

## **HISTORY OF INSULIN**

Dadomatov D.S., Zadneprovsky N.V., Strilets O.P., Strelnikov L.S.

The National University of Pharmacy, Kharkiv, Ukraine

dima.dadomatov@mail.ru

Insulin - a hormone peptide nature formed in the beta-cells of the islets of Langerhans of the pancreas. It has a multifaceted effect on metabolic processes in virtually all tissues. The main effect of insulin is to reduce glucose concentration in the blood. Lack of insulin in the blood is a key factor in the development of diabetes person.

In 1921, Canadian doctors were able to isolate insulin from the pancreas of the dog. This medication they introduced to test the dog, which was called "experimental" diabetes. Shortly after injection sick dog woke up, got to her feet and walked. In 1922, seriously ill with diabetes boy was introduced drug derived from bovine pancreas. The result was not only save lives, but also to stop the progressive disease. The only source for industrial use of insulin in those days was the pancreas of pigs and cattle.

Unfortunately, the first animal insulin preparations cause a number of serious complications in patients, namely accumulation of antibodies to insulin, various allergic reactions, a decrease in insulin sensitivity, which forced to a constant regulation of the administered dose. This was due to the fact that the porcine and bovine insulin differs from human amino acid composition: bovine - three amino acids, and pig - one, leading to difficulty in treatment.

Only with the development of molecular biology towards the end of the 20th century it possible to determine the structure of human insulin. An active industrial production of insulin, human-identical hormone. One of the ways to get which were the biotechnology and semi-synthetic. Until now, the above methods are outdated. With semi-synthetic method feedstock passes many stages of purification. The disadvantage in this case is dependent on the supply of raw materials from livestock farms. The process for obtaining insulin via biosynthesis is: selected human insulin gene inserted into the genome of *E. coli*, which rapidly synthesize proinsulin. At the moment, relevant biotechnological method of producing insulin, it has a number of advantages: the lack of dependence on raw materials from cattle farms, simple scaling process. Production of insulin using genetically modified organisms is an important issue of modern biotechnology, since this method produces insulin preparation of high purity, most identical to human insulin, high efficiency, and minimize the cost of production, which will reduce the cost of the drug that is currently time is very important to the consumer market in Ukraine.