
- 12 months from date of receipt, -20 to -70 °C as supplied.
- 1 month, 2 to 8 °C under sterile conditions after reconstitution.
- 3 months, -20 to -70 °C under sterile conditions after reconstitution.

BACKGROUND

Proinsulin is synthesized as a single chain, 110 amino acid (aa) preproprecursor that contains a 24 aa signal sequence and an 86 aa proinsulin propeptide. Following removal of the signal peptide, the proinsulin peptide undergoes further proteolysis to generate mature insulin, a 51 aa disulfide-linked dimer that consists of a 30 aa B chain (aa 25 - 54) bound to a 21 aa A chain (aa 90 - 110). The 34 aa intervening peptide (aa 55 - 89) that connects the B and A chains is termed the C-peptide.

Human proinsulin shares 84% and 80% aa sequence identity with rat and bovine proinsulin, respectively. Most of the sequence variation between species occurs in the region of the C-peptide (1). This peptide generates a structural conformation that allows for the correct formation of the intrachain disulphide bonds (1). Insulin is a molecule that facilitates the cellular uptake of glucose. This is accomplished by regulating the appearance of membrane glucose transporters. Low insulin levels or lack of insulin are associated with type 2 and type 1 diabetes mellitus, respectively. These conditions are associated with an increased risk for microvascular complications such as retinopathy, nephropathy, and peripheral neuropathy (3). Proinsulin also circulates, but its physiologic role is less well understood. It does possess about 25% of the activity of mature insulin, but it would seem unlikely to be a natural substitute for insulin (4). In type 2 diabetes, an elevated proinsulin to insulin ratio in the circulation is a well-known abnormality (5 - 9). Perhaps this abnormality represents either compromised proteolytic processing or a general inability to process increased levels of insulin precursor (5). In any event, proinsulin will stimulate amylin secretion by β-cells, and amyloid formation in pancreatic islets that promotes decreased β cell function (10). Studies also suggest that fasting serum proinsulin may be a better predictor of future type 2 diabetes than fasting insulin levels in obese children (11).

References: