Granny Storm Crow's List - January 2014

THE SYNTHETICS

**ABN-CBD/ ABNORMAL CANNABIDIOL/ CAY10429** - GPR-18 agonist? GPR-55 agonist?


Inhibition of human neutrophil chemotaxis by endogenous cannabinoids and phytocannabinoids: evidence for a site distinct from CB1 and CB2. (full – 2008) http://molpharm.aspetjournals.org/content/73/2/441.long


N-arachidonoylglycine, an abundant endogenous lipid, potently drives directed cellular migration through GPR18, the putative abnormal cannabidiol receptor (full – 2010) http://www.biomedcentral.com/1471-2202/11/44


siRNA knockdown of GPR18 receptors in BV-2 microglia attenuates N-arachidonoyl glycine-induced cell migration (full – 2012) http://www.jmolecularsignaling.com/content/7/1/10


Mechanism of Central Atypical Cannabinoid Receptor GPR18-Mediated Hypotension in Conscious Rats (abst – 2013)
http://www.fasebj.org/cgi/content/meeting_abstract/27/1_MeetingAbstracts/654.15?sid=eea722c0-971c-4daa-8b8c-38c0c63c19ad

Role of Central Atypical Cannabinoid Receptor GPR18 in Modulating Cardiovascular Function (abst – 2013)
http://www.fasebj.org/cgi/content/meeting_abstract/26/1_MeetingAbstracts/663.10?sid=eea722c0-971c-4daa-8b8c-38c0c63c19ad

Evaluation of the insulin releasing and antihyperglycaemic activities of GPR55 lipid agonists using clonal beta-cells, isolated pancreatic islets and mice. (abst – 2013)

Cannabinoid Effects on β Amyloid Fibril and Aggregate Formation, Neuronal and Microglial-Activated Neurotoxicity In Vitro (abst – 2013)

A GPR18-based signaling system regulates IOP in murine eye. (abst – 2013)

The Novel Endocannabinoid Receptor GPR18 isExpressed in the Rostral Ventrolateral Medulla and Exerts Tonic Restraining Influence on Blood Pressure. (full – 2014)
http://jpet.aspetjournals.org/content/early/2014/01/15/jpet.113.209213.long

**ACEA/ARACHIDONYL-2'-CHLOROETHYLAMIDE** - CB1 agonist

Synthesis and characterization of potent and selective agonists of the neuronal cannabinoid receptor (CB1) (full – 1999)
http://jpet.aspetjournals.org/content/289/3/1427.long

The cannabinoids R(-)-7-hydroxy-delta-6-tetra-hydrocannabinol-dimethylheptyl (HU-210), 2-O-arachidonoylglycerylether (HU-310) and arachidonyl-2-chloroethylamide (ACEA) increase isoflurane provoked sleep duration by activation of cannabinoids 1 (CB1)-receptors in mice. (abst – 2002) http://www.ncbi.nlm.nih.gov/pubmed/12095655

In vivo effects of CB1 receptor ligands on lipid peroxidation and antioxidant defense systems in the rat brain of healthy and ethanol-treated rats. (full – 2006)

Differential effect of cannabinoid agonists and endocannabinoids on histamine release from distinct regions of the rat brain. (full – 2006)
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1769340/?tool=pubmed

Opposing control of cannabinoid receptor stimulation on amyloid-beta-induced reactive gliosis: in vitro and in vivo evidence. (full - 2007) http://jpet.aspetjournals.org/content/322/3/1144.long


Attenuation of Experimental Autoimmune Hepatitis by Exogenous and Endogenous Cannabinoids: Involvement of Regulatory T Cells (full - 2008) http://molpharm.aspetjournals.org/content/74/1/20.full?maxtoshow=&hits=80&RESULTFORMAT=&fulltext=cannabinoid&searchid=1&FIRSTINDEX=320&resourcetype=HWCIT#content-block

Cannabinoid modulation of cutaneous Adelta nociceptors during inflammation. (full – 2008) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2585399/?tool=pubmed


Cannabinoid receptor activation induces apoptosis through tumor necrosis factor alpha-mediated ceramide de novo synthesis in colon cancer cells. (full – 2008) http://clincancerres.aacrjournals.org/content/14/23/7691.long


Endogenous cannabinoids induce fever through the activation of CB1 receptors. (full – 2009) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2765314/?tool=pubmed


Regulatory Role of Cannabinoid Receptor 1 in Stress-Induced Excitotoxicity and Neuroinflammation (full - 2010) http://www.nature.com/npp/journal/vaop/ncurrent/full/npp2010214a.html


Contrasting effects of different cannabinoid receptor ligands on mouse ingestive behavior (abst – 2012) http://www.unboundmedicine.com/medline/ebm/record/22772336/abstract/Contrasting_effects_of_differen t_cannabinoid_receptor_ligands_on_mouse_ingestive_behavior_.

Protective effect of cannabinoid CB1 receptor activation against altered intrinsic repetitive firing properties induced by Aβ neurotoxicity.  (abst – 2012)  

CB1 cannabinoid receptor activation rescues amyloid β-induced alterations in behaviour and intrinsic electrophysiological properties of rat hippocampal CA1 pyramidal neurones. (abst – 2012)  

Opposing Roles for Cannabinoid Receptor Type-1 (CB(1)) and Transient Receptor Potential Vanilloid Type-1 Channel (TRPV1) on the Modulation of Panic-Like Responses in Rats.  (abst – 2012)  

Contrasting protective effects of cannabinoids against oxidative stress and amyloid-β evoked neurotoxicity in vitro.  (abst – 2012)  

Cannabinoids and muscular pain. Effectiveness of the local administration in rat.  
(abst – 2012)  

Revisiting CB1 Receptor as Drug Target in Human Melanoma.  (abst – 2012)  

Photoperiodic Changes in Endocannabinoid Levels and Energetic Responses to Altered Signalling at CB1 Receptors in Siberian Hamsters  (abst – 2012)  

