PEPTIDES 28 (2007) 2435–2513

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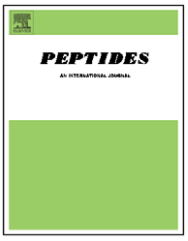

Review

Endogenous opiates and behavior: 2006

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ARTICLE INFO

Article history:
Received 22 August 2007
Accepted 6 September 2007
Published on line 11 September 2007

Keywords:
Endogenous opioids
Enkephalin
Endorphin
Dynorphin
Nociceptin
Endomorphin
Mu-opioid receptor
Delta-opioid receptor
Kappa-opioid receptor
ORL-1 opioid receptor

ABSTRACT

This paper is the 29th consecutive installment of the annual review of research concerning the endogenous opioid system, now spanning 30 years of research. It summarizes papers published during 2006 that studied the behavioral effects of molecular, pharmacological and genetic manipulation of opioid peptides, opioid receptors, opioid agonists and opioid antagonists. The particular topics that continue to be covered include the molecular–biochemical effects and neurochemical localization studies of endogenous opioids and their receptors related to behavior (Section 2), and the roles of these opioid peptides and receptors in pain and analgesia (Section 3); stress and social status (Section 4); tolerance and dependence (Section 5); learning and memory (Section 6); eating and drinking (Section 7); alcohol and drugs of abuse (Section 8); sexual activity and hormones, pregnancy, development and endocrinology (Section 9); mental illness and mood (Section 10); seizures and neurological disorders (Section 11); electrical-related activity and neurophysiology (Section 12); general activity and locomotion (Section 13); gastrointestinal, renal and hepatic functions (Section 14); cardiovascular responses (Section 15); respiration and thermoregulation (Section 16); and immunological responses (Section 17).

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Abbreviations: ACC, anterior cingulate cortex; Ach, acetylcholine; ACTH, adrenocorticotrophic hormone; AMSH, alpha-melanocyte-stimulating hormone; AS, antisense; BEND, beta-endorphin; BAM 22, bovine adrenal medulla 22; BAT, brown adipose tissue; BDNF, brain derived neurotrophic factor; BFNA, beta-funaltrexamine; BLPH, beta-lipotropin; BNST, bed nucleus of the stria terminalis; Ca(2+), calcium; cAMP, cyclic adenosine monophosphate; CART, cocaine and amphetamine-regulated transcript; CB, cannabinoid; CCK, cholecystokinin; cDNA, complementary deoxyribonucleic acid; CFA, complete Freund's adjuvant; CGRP, calcitonin gene-related peptide; ChAT, choline acetyltransferase; COX, cyclooxygenase; C/P, caudate/putamen; CPP, conditioned place preference; CREB, Ca(2+)/cAMP responsive element binding protein; CRF, corticotropin releasing factor; CS, conditioned stimulus; CSF, cerebrospinal fluid; CTAP, D-Phe-Cys-Tyr-D-Trp-Arg-Thr-Pen-Thr-NH_2; CWS, cold-water swims; DA, dopamine; DADL, D-Ala(2), D-Leu(5)-enkephalin; DALDA, D-Arg-Phe-Lys-NH_2; DAMGO, D-Ala(2), Nme(4), Gly-ol(5)-enkephalin; Delt, deltorphin; DOR, delta-opioid receptor gene; DPDPE, D-Pen(2), D-Pen(5)-enkephalin; DREAM, downstream regulatory element antagonistic modulator; DRG, dorsal root ganglion; DRN, dorsal raphe nucleus; DYN, dynorphin; Enk, enkephalin; EPSC, excitatory post-synaptic currents; ERK, extracellular regulated signal kinases; FMRI, functional magnetic resonance imaging; GI, gastrointestinal; GIRK, G-protein inwardly rectifying K^+ channel subunit; GnRH, gonadotropin-releasing hormone; GP, globus pallidus; HIV, human immunodeficiency virus; HPLC, high performance liquid chromatography; HR, heart rate; ICSS, intracranial self-stimulation; IPSC, inhibitory post-synaptic currents; JNK, Jun N-terminal kinase; K(+), potassium; KA, kainic acid; KO, knockout; KOR, kappa-opioid receptor gene; LC, locus coeruleus; Lenk, leu-enkephalin; LH, leutinizing hormone; LHA, lateral hypothalamic area; LI, like immunoreactivity; LiCl, lithium chloride; L-NAME, N(omega)-nito-L-arginine methyl ester; M3G, morphine-3-glucuronide; M6G, morphine-6-glucuronide; MAP, mean arterial pressure; MAPK, mitogen-activated protein kinase; MBH, medial-basal hypothalamus; ME, median eminence; Menk, met-enkephalin; MOR, mu-opioid receptor gene; MPOA, medial pre-optic area; MPTP.

0196-9781/$ – see front matter
doi:10.1016/j.peptides.2007.09.002

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1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine; MRI, magnetic resonance imaging; mRNA, messenger ribonucleic acid; NAC, nucleus accumbens; NalBzOH, naloxone benzoylhydrazone; NBNI, nor-binaltorphamine; NE, norepinephrine; NMDA, *N*-methyl-D-aspartate; NO, nitric oxide; NOS, nitric oxide synthase; NPY, neuropeptide Y; NRM, nucleus raphe magnus; NSAID, non-steroidal anti-inflammatory drug; NTI, naltrindole; NTS, nucleus tractus solitarius; OFQ/N, nociceptin; ORL-1, orphan receptor like receptor; Oxy, oxytocin; PAG, periaqueductal gray; PBN, parabrachial nucleus; PCPA, parachlorophenylalanine; PET, positron emission tomography; PGE, prostaglandin E; PKA, protein kinase A; PKC, protein kinase C; PLD2, phospholipase D2; POMC, pro-opiomelanocortin; PPE, pre-pro-enkephalin; PTSD, post-traumatic stress disorder; PTX, pertussis toxin; PVN, paraventricular nucleus; RSNA, renal sympathetic nerve activity; RVM, rostral ventromedial medulla; SCN, suprachiasmatic nucleus; 5HT, serotonin; SFO, sub-fornical organ; SG, substantia gelatinosa; SIV, simian immunodeficiency virus; SN, substantia nigra; SON, supraoptic nucleus; SP, substance P; SSRI, selective serotonin reuptake inhibitor; STZ, streptozotocin; TH, tyrosine hydroxylase; THC, tetrohydrocannibinol; VIP, vasoactive intestinal polypeptide; VMH, ventro-medial hypothalamic nucleus; VP, vasopressin; VTA, ventral tegmental area; WDR, wide dynamic range.