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**Levetan**

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(54) **GENERATION OF NEW PANCREATIC BETA CELLS**

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CPC ..... **A61K 38/08** (2013.01); **C07K 16/2839** (2013.01); **C07K 2317/34** (2013.01); **C07K 2317/75** (2013.01)

(58) **Field of Classification Search**  
None  
See application file for complete search history.

(56) **References Cited**

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(57) **ABSTRACT**

The present invention relates to novel therapies for treatment of new and existing type 1 and type 2 diabetes, PreDiabetes, Latent Autoimmune Diabetes of Adulthood, and diseases of insulin deficiency, beta cell deficiency, insulin resistance and impaired glucose metabolism. In particular, the present invention identifies common peptides within the human Reg1a, Reg1b, Reg3a and Reg4, as signaling peptides for beta cell generation acting through the human Reg Receptor on the surface of human pancreatic extra-islet tissue. This invention identifies a specific binding region of the Reg Receptor from which peptidomimetics and stimulating antibodies have been developed for the generation of new beta cells which may be administered directly to patients with said conditions including type 1 diabetes, type 2 diabetes, PreDiabetes and other conditions of beta cell deficiency, and provides specific methodology for protecting new beta cells generated for usage in type 1 diabetes and Latent Autoimmune Diabetes of Adulthood. This invention also provides for ex-vivo generation and delivery of beta cells utilizing the inventions described within.

**15 Claims, 22 Drawing Sheets**