Introduction

This special issue offers a timely update on molecules recently identified as key regulators of *Growth and Energy Balance*. These include factors that are produced in the brain such as neuropeptide Y, galanin-like peptide, histamine cytokines and products of pro-opiomelanocortin processing as well as humoral factors such as ghrelin and leptin. Recently identified factors, such as kisspeptin, also receive attention.

The articles contained in the issue highlight how growth hormone and its peptide regulators exert coordinated actions to control growth, metabolism, glucose homeostasis and appetite as well as reproduction and sleep. A major focus is the arcuate nucleus that appears to receive a range of signals from the periphery as well as other centers in the brain. This allows continual adaptation to maintain metabolic balance.

In order to achieve a balanced regulation of these functions, brain structures involved are organized as interactive neuronal networks integrating both internal (hormonal or immune signals) and external (environmental or psychosocial) factors. Stress hormones and cytokines

can also modulate the function of these networks, providing adaptive mechanisms. This permits the organism to cope in times of emergency with resetting the system during periods of stress or infection. Thus, response to physiological stimuli ensures energy availability under both normal and pathological conditions.

Systems controlling growth, reproduction and appetite operate in a synergic manner. Thus, particular neuronal systems within the brain are multifunctional, leading to the subordination of physiological parameters in response to endogenous and environmental challenges. The network allows adaptive processes for the entire organism, which may have evolved to overcome food shortage and emergency situations. This special issue emphasizes the central role that neuroendocrine systems play in the maintenance of homeostasis with special reference to the somatotrophic axis and the means by which growth and energy balance can be coordinated.

Claude Kordon
Iain Clarke