Effect of ACEA-a selective cannabinoid CB1 receptor agonist on the protective action of different antiepileptic drugs in the mouse pentylenetetrazole-induced seizure model. (abst – 2012)  

(abst – 2012)  

Distribution and function of the endocannabinoid system in the rat and human bladder.  
(abst – 2012)  

Chronic activation of cannabinoid receptors in vitro does not compromise mouse islet function.  (abst – 2012)  

Study: Cannabis Agonists Produce Anti-Cancer Effects In Human Liver Cancer Cells  
(news – 2012)  

Anti-Cancer Effects In Human Liver Cancer Cells Produced By Cannabis Agonists  
(news – 2012)  
http://www.imarijuana.com/tag/cannabinoid-agonists

Type-1 (CB(1)) Cannabinoid Receptor Promotes Neuronal Differentiation and Maturation of Neural Stem Cells.  (full – 2013)  
http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0054271


AJULEMIC ACID/ AjA/ IP-751/ HU-239/ CT-3 - analog of Δ8-THC-11-oic acid, mechanism of action not established

The Role of Cannabis and Cannabinoids in Pain Management  (full – 2002)  
http://www.humanhemphealth.ca/Russo-AAPM_chapter.pdf

Marijuana-Derived Compound Targets Pain, Inflammation  (news - 2002)  

Analgesic effect of the synthetic cannabinoid CT-3 on chronic neuropathic pain: a randomized controlled trial.  (full - 2003)  
http://jama.ama-assn.org/cgi/content/full/290/13/1757?maxtoshow=&hits=80&RESULTFORMATT=&fulltext=cannabis&searchid=1&FIRSTINDEX=0&resourcetype=HWCIT

Ajulemic acid: A novel cannabinoid produces analgesia without a “high”  (abst - 2004)  

Ajulemic acid (IP-751): Synthesis, proof of principle, toxicity studies, and clinical trials  (full - 2005)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2751505/?tool=pubmed

Marijuana-Derived Drug Suppresses Bladder Overactivity And Irritation In Animal Models  (news - 2005)  

Cannabimimetic Properties of Ajulemic Acid  (full - 2006)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2633725/?tool=pmcentrez

Marijuana-Derived Drug Suppresses Bladder Pain In Animal Models  (news - 2006)  
http://www.sciencedaily.com/releases/2006/05/060521103039.htm

Cannabimimetic Properties of Ajulemic Acid  (full - 2007)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2633725/

In humans, ajulemic acid has a more favorable side-effect profile than THC for the treatment of chronic neuropathic pain  (full - 2007)  

Letter: Preclinical assessment of abuse liability of ajulemic acid  (letter - 2007)  

Suppression of fibroblast metalloproteinases by ajulemic acid, a nonpsychoactive cannabinoid acid.  (abst - 2007)  

Effects of IP-751, ajulemic acid, on bladder overactivity induced by bladder irritation in rats.  (abst - 2007)  

Symptomatic treatment of multiple sclerosis using cannabinoids: recent advances.
Cannabinoids in the management of difficult to treat pain  (full - 2008)
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2503660/?tool=pmcentrez


Cannabinoids, Endocannabinoids, and Related Analogs in Inflammation  (full - 2009)  http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2664885/?tool=pmcentrez


**AM-111/D-JNKI-1/XG- 102** – blocks the MAPK-JNK signal pathway

A peptide inhibitor of c-Jun N-terminal kinase protects against both aminoglycoside and acoustic trauma-induced auditory hair cell death and hearing loss. (full – 2003)
http://www.jneurosci.org/content/23/24/8596.long


The JNK inhibitor XG-102 protects against TNBS-induced colitis. (full – 2012) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3302790/


Molecular mechanisms involved in cochlear implantation trauma and the protection of hearing and auditory sensory cells by inhibition of c-Jun-N-terminal kinase signaling.

**AM-251** – GPR 55 agonist, CB1 antagonist/ inverse agonist

Inhibition of Rat C6 Glioma Cell Proliferation by Endogenous and Synthetic Cannabinoids. Relative Involvement of Cannabinoid and Vanilloid Receptors (full - 2001) [http://jpet.aspetjournals.org/content/299/3/951.full](http://jpet.aspetjournals.org/content/299/3/951.full)

Influence of the CB1 receptor antagonist, AM 251, on the regional haemodynamic effects of WIN-55212-2 or HU 210 in conscious rats (full - 2002) [http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1573379/?tool=pmcentrez](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1573379/?tool=pmcentrez)

CB1 cannabinoid receptor antagonism promotes remodeling and cannabinoid treatment prevents endothelial dysfunction and hypotension in rats with myocardial infarction (full - 2003) [http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1573770/?tool=pmcentrez](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1573770/?tool=pmcentrez)


Effects of cannabinoid receptor-2 activation on accelerated gastrointestinal transit in lipopolysaccharide-treated rats (full - 2004) [http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1575196/?tool=pmcentrez](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1575196/?tool=pmcentrez)

Up-Regulation of Cyclooxygenase-2 Expression Is Involved in R(−)-Methanandamide-Induced Apoptotic Death of Human Neuroglioma Cells (full - 2004) [http://molpharm.aspetjournals.org/content/66/6/1643.full.pdf+html](http://molpharm.aspetjournals.org/content/66/6/1643.full.pdf+html)

The cannabinoid 1 receptor antagonist, AM251, prolongs the survival of rats with severe acute pancreatitis. (full - 2005) [https://www.jstage.jst.go.jp/article/tjem/207/2/207_2_99/_pdf](https://www.jstage.jst.go.jp/article/tjem/207/2/207_2_99/_pdf)

Cannabinoids augment the release of neuropeptide Y in the rat hypothalamus

Cannabinoid CB1 receptor antagonists cause status epilepticus-like activity in the hippocampal neuronal culture model of acquired epilepsy  (full - 2006)  http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1808496/?tool=pmcentrez

