

Hunger Drives Life

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Abstract

Principles of contemporary neuroscience assert that signals arising from higher brain regions via orchestrated and synchronized activity of neuronal circuits regulate complex behaviors, while peripheral tissue functions are affected mainly by neuronal populations located in evolutionary conserved, deep brain nuclei. Studies emerging in the recent past challenge these notions and argue that brain regions, including the hypothalamus, associated with homeostatic regulation have more significant impact on complex behaviors and higher brain regions than previously assumed. For example, arcuate nucleus neurons co-producing Agouti-related peptide (AgRP), neuropeptide Y (NPY) and GABA, which are crucial for hunger, feeding and survival, affect development of cortical and subcortical regions and associated non-feeding behaviors. These neurons are located outside of the blood brain barrier sensing a multitude of signals arising from the periphery. The fundamental role of these neurons in conveying homeostatic cues to higher brain regions together with their crucial role in assuring that peripheral tissues are aligned with the necessities for the execution of behavior offer a novel conceptual framework for brain functions and dysfunctions.