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The Influence of Gut Hormones in Obesity: Mechanisms and Therapeutic Implications

Christopher Moyah*

Department of Nutrition, Nutrition Obesity Research Center (NORC), Seattle, WA

***Corresponding Author:** Christopher Moyah, Department of Nutrition, Nutrition Obesity Research Center (NORC), Seattle, WA; E-mail: moyechristopher@gmail.com

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Description

The increasing prevalence of obesity has spurred intense research interest in the mechanisms that govern energy balance and appetite regulation. Among these mechanisms, gut hormones plays an important role in mediating the complex interaction between the gastrointestinal system and the central nervous system, influencing both metabolism and satiety. Understanding the interplay of gut hormones in obesity is critical for developing novel therapeutic strategies to combat this condition effectively. Gut hormones are bioactive peptides released by the enteroendocrine cells in the gastrointestinal tract in response to food intake. They communicate with the brain and other organs to regulate hunger, satiety and energy expenditure. Key hormones involved in this process include ghrelin, leptin, peptide YY (PYY) and Glucagon-like Peptide-1 (GLP-1). Each hormone has distinct functions and pathways that contribute to the regulation of appetite and metabolic processes [1].

Ghrelin, known as the "hunger hormone," is produced primarily in the stomach and stimulates appetite by signalling the hypothalamus. Its levels rise before meals and decrease postprandially, playing an important role in meal initiation. In individuals with obesity, ghrelin signaling can become dysregulated, leading to increased hunger and overeating, even in the presence of adequate energy stores [2]. Thus, targeting ghrelin pathways presents an opportunity for therapeutic intervention in obesity management. In contrast, leptin is secreted by adipose tissue and functions to inhibit appetite and promote energy expenditure. It communicates the status of fat stores to the brain, signaling satiety [3]. However, many obese individuals exhibit a phenomenon known as leptin resistance, where despite high circulating levels of leptin, the body's response to the hormone is blunted. This resistance contributes to the difficulty in regulating appetite and maintaining energy homeostasis, highlighting leptin's potential as a therapeutic target [4].

Peptide YY (PYY) and Glucagon-like Peptide-1 (GLP-1) are two additional gut hormones that play integral roles in promoting satiety. PYY is released from the intestines after eating and functions to reduce appetite while slowing gastric emptying [5]. GLP-1, on the other hand, enhances insulin secretion, inhibits glucagon release and also promotes feelings of fullness. Both hormones have garnered interest in obesity treatment due to their potential to regulate appetite and improve glucose metabolism [6]. GLP-1 receptor agonists, for instance, have been successfully used in treating type 2 diabetes and have shown promise in weight loss efforts, demonstrating their dual role in metabolic regulation. The therapeutic implications of understanding gut hormone interplay in obesity are intense. By manipulating gut hormone signaling pathways, it may be possible to develop effective pharmacological treatments that promote weight loss, improve metabolic health and restore normal appetite regulation. Researchers are analyzing several strategies, including hormone replacement therapies, receptor agonists and antagonists, as well as dietary interventions that enhance the natural secretion of these hormones [7].

Moreover, lifestyle factors, such as dietary composition and meal timing, significantly influence gut hormone levels. High-fiber diets, for example, have been shown to enhance the postprandial release of GLP-1 and PYY, supporting satiety and reducing overall caloric intake. Understanding and incorporating these dietary strategies into obesity management plans could further optimize therapeutic outcomes. The interaction of gut hormones represents a critical element in the pathophysiology of obesity. As researchers continue to resolve the complexities of gut-brain interactions, the potential for innovative, hormone-based therapies to combat obesity and its metabolic complications appears promising. By targeting specific hormones and understanding their interactions, we can develop a more effective framework for treatment and prevention, ultimately improving the health and well-being of individuals struggling with obesity [8]. Continued research in this area is essential to refine these strategies and translate findings into clinical practice [9,10].

References

1. Koliaki C, Liatis S, Dalamaga M, Kokkinos A (2020) The implication of gut hormones in the regulation of energy homeostasis and their role in the pathophysiology of obesity. Current obesity reports 9:255-271.
2. Sun L, Ma L, Ma Y, Zhang F, Zhao C (2018) Insights into the role of gut microbiota in obesity: Pathogenesis, mechanisms, and therapeutic perspectives. Protein Cell 9;397-403.
3. Rovella V, Rodia G, Di Daniele F, Cardillo C, Campia U (2021) Association of gut hormones and microbiota with vascular dysfunction in obesity. Nutrients 13:613.
4. Karra E, Batterham RL (2010) The role of gut hormones in the regulation of body weight and energy homeostasis. Molecular and cellular endocrinology 316:120-128.
5. Van Son J, Koekkoek LL, La Fleur SE, Serlie MJ, Nieuwdorp M (2021) The role of the gut microbiota in the gut–brain axis in obesity: Mechanisms and future implications. International Journal of Molecular Sciences 22:2993.
6. De Silva A, Bloom SR (2012) Gut hormones and appetite control: A focus on PYY and GLP-1 as therapeutic targets in obesity. Gut and Liver 6:10.
7. Delzenne NM, Cani PD (2011) Interaction between obesity and the gut microbiota: Relevance in nutrition. Annual review of nutrition 31:15-31.
8. Fukui H, Xu X, Miwa H (2018) Role of gut microbiota-gut hormone axis in the pathophysiology of functional gastrointestinal disorders. Journal of neurogastroenterology and motility 24:367.

9. Perry B, Wang Y (2012) Appetite regulation and weight control: The role of gut hormones. Nutrition diabetes 2:e26-e26.
10. Martin AM, Sun EW, Rogers GB, Keating DJ (2019) The influence of the gut microbiome on host metabolism through the regulation of gut hormone release. Frontiers in physiology 10:428.