AM 251 produces sustained reductions in food intake and body weight that are resistant to tolerance and conditioned taste aversion  (full - 2006)  http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1615836/?tool=pmcentrez

Antinociceptive effect of cannabinoid agonist WIN 55,212–2 in rats with a spinal cord injury  (full - 2006)  http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1861843/?tool=pmcentrez


Cardiovascular effects of cannabinoids in conscious spontaneously hypertensive rats  (full - 2007)  http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2190006/?tool=pmcentrez


Cannabinoid action in the olfactory epithelium  (full - 2007)  http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1815290/?tool=pmcentrez

Ultra-low dose cannabinoid antagonist AM251 enhances cannabinoid anticonvulsant effects in the pentylentetrazole-induced seizure in mice.  (abst – 2007)
The local antinociceptive effects of paracetamol in neuropathic pain are mediated by cannabinoid receptors (abst – 2007)

Effect of Endocannabinoid System on the Neurogenic Function of Rat Corpus Cavernosum (abst – 2007)

Cannabinoids Inhibit HIV-1 Gp120-Mediated Insults in Brain Microvascular Endothelial Cells (full - 2008)
http://www.jimmunol.org/cgi/content/full/181/9/6406?maxtoshow=&hits=80&RESULTFORMAT=&fulltext=cannabinoid&searchid=1&FIRSTINDEX=160&resourcetype=HWCIT

Attenuation of Experimental Autoimmune Hepatitis by Exogenous and Endogenous Cannabinoids: Involvement of Regulatory T Cells (full - 2008)
http://molpharm.aspetjournals.org/content/74/1/20.full?maxtoshow=&hits=80&RESULTFORMAT=&fulltext=cannabinoid&searchid=1&FIRSTINDEX=320&resourcetype=HWCIT#content-block

Loss of cannabinoid receptor 1 accelerates intestinal tumor growth (full - 2008)
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2561258/?tool=pubmed

Acute hypertension reveals depressor and vasodilator effects of cannabinoids in conscious rats (full - 2008)
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2697765/?tool=pmcentrez

Activating Parabrachial Cannabinoid CB1 Receptors Selectively Stimulates Feeding of Palatable Foods in Rats (full - 2008)
http://www.jneurosci.org/cgi/content/full/28/39/9702?maxtoshow=&hits=80&RESULTFORMAT=&fulltext=cannabinoid&searchid=1&FIRSTINDEX=0&resourcetype=HWCIT

Feeding induced by cannabinoids is mediated independently of the melanocortin system. (full - 2008)
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2386290/?tool=pubmed

Acute effects of endocannabinoid anandamide and CB1 receptor antagonist, AM251 in the regulation of thyrotropin secretion. (full – 2008)
http://joe.endocrinology-journals.org/content/199/2/235.long


Effect of biliary cirrhosis on nonadrenergic noncholinergic-mediated relaxation of rat corpus cavernosum: Role of nitric oxide pathway and endocannabinoid system (abst – 2008)
http://journals.tums.ac.ir/abs.aspx?culture_var=en&journal_id=9&org_id=59&manuscript_id=6272

Effect of anandamide in improving of the non-adrenergic non-cholinergic relaxation of the corpus cavernosum from diabetic rats (abst – 2008)
Endocannabinoid and serotonergic systems are needed for acetaminophen-induced analgesia. (abst – 2008)  
http://www.ncbi.nlm.nih.gov/pubmed/18485596?dopt=Abstract&holding=f1000,f1000m,isrctn

Peripheral cannabinoid CB1 receptors inhibit evoked responses of nociceptive neurones in vivo (abst – 2008)  

Synthetic and plant-derived cannabinoid receptor antagonists show hypophagic properties in fasted and non-fasted mice (full - 2009)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2697695/?tool=pubmed

Pretreatment with electroacupuncture induces rapid tolerance to focal cerebral ischemia through regulation of endocannabinoid system. (full – 2009)  
http://stroke.ahajournals.org/content/40/6/2157.full

Endocannabinoids in the rat basolateral amygdala enhance memory consolidation and enable glucocorticoid modulation of memory (full - 2009)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2660732/?tool=pmcentrez

Modulation of motor and sensory pathways of the peristaltic reflex by cannabinoids. (full – 2009)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2739820/?tool=pubmed

The effects of intracerebroventricular AM-251, a CB1-receptor antagonist, and ACEA, a CB1-receptor agonist, on penicillin-induced epileptiform activity in rats. (full – 2009)  

Effects of the cannabinoid CB1 receptor antagonist AM 251 on the reinstatement of nicotine-conditioned place preference by drug priming in rats. (full - 2009)  

Endogenous anandamide and cannabinoid receptor-2 contribute to electroacupuncture analgesia in rats. (abst – 2009)  

Cannabinoids and neurodegenerative diseases. (abst - 2009)  

Endocannabinoids prevent lysosomal membrane destabilisation evoked by treatment with β-amyloid in cultured rat cortical neurons (forum repost/abst – 2009)  

Regulation of the Hypothalamic-Pituitary-Adrenal Axis Circadian Rhythm by Endocannabinoids Is Sexually Diergic (full - 2010)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2964781/?tool=pmcentrez
Cannabinoids excite circadian clock neurons.  (full – 2010)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2927117/?tool=pubmed

GPR55 ligands promote receptor coupling to multiple signalling pathways. (full – 2010)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2931561/?tool=pubmed

Cannabinoid receptor CB1 mediates baseline and activity-induced survival of new neurons in adult hippocampal neurogenesis  (full - 2010)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2898685/?tool=pubmed

Spinal and peripheral analgesic effects of the CB cannabinoid receptor agonist AM1241 in two models of bone cancer-induced pain.  (full - 2010)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2931557/?tool=pubmed

The Neuroprotective Effect of Cannabinoid Receptor Agonist (WIN55,212-2) in Paraoxon Induced Neurotoxicity in PC12 Cells and N-methyl-D-aspartate Receptor Interaction  (full – 2010)  

