Abstract in English

Pancreas is an endocrine tissue which affects many physiological processes in organism. It has been known for a long lime that the pancreatic beta cells secret insulin. However, there are more hormones and substances secreted from the beta cells, mainly peptides such as insulin-like growth factors IGF, shorter peptides like amylin and many more. Some of them have not been even identified. Among these pancreatic products Ch. Buchanan's group from Auckland University, New Zeland identified 34 amino acids long peptide called preptin in 2001. Its amino acid sequence is identical with part of the preform of insulin-like growth factor 2 chain. It has been discovered that preptin has effect on osteoblast proliferation and insulin secretion. Nowadays preptin is being studied like a potential osteoporosis cure thanks to its increasing effect on osteoblasts proliferation.

This thesis describes preparation and characterization of human and rat preptin and their two fragments (which contain amino acids 1-16 and 17-34) using solid-phase synthesis. The aim of the thesis is to test effects of rat preptin and its two fragments on insulin secretion in pancreatic beta cell line INS-1E. Part of the thesis is focused on binding assays of human preptin and its two fragments to IGF-1 receptor and also to insulin receptor. These assays are based on the competition between preptin and radioactively marked human insulin or radioactively marked IGF-1 to the binding sites of the receptors.

Keywords: preptin, insulin, IGF, IGF-1R, IR-A, pancreas

(In Czech)