遗传 » 2012, Vol. 34 » Issue (8) :969-976 DOI: 10.3724/SP.J.1005.2012.00969

RFRP-3对哺乳动物生殖功能和能量平衡的影响

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摘要 哺乳动物的生殖功能受体内状态和外部环境综合作用的影响, 这种综合作用通过作用于HPG轴的刺激因子和抑制因子之间的相对平衡来调控生殖。RFRP-3是目前下丘脑中唯一已知的HPG轴抑制因子。大量研究证实, RFRP-3能够抑制GnRH和LH的分泌, 进而影响生殖功能。然而, RFRP-3对LH分泌的抑制作用是发生在垂体水平还是下丘脑水平尚不清楚。此外, RFRP-3还可能参与了MLT对哺乳动物季节性繁殖调控的信号通路, 但是MLT对RFRP-3神经元的作用方式仍不清楚。此外, RFRP-3还可能在能量平衡和动物行为的调控中发挥着重要作用。文章就RFRP-3对HPG轴的调节机制以及其在能量平衡调节和行为调控中的作用进行了系统的阐述, 并针对目前尚待解决的一些问题进行了探讨。

关键词: RFRP-3 生殖功能 GnRH 能量平衡 季节性变化

Abstract: The hypothalamo-pituitary-gonadal (HPG) axis integrates internal and external cues via a balance of stimulatory and inhibitory neurochemical systems to regulate reproductive function in mammals. However, RFRP-3 is a unique inhibitor of HPG axis at the hypothalamuic level in mammals to date. A large number of previous studies have confirmed that RFamide-related peptide (RFRP-3) suppresses gonadotropin-releasing hormone (GnRH) system and luteinizing hormone (LH) secretion, thereby affecting the reproduction. However, whether the inhibition of LH secretion by RFRP-3 occurs at the pituitary level or the hypothalamus level is not clear. It is interesting that RFRP-3 is also related to signal pathway of melatonin modulating mammal seasonal reproduction, but little is known about the effects of melatonin on the RFRP-3 neuron up to now. In addition, RFRP-3 also plays an important role in the regulation of energy balance and behavior. The regulatory mechanism of RFRP-3 in HPG axis and role of RFRP-3 in modulating mammalian energy balance, as well as behavior, are systematically elaborated and the remaining unsolved problems are also discussed in this paper.

Keywords: RFRP-3, reproductive function, energy balance, gonadotropins, seasonal changes

收稿日期: 2012-01-06; 出版日期: 2012-08-25

基金资助:

国家现代农业产业技术体系建设专项基因(编号：CARS-39)和重庆市自然科学基金重点项目(编号： 2009BA1066)资助

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引用本文:

向伟，赖平，张宝云，王凭青，储明星，樊奇，刘重旭，谭颖. RFRP-3对哺乳动物生殖功能和能量平衡的影响. 遗传, 2012, 34(8): 969-976.

XIANG Wei, LAI Ping, ZHANG Bao-Yun, WANG Ping-Qing, CHU Ming-Xing, FAN Qi, LIU Chong-Xu, TAN Ying. Effects of RFRP-3 on reproductive function and energy balance in mammals. HEREDITAS, 2012,V34(8): 969-976.

链接本文:

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