Naphthalen-1-yl-(4-pentyloxynaphthalen-1-yl)methanone (SAB378), a peripherally restricted cannabinoid CB1/CB2 receptor agonist, inhibits gastrointestinal motility but has no effect on experimental colitis in mice.  (full – 2010)  
http://jpet.aspetjournals.org/content/334/3/973.long

The Endocannabinoid System Tonically Regulates Inhibitory Transmission and Depresses the Effect of Ethanol in Central Amygdala  (full - 2010)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2904853/

Pharmacological characterization of GPR55, a putative cannabinoid receptor.  
(full – 2010)  

Anandamide and AM251, via water, modulate food intake at central and peripheral level in fish.  (abst – 2010)  

Involvement of ERK 1/2 activation in electroacupuncture pretreatment via cannabinoid CB1 receptor in rats.  (abst – 2010)  

The endocannabinoid system modulates the valence of the emotion associated to food ingestion  (abst – 2010)  

Cannabidiol (CBD) as an Anti-Arrhythmic – The Role of the CB1 Receptors  
(news – 2010)  

A Pilot Study into the Effects of the CB1 Cannabinoid Receptor Agonist WIN55,212-2 or the Antagonist/Inverse Agonist AM251 on Sleep in Rats (full – 2011) http://www.hindawi.com/journals/sd/2011/178469/


α-Tocopherol and α-tocopheryl phosphate interact with the cannabinoid system in the rodent hippocampus. (abst - 2011) http://www.ncbi.nlm.nih.gov/pubmed/21843633

Cannabidiol as an anti-arrhythmic, the role of the CB1 receptors. (abst – 2011) http://heart.bmj.com/content/97/24/e8.9.abstract


Endocannabinoid CB1 receptors modulate visual output from the thalamus. (abst – 2011) http://www.ncbi.nlm.nih.gov/pubmed/21773721


Cannabinoid Receptor Type 1 (CB1) Activation Inhibits Small GTPase RhoA Activity and Regulates Motility of Prostate Carcinoma Cells (full – 2012) http://endo.endojournals.org/content/153/1/29.full

A Role for the Cannabinoid 1 Receptor in Neuronal Differentiation of Adult Spinal Cord Progenitors in vitro is Revealed through Pharmacological Inhibition and Genetic Deletion.  (full – 2012)  http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3265030/?tool=pubmed

Cannabinoid HU210 Protects Isolated Rat Stomach against Impairment Caused by Serum of Rats with Experimental Acute Pancreatitis.  (full - 2012)  http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0052921

The cannabinoid receptor CB1 modulates the signaling properties of the lysophosphatidylinositol receptor GPR55.  (full – 2012)  http://www.jbc.org/content/early/2012/11/16/jbc.M112.364109.long

Medial prefrontal cortex endocannabinoid system modulates baroreflex activity through CB1 receptors  (full – 2012)  http://ajpregu.physiology.org/content/302/7/R876


Bidirectional regulation of endocannabinoid signaling in the amygdala contributes to activation and adaptation of the stress response  (abst – 2012)  http://www.journaldatabase.org/articles/bidirectional_regression.html


Opposing Roles for Cannabinoid Receptor Type-1 (CB(1)) and Transient Receptor Potential Vanilloid Type-1 Channel (TRPV1) on the Modulation of Panic-Like Responses in Rats.  (abst – 2012)  http://www.ncbi.nlm.nih.gov/pubmed/21937980


The interaction between intrathecal administration of low doses of palmitoylethanolamide and AM251 in formalin-induced pain related behavior and spinal cord IL1-β expression in rats. (abst – 2012) http://www.ncbi.nlm.nih.gov/pubmed/22201038


The anti-nausea effects of CB(1) agonists are mediated by an action at the visceral insular cortex. (abst – 2012) http://www.ncbi.nlm.nih.gov/pubmed/22671779


Effects of gonadal hormones on the peripheral cannabinoid receptor 1 (CB1R) system under a myositis condition in rats. (abst – 2012) http://www.ncbi.nlm.nih.gov/pubmed/22940464

Role of endocannabinoids and cannabinoid-1 receptors in cerebrocortical blood flow regulation. (full – 2013) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3537620/
Activation of Type 1 Cannabinoid Receptor (CB1R) Promotes Neurogenesis in Murine Subventricular Zone Cell Cultures (full – 2013) http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0063529


A role for O-1602 and G protein-coupled receptor GPR55 in the control of colonic motility in mice. (full – 2013) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3677091/


CB1 and CB2 Cannabinoid Receptor Agonists Induce Peripheral Antinociception by Activation of the Endogenous Noradrenergic System. (full – 2013) http://journals.lww.com/anesthesia-analgesia/Fulltext/2013/02000/0/CB1_and_CB2_Cannabinoid_Receptor_Agonists_Induce_31.aspx


Cannabinoid HU210 Protects Isolated Rat Stomach against Impairment Caused by Serum of Rats with Experimental Acute Pancreatitis (full – 2013) http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0052921


Involvement of prelimbic medial prefrontal cortex in panic-like elaborated defensive behaviour and innate fear-induced antinociception elicited by GABAA receptor blockade in the dorsomedial and ventromedial hypothalamic nuclei: role of the endocannabinoid CB1 receptor. (abst – 2013) http://www.ncbi.nlm.nih.gov/pubmed/23521775


2-AG into the lateral hypothalamus increases REM sleep and cFos expression in melanin concentrating hormone neurons in rats. (abst – 2013) http://www.ncbi.nlm.nih.gov/pubmed/23603032


Impact of omega-6 polyunsaturated fatty acid supplementation and γ-aminobutyric acid on astrogliogenesis through the endocannabinoid system. (abst – 2013) http://www.ncbi.nlm.nih.gov/pubmed/23633391


Effects of compounds that interfere with the endocannabinoid system on behaviors predictive of anxiolytic and panicolytic activity in the elevated T-maze (abst – 2013) http://www.ncbi.nlm.nih.gov/pubmed/23711591


