



动物营养学报 » 2013, Vol. 25 » Issue (11) :2520-2528 DOI: 10.3969/j.issn.1006-267x.2013.11.003

综述 Review

[最新目录](#) | [下期目录](#) | [过刊浏览](#) | [高级检索](#)

<< Previous Articles | Next Article >>

食欲素调控机体糖代谢

王进宝, 王建林, 邵宝平

兰州大学生命科学院动物研究所, 兰州 730000

Orexin: Regulation in Body Glucose Metabolism

WANG Jinbao, WANG Jianlin, SHAO Baoping

Institute of Zoology, School of Life Science, Lanzhou University, Lanzhou 730000, China

- 摘要
- 参考文献
- 相关文章

Download: PDF (432KB) [HTML](#) (1KB) Export: BibTeX or EndNote (RIS) Supporting Info

摘要 下丘脑食欲素(orexin)是调节睡眠与觉醒、饮食行为、情感、自主神经活动以及全身糖代谢的主要神经肽之一。本文综述了下丘脑orexin在机体糖代谢平衡中的主要作用,阐述了orexin在糖代谢中的作用模式及其分子机制。

关键词: 食欲素 神经元 下丘脑 糖代谢

Abstract: Hypothalamic orexin are known to regulate sleep/wake, feeding behavior, emotions, autonomic nerve activity, and whole-body glucose metabolism. This review mainly discussed the main roles of orexin in glucose metabolism balance, and the action model and molecular mechanism in glucose metabolism.

Keywords: orexin, neuron, hypothalamus, glucose metabolism

收稿日期: 2013-05-08;

基金资助:

国家自然科学基金青年科学基金项目(31000190);中央高校基本科研业务费专项资金(860829)

通讯作者 邵宝平,副教授,硕士生导师,E-mail:shaobp@lzu.edu.cn Email: shaobp@lzu.edu.cn

引用本文:

王进宝, 王建林, 邵宝平 . 食欲素调控机体糖代谢[J]. 动物营养学报, 2013,V25(11): 2520-2528

WANG Jinbao, WANG Jianlin, SHAO Baoping . Orexin: Regulation in Body Glucose Metabolism[J]. Chinese Journal of Animal Nutrition, 2013,V25(2520-2528).

链接本文:

http://118.145.16.228/Jweb_dwy/CN/10.3969/j.issn.1006-267x.2013.11.003 或

http://118.145.16.228/Jweb_dwy/CN/Y2013/V25/I11/2520

Service

- ▶ 把本文推荐给朋友
- ▶ 加入我的书架
- ▶ 加入引用管理器
- ▶ Email Alert
- ▶ RSS

作者相关文章

- ▶ 王进宝
- ▶ 王建林
- ▶ 邵宝平

- [1] SAKURAL T.The neural circuit of orexin (hypocretin): maintaining sleep and wakefulness[J].Nature Reviews Neuroscience,2007,8(3):171-178.
- [2] TRIVEDI P,YU H,MACNEIL D J,et al.Distribution of orexin receptor mRNA in the rat brain[J].FEBS Letters,1998,438(1/2):71-75.
- [3] 赵玉岩,郭磊,都健,等.增食欲素受体I在大鼠胰岛细胞中的表达研究[J].中国医科大学学报,2008,37(3):304-306.
- [4] MORIGUCHI T,SAKURAI T,NAMBU T,et al.Neurons containing orexin in the lateral hypothalamic area of the adult rat brain are activated by insulin-induced acute hypoglycemia[J].Neuroscience Letters,1999,264(1/2/3):101-104.
- [5] YAMANAKA A,BEUCKMANN C T,WILLIE J T,et al.Hypothalamic orexin neurons regulate arousal according to energy balance in mice [J].Neuron,2003,38(5):701-713.

