

Gene-Modulating Peptides for Diabetes Management

Technology Domain: Peptide Chemistry

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Status (Patent/TRL): Patent Pending / TRL 4

Technology Summary:

This invention introduces novel therapeutic peptides and compositions designed to combat diabetes and its complications. The key technical solution involves specific short-chain peptides (di- to tetrapeptides) with a defined amino acid structure, notably including Tyr-Tyr (YY), Lys-Asn-Trp-Tyr (KNWY), and Gln-Asn-Trp-Tyr (QNWY). The key inventive feature is their ability to enhance insulin secretion by specifically upregulating the expression of critical insulin signaling genes: Insulin Receptor (IR), Insulin Receptor Substrate-1 (IRS-1), and Glucose Transporter 2 (GLUT2).

Results from *in vitro* studies on pancreatic cells demonstrated significant improvements in cell viability and insulin levels, alongside the confirmed upregulation of these target genes, particularly with peptides like YY and QNWY. The use of these peptides and compositions is for managing, preventing, or treating diabetes and its associated complications, offering a novel therapeutic approach by directly modulating the underlying genetic pathways of insulin signaling.