Regulation of cell proliferation by GPR55/cannabinoid receptors using (R,R')-4'-methoxy-1-naphthylfenoterol in rat C6 glioma cell line (abst – 2013) http://www.abstractsonline.com/Plan/ViewAbstract.aspx?sKey=695437a2-7613-4bef-8697-2294df2da859&cKey=18ba6eb0-2c5f-4004-a56f-2d1f450e2ed1&mKey=9b2d28e7-24a0-466f-a3c9-07c21f6e9be9

(R,R')-4'-methoxy-1-naphthylfenoterol Inhibits GPR55 signaling and the modulation of motility in human cancer cells (abst – 2013) http://www.abstractsonline.com/Plan/ViewAbstract.aspx?sKey=25370896-7d13-4f15-be76-f664d79b577d&cKey=87b7fece1-45cc-42b7-aca7-48c6b1d42773&mKey=9b2d28e7-24a0-466f-a3c9-07c21f6e9be9


Anandamide modulates the neuroendocrine responses induced by extracellular volume expansion.  

Activation of spinal cannabinoid cb2 receptors inhibits neuropathic pain in streptozotocin-induced diabetic mice.  

Complex interaction between anandamide and the nitrergic system in the dorsolateral periaqueductal gray to modulate anxiety-like behavior in rats.  

Comparative effects of parathion and chlorpyrifos on extracellular endocannabinoid levels in rat hippocampus: Influence on cholinergic toxicity.  

Novel effects of the cannabinoid inverse agonist AM 251 on parameters related to metabolic syndrome in obese Zucker rats.  

CB1 and CB2 Cannabinoid Receptor Antagonists Prevent Minocycline-Induced Neuroprotection Following Traumatic Brain Injury in Mice.  

The endocannabinoid anandamide induces apoptosis of rat decidual cells through a mechanism involving ceramide synthesis and p38 MAPK activation.  

A role for the endocannabinoid system in exercise-induced spatial memory enhancement in mice.  

The endocannabinoid system mediates aerobic exercise-induced antinociception in rats.  

Endocannabinoids decrease neuropathic pain-related behavior in mice through the activation of one or both peripheral CB1 and CB2 receptors.  

Angiotensin II-induced activation of central AT1 receptors exerts endocannabinoid-mediated gastroprotective effect in rats.  

Cannabinoid Receptor Activation Prevents the Effects of Chronic Mild Stress on Emotional Learning and LTP in a Rat Model of Depression.  

Cytotoxicity of synthetic cannabinoids on primary neuronal cells of the forebrain: the involvement of cannabinoid CB1 receptors and apoptotic cell death.  

Impact of omega-6 polyunsaturated fatty acid supplementation and γ-aminobutyric acid on astrogliogenesis through the endocannabinoid system (abst – 2013) http://onlinelibrary.wiley.com/doi/10.1002/jnr.23231/abstract


**AM- 281** - CB1 antagonist and inverse agonist


The analgesic activity of paracetamol is prevented by the blockade of cannabinoid CB1 receptors (abst – 2005) http://www.sciencedirect.com/science/article/pii/S00142999905013178


The GPR55 ligand L-alpha-lysophosphatidylinositol promotes RhoA-dependent Ca2+ signaling and NFAT activation. (full – 2009) http://www.fasebj.org/content/23/1/183.long

GPR55 ligands promote receptor coupling to multiple signalling pathways. (full – 2010) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2931561/?tool=pubmed

Expression of cannabinoid CB1 receptors by vagal afferent neurons: kinetics and role in influencing neurochemical phenotype (full – 2010) http://ajpgi.physiology.org/content/299/1/G63.full?sid=fc6948f0-78cf-405c-981b-afaa05ee417c

Cannabinoid receptor-dependent and -independent anti-proliferative effects of omega-3 ethanolamides in androgen receptor-positive and -negative prostate cancer cell lines. (full – 2010) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2930808/?tool=pubmed

Angiotensin II induces vascular endocannabinoid release, which attenuates its vasoconstrictor effect via CB1 cannabinoid receptors. (full – 2012) http://www.jbc.org/content/early/2012/07/11/jbc.M112.346296.full.pdf+html

Early Endogenous Activation of CB1 and CB2 Receptors after Spinal Cord Injury Is a Protective Response Involved in Spontaneous Recovery (full – 2012) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3496738/

The cannabinoid receptor CB1 modulates the signaling properties of the lysophosphatidylinositol receptor GPR55. (full – 2012) http://www.jbc.org/content/early/2012/11/16/jbc.M112.364109.long


Endogenous cannabinoid receptor CB1 activation promotes vascular smooth muscle cell proliferation and neointima formation. (full – 2013) http://www.jlr.org/content/early/2013/03/11/jlr.M035147.long
Monoacylglycerol Lipase (MAGL) Inhibition Attenuates Acute Lung Injury in Mice. (full – 2013) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3808422/


GPR55 and its interaction with membrane lipids: comparison with other endocannabinoid-binding receptors. (link to PDF - 2013) http://www.eurekaselect.com/105678/article


**AM-404** – cannabinoid transport inhibitor, made in the body from acetaminophen- See ACETAMINOPHEN

Anandamide transport is independent of fatty-acid amide hydrolase activity and is blocked by the hydrolysis-resistant inhibitor AM1172. (full – 2004) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC423268/

Synergistic Interactions between Cannabinoids and Environmental Stress in the Activation of the Central Amygdala (full - 2005)  
http://www.nature.com/npp/journal/v30/n3/full/1300535a.html

Enhancing Cannabinoid Neurotransmission Augments the Extinction of Conditioned Fear (full - 2005)  
http://www.nature.com/npp/journal/v30/n3/full/1300655a.html

Conversion of acetaminophen to the bioactive N-acylphenolamine AM404 via fatty acid amide hydrolase-dependent arachidonic acid conjugation in the nervous system. (full – 2005)  
http://www.jbc.org/content/280/36/31405.long