- [6] GRIFFOND B,RISOLD P Y,JACQUEMARD C,et al.Insulin-induced hypoglycemia increases preprohypocretin (*orexin*) mRNA in the rat lateral hypothalamic area[J].*Neuroscience Letters*,1999,262(2):77-80.
- [7] SCHULD A,HEBEBRAND J,GELLER F,et al.Increased body-mass index in patients with narcolepsy[J].*Lancet*,2000,355(9211):1274-1275.
- [8] HARA J,BEUCKMANN CT,NAMBU T,et al.Genetic ablation of orexin neurons in mice results in narcolepsy,hypophagia, and obesity [J].*Neuron*,2001,30(2):345-354.
- [9] MARINO J S,XU Y,HILL J W.Central insulin and leptin-mediated autonomic control of glucose homeostasis[J].*Trends in Endocrinology and Metabolism*,2011,22(7):275-285.
- [10] KARNANI M,BURDAKOV D.Multiple hypothalamic circuits sense and regulate glucose levels[J].*American Journal of Physiology: Regulatory, Integrative and Comparative Physiology*,2011,300(1):R47-R55.
- [11] BURDAKOV D,LUCKMAN S M,VERKHRATSKY A.Glucose-sensing neurons of the hypothalamus[J].*Philosophical Transactions of the Royal Society of London: Series B, Biological Sciences*,2005,360:2227-2235.
- [12] VENNER A,KARNANI M M,GONZALEZ J A,et al.Orexin neurons as conditional glucosensors: paradoxical regulation of sugar sensing by intracellular fuels[J].*Journal of Physiology*,2011,589(Pt 23):5701-5708.
- [13] BAIRD J P,CHOE A,LOVELAND J L,et al.Orexin-A hyperphagia: hindbrain participation in consummatory feeding responses [J].*Endocrinology*,2009,150(3):1202-1216.
- [14] YOSHIMICHI G,YOSHIMATSU H,MASAKI T,et al.Orexin-A regulates body temperature in coordination with arousal status[J].*Experimental Biology and Medicine (Maywood)*,2001,226(5):468-476.
- [15] TSUNEKI H,SUGIHARA Y,HONDA R,et al.Reduction of blood glucose level by orexins in fasting normal and streptozotocin-diabetic mice [J].*European Journal of Pharmacology*,2002,448(2/3):245-252.
- [16] INUI A.Transgenic approach to the study of body weight regulation[J].*Pharmacological Reviews*,2000,52(1):35-61.
- [17] HAYNES A C,CHAPMAN H,TAYLOR C,et al.Anorectic,thermogenic and anti-obesity activity of a selective orexin-1 receptor antagonist in mice[J].*Regulatory Peptides*,2002,104(1/2/3):153-159.
- [18] GRIFFOND B,RISOLD P Y,JACQUEMARD C,et al.Insulin-induced hypoglycemia increases preprohypocretin(*orexin*)mRNA in the rat lateral hypothalamic area[J].*Neuroscience Letters*,1999,262(2):77-80.
- [19] YOSHIMATSU H,NIIJIMA A,OOMURA Y,et al.Lateral and ventromedial hypothalamic influences on hepatic autonomic nerve activity in the rat[J].*Brain Research Bulletin*,1988,21(2):239-244.
- [20] PEYRON C,TIGHE D K,VAN DEN POL A N,et al.Neurons containing hypocretin(*orexin*)project to multiple neuronal systems[J].*Journal of Neuroscience*,1998,18(23):9996-10015.
- [21] HARRISON T A,CHEN C T,DUN N J,et al.Hypothalamic orexin A-immunoreactive neurons project to the rat dorsal medulla[J].*Neuroscience Letters*,1999,273(1):17-20.
- [22] KREIER F,BUIJS R M.Evidence for parasympathetic innervation of white adipose tissue, clearing up some vagaries[J].*American Journal of Physiology: Regulatory, Integrative and Comparative Physiology*,2007,293(1):R548-R549.
- [23] SHEN J,TANIDA M,YAO J F,et al.Biphasic effects of orexin-A on autonomic nerve activity and lipolysis[J].*Neuroscience Letters*,2008,444(24):166-171.
- [24] TANIDA M,NIIJIMA A,SHEN J,et al.Dose-different effects of orexin-A on the renal sympathetic nerve and blood pressure in urethane-anesthetized rats[J].*Experimental Biology and Medicine (Maywood)*,2006,231(10):1616-1625.
- [25] BASS J,TAKAHASHI J S.Circadian integration of metabolism and energetics[J].*Science*,2010,330:1349-1354.
- [26] ESTABROOK I V,MCCARTHY M T,KO E,et al.*Fos* expression in orexin neurons varies with behavioral state[J].*Journal of Neuroscience*,2000,20(5):1656-1662.
- [27] GOMPF H S,ASTON-JONES G.Role of orexin input in the diurnal rhythm of locus coeruleus impulse activity[J].*Brain Research*,2008,1224:43-51.
- [28] TAHERI S,SUNTER D,DAKIN C,et al.Diurnal variation in orexin A immunoreactivity and prepro-orexin mRNA in the rat central nervous system[J].*Neuroscience Letters*,2000,279(2):109-112.
- [29] DESARNAUD F,MURILLO-RODRIGUEZ E,LIN L,et al.The diurnal rhythm of hypocretin in young and old F344 rats[J].*Sleep*,2004,27(5):851-858.
- [30] LEININGER G M,OPLAND D M,JO Y H,et al.Leptin action via neuropeptides controls orexin, the mesolimbic dopamine system and energy balance[J].*Cell Metabolism*,2011,14(4):313-323.
- [31] SILVA J P,VON MEYENN F,HOWELL J,et al.Regulation of adaptive behaviour during fasting by hypothalamic Foxa2[J].*Nature*,2009,462:646-649.

[1] 张志岐, 束刚, 江青艳. 下丘脑对脂类的营养感应及其参与食欲调控的机制[J]. 动物营养学报, 2013, 25(7): 1395-1405

[2] 刘海燕, 杨振才. 水生龟鳖类糖代谢的研究进展[J]. 动物营养学报, 2013, 25(2): 263-267