

OREXIN AND ENERGY HOMEOSTASIS REGULATION

Summary

The neuropeptide orexin stimulates food intake and energy expenditure by acting on two different receptors isoforms OXR1 and OXR2. Orexin exists in two isoforms, both of which bind to OXR1 and OXR2. Studies on genetic engineered animals, which lack or overexpress orexins or its cognate receptors revealed that orexin may play a role in controlling glucose homeostasis and body weight changes. Observational studies in narcoleptic humans, who display orexin deficiency, also indicate that orexin plays a role in the pathophysiology of type 2 diabetes mellitus and obesity. The results implicate that orexin may become an interesting therapeutic tool in alleviating metabolic

diseases and in controlling body weight. Indeed, application of exogenous orexin in narcoleptic humans alleviates the symptoms associated with the disease. Therefore it is important to broaden our understating about the physiological role of orexin as well as to further evaluate its potential in the context of pathophysiology of metabolic diseases. Our review focuses on the recent discoveries of orexin's role in regulating endocrine and metabolic functions *in vivo* and *in vitro*. In addition, it summarizes the accumulated knowledge about its possible involvement in the pathophysiology of two endemic metabolic diseases – type 2 diabetes mellitus and obesity.