Anxiolytic-like properties of the anandamide transport inhibitor AM404.  (full – 2006)  
http://www.nature.com/npp/journal/v31/n12/full/1301061a.html

The Endogenous Cannabinoid Anandamide Produces δ-9-Tetrahydrocannabinol-Like Discriminative and Neurochemical Effects That Are Enhanced by Inhibition of Fatty Acid Amide Hydrolase but Not by Inhibition of Anandamide Transport (full - 2007)  
http://jpet.aspetjournals.org/content/321/1/370.full

Δ9-Tetrahydrocannabinol (THC) and AM 404 protect against cerebral ischaemia in gerbils through a mechanism involving cannabinoid and opioid receptors  (full - 2007)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2189998/?tool=pmcentrez

STUDIES OF ANANDAMIDE ACCUMULATION INHIBITORS IN CEREBELLAR GRANULE NEURONS (full – 2007)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2248273/

Pharmacological enhancement of endocannabinoid signaling reduces the cholinergic toxicity of diisopropylfluorophosphate.  (full – 2008)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2659532/

Pro-drugs for indirect cannabinoids as therapeutic agents.  (abst – 2008)  

Pharmacological elevation of anandamide impairs short-term memory by altering the neurophysiology in the hippocampus.  (abst – 2011)  

The anandamide transport inhibitor AM404 reduces the rewarding effects of nicotine and nicotine-induced dopamine elevations in the nucleus accumbens shell in rats (full – 2011)  

Role of endocannabinoid and glutamatergic systems in DOI-induced head-twitch response in mice.  (abst – 2011)  

Acetaminophen differentially enhances social behavior and cortical cannabionoid levels in inbred mice.  (full – 2012)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3389197/
Endocannabinoid analogues exacerbate marble-burying behavior in mice via TRPV1 receptor.  

Effects of the anandamide uptake blocker AM404 on food intake depend on feeding status and route of administration.  

Inhibition of fatty acid amide hydrolase by URB597 attenuates the anxiolytic-like effect of acetaminophen in the mouse elevated plus-maze test.  

Peripheral antinociceptive effect of anandamide and drugs that affect the endocannabinoid system on the formalin test in normal and streptozotocin-diabetic rats.  

Involvement of the Endocannabinoid System in Ethanol-Induced Corticostriatal Synaptic Depression.  

Diuretic effects of cannabinoids.  
(full – 2013)  http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3533417/

AM404 attenuates reinstatement of nicotine seeking induced by nicotine-associated cues and nicotine priming but does not affect nicotine- and food-taking.  

Diuretic effects of cannabinoid agonists in mice.  

**AM-630** – CB2 antagonist

Cannabinoid CB2 receptor activation reduces mouse myocardial ischemia-reperfusion injury: involvement of cytokine/chemokines and PMN  

Inhibition of Inflammatory Hyperalgesia by Activation of Peripheral CB2 Cannabinoid Receptors  

Species comparison and pharmacological characterization of rat and human CB2 cannabinoid receptors.  
Antinociceptive effect of cannabinoid agonist WIN 55,212–2 in rats with a spinal cord injury (full - 2006) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1861843/?tool=pmcentrez


The local antinociceptive effects of paracetamol in neuropathic pain are mediated by cannabinoid receptors (abst – 2007) http://www.sciencedirect.com/science/article/pii/S0014299907007935

Regulation of Bone Mass, Osteoclast Function, and Ovariectomy-Induced Bone Loss by the Type 2 Cannabinoid Receptor (full - 2008) http://press.endocrine.org/doi/full/10.1210/en.2008-0150

Attenuation of Experimental Autoimmune Hepatitis by Exogenous and Endogenous Cannabinoids: Involvement of Regulatory T Cells (full - 2008) http://molpharm.aspetjournals.org/content/74/1/20.full?maxtoshow=80&RESULTFORMAT=&fulltext=cannabinoid&searchid=1&FIRSTINDEX=320&resourcetype=HWCIT#content-block

Cannabinoid CB2 Receptor Potentiates Obesity-Associated Inflammation, Insulin Resistance and Hepatic Steatosis (full - 2009) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2688760/?tool=pubmed


Cannabinoid receptor-dependent and -independent anti-proliferative effects of omega-3 ethanolamides in androgen receptor-positive and -negative prostate cancer cell lines. (full – 2010) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2930808/?tool=pubmed

Naphthalen-1-yl-(4-pentyloxynaphthalen-1-yl)methanone (SAB378), a peripherally restricted cannabinoid CB1/CB2 receptor agonist, inhibits gastrointestinal motility but has no effect on experimental colitis in mice. (full – 2010) http://jpet.aspetjournals.org/content/334/3/973.long

A nonsynonymous polymorphism in cannabinoid CB2 receptor gene is associated with eating disorders in humans and food intake is modified in mice by its ligands.
Brain cannabinoid CB2 receptors modulate cocaine's actions in mice  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3164946/

Cannabinoid receptor-2 (CB2) agonist ameliorates colitis in IL-10(-/-) mice by attenuating the activation of T cells and promoting their apoptosis.  

Cannabinoid-2 Receptor Activation Protects against Infarct and Ischemia/Reperfusion Heart Injury.  

The role of central CB2 cannabinoid receptors on food intake in neonatal chicks  

Cannabinoid receptor type 2 activation yields delayed tolerance to focal cerebral ischemia.  

Effects of a Selective Cannabinoid CB2 Agonist and Antagonist on Intravenous Nicotine Self Administration and Reinstatement of Nicotine Seeking.  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3266883/?tool=pubmed

Early Endogenous Activation of CB1 and CB2 Receptors after Spinal Cord Injury Is a Protective Response Involved in Spontaneous Recovery  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3496738/

The role of CB2 receptor ligands in human eosinophil function  

The maintenance of cisplatin- and paclitaxel-induced mechanical and cold allodynia is suppressed by cannabinoid CB2 receptor activation and independent of CXCR4 signaling in models of chemotherapy-induced peripheral neuropathy.  
http://www.molecularpain.com/content/8/1/71

Effect of omega-3 polyunsaturated fatty acids on the endocannabinoid system in osteoblast-like cells and muscle  
http://docs.lib.purdue.edu/dissertations/AAI3444794/

Cannabinoids and muscular pain. Effectiveness of the local administration in rat.  

