

PubMed

[Limits](#) [Advanced search](#) [Help](#)

[U.S. National Library of Medicine](#)
[National Institutes of Health](#)

[Display Settings:](#) [Abstract](#)

[Send to:](#)

ANNUAL REVIEWS
FULL-TEXT ARTICLE

[Annu Rev Pharmacol Toxicol.](#) 2006;46:101-22.

Cannabinoid receptors as therapeutic targets.

[Mackie K.](#)

Department of Anesthesiology and Physiology, University of Washington School of Medicine, Seattle, WA 98195-6540, USA. kmackie@u.washington.edu

Abstract

CB1 and CB2 cannabinoid receptors are the primary targets of endogenous cannabinoids (endocannabinoids). These G protein-coupled receptors play an important role in many processes, including metabolic regulation, craving, pain, anxiety, bone growth, and immune function. Cannabinoid receptors can be engaged directly by agonists or antagonists, or indirectly by manipulating endocannabinoid metabolism. In the past several years, it has become apparent from preclinical studies that therapies either directly or indirectly influencing cannabinoid receptors might be clinically useful. This review considers the components of the endocannabinoid system and discusses some of the most promising endocannabinoid-based therapies.

PMID: 16402900 [PubMed - indexed for MEDLINE]

[Publication Types, MeSH Terms, Substances, Grant Support](#)

Publication Types

- [Research Support, N.I.H., Extramural](#)
- [Review](#)

MeSH Terms

- [Amidohydrolases/metabolism](#)
- [Animals](#)
- [Biological Transport, Active/drug effects](#)
- [Cannabis/chemistry](#)
- [Drug Therapy*](#)
- [Endocannabinoids/metabolism](#)
- [Endocannabinoids/physiology*](#)
- [Humans](#)
- [Neuronal Plasticity/physiology](#)
- [Receptors, Cannabinoid/agonists](#)
- [Receptors, Cannabinoid/antagonists & inhibitors](#)
- [Receptors, Cannabinoid/drug effects*](#)

- [Tetrahydrocannabinol/pharmacology](#)

Substances

- [Endocannabinoids](#)
- [Receptors, Cannabinoid](#)
- [Tetrahydrocannabinol](#)
- [Amidohydrolases](#)
- [fatty-acid amide hydrolase](#)

Grant Support

- [DA 000286/DA/NIDA NIH HHS/United States](#)

[**LinkOut - more resources**](#)

Full Text Sources

- [Atypon](#)
- [EBSCO](#)
- [Swets Information Services](#)

Other Literature Sources

- [COS Scholar Universe](#)

Molecular Biology Databases

- [TETRAHYDROCANNABINOL - HSDB](#)

Related citations

- [Review Cannabinoids and the gut: new developments and emerging concepts.](#) [Pharmacol Ther. 2010]
- [Review Cannabinoid physiology and pharmacology: 30 years of progress.](#) [Neuropharmacology. 2004]
Review Cannabinoid physiology and pharmacology: 30 years of progress.
Howlett AC, Breivogel CS, Childers SR, Deadwyler SA, Hampson RE, Porrino LJ. Neuropharmacology. 2004; 47 Suppl 1:345-58.
- [Review The endocannabinoid system and its therapeutic exploitation.](#) [Nat Rev Drug Discov. 2004]
Review The endocannabinoid system and its therapeutic exploitation.
Di Marzo V, Bisbal M, De Petrocellis L. Nat Rev Drug Discov. 2004 Sep; 3(9):771-84.
- [Review The pharmacology of cannabinoid receptors and their ligands: an overview.](#) [Int J Obes (Lond). 2006]
Review The pharmacology of cannabinoid receptors and their ligands: an overview.
Pertwee RG. Int J Obes (Lond). 2006 Apr; 30 Suppl 1:S13-8.
- [Review The endogenous cannabinoid system and its role in nociceptive behavior.](#) [J Neurobiol. 2004]
Review The endogenous cannabinoid system and its role in nociceptive behavior.
Cravatt BF, Lichtman AH. J Neurobiol. 2004 Oct; 61(1):149-60.

[See reviews...](#) [See all...](#)

Cited by 49 PubMed Central articles

- [Chronic monoacylglycerol lipase blockade causes functional antagonism of the endocannabinoid system.](#) [Nat Neurosci. 2010] Chronic monoacylglycerol lipase blockade causes functional antagonism of the endocannabinoid system.
Schlosburg JE, Blankman JL, Long JZ, Nomura DK, Pan B, Kinsey SG, Nguyen PT, Ramesh D, Booker L, Burston JJ, et al. Nat Neurosci. 2010 Sep; 13(9):1113-9. Epub 2010 Aug 22.
- [Fatty acid amide hydrolase as a potential therapeutic target for the treatment of pain and CNS disorders.](#) [Expert Opin Drug Discov. 2009] Fatty acid amide hydrolase as a potential therapeutic target for the treatment of pain and CNS disorders.
Ahn K, Johnson DS, Cravatt BF. Expert Opin Drug Discov. 2009 Jul; 4(7):763-784.
- [Cannabinoids as novel anti-inflammatory drugs.](#) [Future Med Chem. 2009] Cannabinoids as novel anti-inflammatory drugs.
Nagarkatti P, Pandey R, Rieder SA, Hegde VL, Nagarkatti M. Future Med Chem. 2009 Oct; 1(7):1333-49.

[See all...](#)

All links from this record

- [Related Citations](#)
Calculated set of PubMed citations closely related to the selected article(s) retrieved using a word weight algorithm. Related articles are displayed in ranked order from most to least relevant, with the “linked from” citation displayed first.
- [BioSystems](#)
Pathways and biological systems (BioSystems) that cite the current articles. Citations are from the BioSystems source databases (KEGG and BioCyc).
- [Compound \(MeSH Keyword\)](#)
PubChem chemical compound records that are classified under the same Medical Subject Headings (MeSH) controlled vocabulary as the current articles.
- [Substance \(MeSH Keyword\)](#)
PubChem chemical substance (submitted) records that are classified under the same Medical Subject Headings (MeSH) controlled vocabulary as the current articles.
- [Cited in PMC](#)
Full-text articles in the PubMed Central Database that cite the current articles.

Recent activity

[Cannabinoid receptors as therapeutic targets.](#)

PubMed

[Cannabinoids: potential anticancer agents.](#)

Cannabinoids: potential anticancer agents.

Nat Rev Cancer. 2003 Oct ;3(10):745-55.

PubMed

[See more...](#)