

Ghrelin: regulatory hormonal and metabolic aspects

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Growth hormone (GH) is regulated by two antagonistic hypothalamic hormones, GHRH and somatostatin, plus the liver-derived hormone IGF-I. The old name of somatotrophic hormone (STH) is more coherent than GH, as this hormone is tightly regulated by the metabolic milieu, and this regulation appears to be superimposed over the classical regulation by peptide hormones. Metabolic signals such as glucose, amino acids, free fatty acids and their by-products, such as keto-acids, as well as the energy balance status regulate the secretion of GH in a very relevant form. In turn, GH causes complex actions on the general metabolism of a given individual. The upshot of this picture is of one hormone whose actions are implicated in a dual action on somatic growth and in the regulation of general metabolism, and which is in turn, regulated by the energetic homeostasis of the individual. The recently discovered hormone, ghrelin may well be the bridge connecting somatic growth with general metabolism.

Ghrelin anticipates the initiation of meals and releases GH, thus one could share the teleological view that ghrelin integrates anabolic changes in the body. In catabolic situations, raised ghrelin levels may induce a combination of enhanced food intake, increased gastric emptying and food assimilation coupled with GH levels which would promote a prompt nutrient incorporation to muscles and to fat reserves. These actions of ghrelin are the opposite of leptin which reduces food intake and selectively eliminates fat mass. Thus, both peptides may act as physiological regulators of energy balance in a long range, and interestingly, both come from peripheral organs such as stomach or white adipose tissue. With the incorporation of ghrelin to the group of physiological regulators of GH, i.e., GHRH, somatostatin, IGF-I we are in the verge to understand the correct regulation of GH secretion that has been until now incompletely understood.

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