Cannabinoids ameliorate disease progression in a model of multiple sclerosis in mice, acting preferentially through CB(1) receptor-mediated anti-inflammatory effects.  

Cannabinoid receptor 2 agonist ameliorates mesenteric angiogenesis and portosystemic collaterals in cirrhotic rats.  


Electroacupuncture reduces the expression of proinflammatory cytokines in inflamed skin tissues through activation of cannabinoid CB2 receptors. (abst – 2012)  http://www.ncbi.nlm.nih.gov/pubmed/22337285

Monoacylglycerol Lipase (MAGL) Inhibition Attenuates Acute Lung Injury in Mice. (full – 2013)  http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3808422/

CB1 and CB2 Cannabinoid Receptor Agonists Induce Peripheral Antinociception by Activation of the Endogenous Noradrenergic System. (full – 2013)  http://journals.lww.com/anesthesia-analgesia/Fulltext/2013/02000/CB1_and_CB2_Cannabinoid_Receptor_Agonists_Induce.31.aspx

Diuretic effects of cannabinoids. (full – 2013)  http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3533417/

Targeting the Endocannabinoid System to Treat Sepsis  (review – 2013)  http://www.signavitae.com/articles/review-articles/222-targeting-the-endocannabinoid-system-to-treat-sepsis


Mechanisms Of Cannabidiol Neuroprotection In Hypoxic-Ischemic Newborn Pigs: Role Of 5HT1A And CB2 Receptors. (abst – 2013)  http://www.ncbi.nlm.nih.gov/pubmed/23587650


PPARγ mediates the effects of WIN55,212-2, an synthetic cannabinoid, on the proliferation and apoptosis of the BEL-7402 hepatocarcinoma cells. (abst – 2013) http://www.ncbi.nlm.nih.gov/pubmed/24062073


Increase of mesenchymal stem cell migration by Cannabidiol via activation of p42/44 MAPK. (abst – 2013) http://www.ncbi.nlm.nih.gov/pubmed/24304686


Activation of cortical type 2 cannabinoid receptors ameliorates ischemic brain injury (news – 2013) http://www.sciencedaily.com/releases/2013/02/130221141140.htm

AM -678 - see JWH -100

AM-694 – CB1 & CB2 agonist


Acute toxicity due to the confirmed consumption of synthetic cannabinoids: clinical and laboratory findings (abst – 2012)  

Synthetic Cannabinoids - The Challenges of Testing for Designer Drugs  
(article – 2013)  

Toxicological profiles of selected synthetic cannabinoids showing high binding affinities to the cannabinoid receptor subtype CB1.  
(abst – 2013)  

A Case of Cannabinoid Hyperemesis Syndrome Caused by Synthetic Cannabinoids.  
(abst – 2013)  

Simultaneous quantification of 20 synthetic cannabinoids and 21 metabolites, and semi-quantification of 12 alkyl hydroxy metabolites in human urine by liquid chromatography-tandem mass spectrometry.  
(abst – 2013)  

AM-1172 - anandamide transport inhibitor

Anandamide transport is independent of fatty-acid amide hydrolase activity and is blocked by the hydrolysis-resistant inhibitor AM1172.  
(full – 2004)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC423268/

New molecule may be basis for drugs that battle overeating and drug dependency  
(news – 2004)  

Easing anxiety with anandamide  
(news – 2004)  

Anandamide Compound Targets Brain's 'Bliss' System  
(news – 2005)  
http://alcoholism.about.com/od/cure/a/blnida050112.htm

STUDIES OF ANANDAMIDE ACCUMULATION INHIBITORS IN CEREBELLAR GRANULE NEURONS  
(full – 2007)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2248273/
**AM-1220** – potent CB1 agonist, weak CB2 agonist

Hair analysis as a tool to evaluate the prevalence of synthetic cannabinoids in different populations of drug consumers. (abst – 2013)

**AM-1241** - CB2 agonist

Activation of CB2 cannabinoid receptors by AM1241 inhibits experimental neuropathic pain: Pain inhibition by receptors not present in the CNS (full - 2003)
http://www.pnas.org/content/100/18/10529.full

Inhibition of Inflammatory Hyperalgesia by Activation of Peripheral CB2 Cannabinoid Receptors (full – 2003)


CB2 cannabinoid receptor activation produces antinociception by stimulating peripheral release of endogenous opioids (full - 2005) http://www.pnas.org/content/102/8/3093.full


In vitro pharmacological characterization of AM1241: a protean agonist at the cannabinoid CB2 receptor? (full - 2006) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2013801/?tool=pubmed


The CB2 cannabinoid agonist AM-1241 prolongs survival in a transgenic mouse model of amyotrophic lateral sclerosis when initiated at symptom onset (full - 2007) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2819701/?tool=pmcentrez

Peripheral Cannabinoids Attenuate Carcinoma Induced Nociception in Mice (full - 2008) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2771220/

Selective Activation of Cannabinoid CB2 Receptors Suppresses Neuropathic Nociception Induced by Treatment with the Chemotherapeutic Agent Paclitaxel in Rats (full - 2008)
The endocannabinoid system in amyotrophic lateral sclerosis.  (abst - 2008)

Activation of the cannabinoid 2 receptor (CB2) protects against experimental colitis.  (full - 2009)

Spinal and peripheral analgesic effects of the CB cannabinoid receptor agonist AM1241 in two models of bone cancer-induced pain.  (full - 2010)
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2931557/?tool=pubmed

