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Sommario/riassunto	<p>Alteration in adequate energy balance maintenance results in serious disturbances such as obesity and its related metabolic disorders. In Mammals, energy balance is homeostatically controlled through hormonal and neuroendocrine systems which cooperation is based on cross-talk between central and peripheral signals. The hypothalamus as well as peripheral hormones among which adipokines from adipose tissue and thyroid hormones play a crucial role in energy homeostasis. Unraveling the physiological, cellular and molecular mechanisms through which hormonal and neuroendocrine systems regulate energy balance has been a long-standing challenge in biology and is now more necessary when considering the world-wide increasing prevalence of obesity. Indeed, recognizing and understanding the biochemical and nutrient signaling pathways contributing to the nervous and endocrine integration of physiological mechanisms involved in the normal and/or abnormal regulation of energy balance is fundamental also to the development of new, effective, and targeted treatments for obesity. Recent studies have highlighted the role of hypothalamic pro-opiomelanocortin-expressing neurons in the regulation of energy homeostasis by controlling energy expenditure and food intake. This is accomplished through a precise balance of production and degradation of a-melanocyte-stimulating hormone, an anorexigenic neuropeptide which is degraded to an inactive form unable to inhibit food intake by the key enzyme prolyl carboxypeptidase (PRCP), thus suggesting that</p>

pharmacologic approaches targeting PRCP may provide a novel and effective option for the management of obesity and its associated metabolic disorders. Indeed, efforts have been made to generate potent, brain-penetrant PRCP inhibitors. Weight loss due to negative energy balance is a goal for obese subjects not always reachable by dietary caloric restriction or increased physical activity. Lipid-lowering therapies have been suggested to have potential benefits, however, the establishment of comprehensive therapeutic strategies is still awaited. Recently, it has been reported that thyroid hormone (TH)- derivatives such as 3,5-diiodothyronine and 3-iodothyronamine possess interesting biological activities, opening new perspectives in thyroid physiology and TH derivatives therapeutic usage. Moreover, several studies, focusing on the interaction between thyroid hormone (TH), the autonomic nervous system and the liver, revealed an important role for the hypothalamus in the differential effects of TH on autonomic outflow to peripheral organs controlling energy balance. This Research Topic aims to give a comprehensive and integrate view of the factors involved in the endocrine and neuroendocrine signaling in energy balance regulation to highlight their involvement into physiological processes and regulatory systems as well as their perturbation during pathological processes.

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