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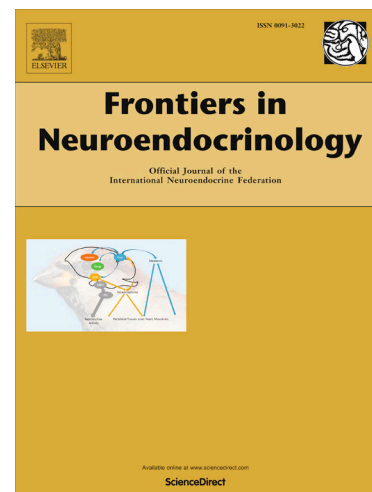
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## TRPCing around the Hypothalamus

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### Abstract

All of the canonical transient receptor potential channels (TRPC) with the exception of TRPC 2 are expressed in hypothalamic neurons and are involved in multiple homeostatic functions. Although the metabotropic glutamate receptors have been shown to be coupled to TRPC channel activation in cortical and sub-cortical brain regions, in the hypothalamus multiple amine and peptidergic G protein-coupled receptors (GPCRs) and growth factor/cytokine receptors are linked to activation of TRPC channels that are vital for reproduction, temperature regulation, arousal and energy homeostasis. In addition to the neurotransmitters, circulating hormones like insulin and leptin through their cognate receptors activate TRPC channels in POMC neurons. Many of the post-synaptic effects of the neurotransmitters and hormones are regulated in different physiological states by expression of TRPC channels in the post-synaptic neurons. Therefore, TRPC channels are key targets not only for neurotransmitters but circulating hormones in their vital role to control multiple hypothalamic functions, which is the focus of this review.

**Keywords:** TRPC channels, GnRH, kisspeptin, neurokinin B, POMC, orexin, 17 $\beta$ -estradiol, leptin, insulin

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