

Module 4:Hormone-Behaviour Relationship

Lecture 23: Pancreas

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 Pancreas

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See video on web

Pancreas has the exocrine as well as endocrine parts. The islet cells are located within pancreas and contain alpha as well as beta cells. Insulin is secreted from the beta cells and it regulates cellular uptake of glucose. It also facilitates conversion of glucose to glycogen and excess glucose to fat. Hyperinsulinism results into hypoglycemia which is characterized by lack of glucose delivery to brain causing disorientation, unconsciousness or even death. Hypoinsulinism results into elevated glucose levels in blood and urine leading to Diabetes Mellitus. Over time diabetics experience vascular and neural problems. The alpha cells of the pancreas secrete glucagon. It facilitates cellular breakdown of glycogen.

The level of pancreatic secretion in the body affects our psychological processes. Interruption in insulin metabolism adversely affects the central nervous system (CNS) functions. Researchers have recently looked at insulin metabolism impairment in the brain considering it also responsible for Alzheimer disease (AD). The level of cerebrospinal fluid (CSF) in the AD patients is less whereas plasma insulin concentration is very high. The significance of insulin in the control of metabolism and growth of primary fetal brain cell cultures has been proven. The physiological processes such as energy homeostasis, central action on peripheral glucose metabolism, survival of neurons in adults, and reproductive endocrinology are regulated by insulin. It is also instrumental in preserving psychological processes such as learning and memory. The facilitatory effect of intranasal administration of insulin on working memory has also been reported. Recent studies have testified improvement in cognitive functions of AD patients due to insulin. Low CNS insulin level as well as excessively high CNS and plasma insulin levels have been implicated for the development of AD.

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