A cannabinoid 2 receptor agonist attenuates bone cancer-induced pain and bone loss.  (abst - 2010)

Cannabinoids attenuate cancer pain and proliferation in a mouse model.  (full - 2011)
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3099480/?tool=pubmed

Self-medication of a cannabinoid CB(2) agonist in an animal model of neuropathic pain.  (full – 2011)

Regulation of hematopoietic stem cell trafficking and mobilization by the endocannabinoid system.  (abst – 2011)

Cannabinoid receptor 2 and its agonists mediate hematopoiesis and hematopoietic stem and progenitor cell mobilization.  (abst – 2011)

Antinociceptive effects induced through the stimulation of spinal cannabinoid type 2 receptors in chronically inflamed mice  (abst - 2011)
http://www.unboundmedicine.com/medline/ebm/record/21771590/abstract/Antinociceptive_effects_induced_through_the_stimulation_of_spinal_cannabinoid_type_2_receptors_in_chronically_inflamed_mice

Effects of a Selective Cannabinoid CB2 Agonist and Antagonist on Intravenous Nicotine Self Administration and Reinstatement of Nicotine Seeking.  (full – 2012)
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3266883/?tool=pubmed

Prevention of Fibrosis Progression in CCl4-Treated Rats: Role of the Hepatic Endocannabinoid and Apelin Systems  (full – 2012)
http://jpet.aspetjournals.org/content/340/3/629.full

Therapeutic modulation of cannabinoid lipid signaling: Metabolic profiling of a novel antinociceptive cannabinoid-2 receptor agonist.  (abst – 2012)

Electroacupuncture reduces the expression of proinflammatory cytokines in inflamed skin tissues through activation of cannabinoid CB2 receptors.  (abst – 2012)
Diuretic effects of cannabinoids. (full – 2013)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3533417/

Cannabinoid Receptors as Therapeutic Targets for Dialysis-Induced Peritoneal Fibrosis. (abst – 2013)  

Pharmacology of Cannabinoid Receptor Agonists and a Cyclooxygenase-2 Inhibitor in Rat Bone Tumor Pain. (abst – 2013)  

CB2 cannabinoid agonist enhanced neurogenesis in GFAP/Gp120 transgenic mice displaying deficits in neurogenesis. (abst – 2013)  

Diuretic effects of cannabinoid agonists in mice. (abst – 2013)  

Effects of cannabinoid receptor type 2 on endogenous myocardial regeneration by activating cardiac progenitor cells in mouse infarcted heart. (link to PDF – 2014)  

**AM-1346** - CB1 agonist

Synthetic Cannabinoid May Aid Fertility In Smokers (news - 2006)  
http://www.medicalnewstoday.com/articles/58063.php

Marijuana-like Chemical Can Restore Sperm Function Lost to Tobacco Abuse (news - 2006)  
http://www.rxpgnews.com/specialtopics/article_5093.shtml

Cannabis-based boost for smokers’ suffering sperm (news - 2006) (may need registration)  

Effects of AM1346, a high-affinity CB1 receptor selective anandamide analog, on open-field behavior in rats. (abst – 2007)  

Discriminative stimulus functions in rats of AM1346, a high-affinity CB1R selective anandamide analog. (full – 2008)  
http://www.springerlink.com/content/n278340k6q47141k/fulltext.html

Scientist Discovers New Molecule to Treat Chronic Pain (news - 2008)  
**AM-1710** – CB2 agonist


Pharmacological characterization of AM1710, a putative cannabinoid CB(2) agonist from the cannabilactone class: Antinociception without central nervous system side-effects.  (full – 2011)  http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3089437/pdf/nihms280008.pdf

The maintenance of cisplatin- and paclitaxel-induced mechanical and cold allodynia is suppressed by cannabinoid CB2 receptor activation and independent of CXCR4 signaling in models of chemotherapy-induced peripheral neuropathy  (full – 2012)  http://www.molecularpain.com/content/8/1/71

Intrathecal cannabilactone CB(2)R agonist, AM1710, controls pathological pain and restores basal cytokine levels.  (full – 2012)  http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3603341/

**AM-2201** – CB1 agonist


Identification and Structural Elucidation of Four Cannabinimimetic Compounds (RCS-4, AM-2201, JWH-203 and JWH-210) in Seized Products (abst – 2013) http://jat.oxfordjournals.org/content/37/2/56.abstract?sid=7be65428-0ff8-4917-884b-c35f5a2819af


Analysis of AM-2201 and metabolites in a drugs and driving case (abst – 2013)  

Cytotoxicity of synthetic cannabinoids on primary neuronal cells of the forebrain: the involvement of cannabinoid CB1 receptors and apoptotic cell death (abst – 2013)  


Identification and quantification of synthetic cannabinoids in 'spice-like' herbal mixtures: A snapshot of the German situation in the autumn of 2012. (full – 2014)  

LC-QTOF-MS as a superior strategy to immunoassay for the comprehensive analysis of synthetic cannabinoids in urine. (abst – 2014)  

Driving under the influence of synthetic cannabinoids ("Spice"): a case series. (abst – 2014)  

Analysis of new classes of recreational drugs in sewage: Synthetic cannabinoids and amphetamine-like substances. (abst – 2014)  

AM-2233 — CB1 agonist

F200A substitution in the third transmembrane helix of human cannabinoid CB1 receptor converts AM2233 from receptor agonist to inverse agonist. (abst – 2006)  


Another nail in coffin of synthetic cannabis (news – 2011)  

Characteristics of the designer drug and synthetic cannabinoid receptor agonist AM-2201 regarding its chemistry and metabolism. (abst – 2013)  
**AM-3506**  – blocks the break-down of Anandamide

Inhibitor of fatty acid amide hydrolase normalizes cardiovascular function in hypertension without adverse metabolic effects.  (full – 2010)
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3003779/

Sulfonyl fluoride inhibitors of Fatty Acid amide hydrolase.  (abst – 2012)

Convergent translational evidence of a role for anandamide in amygdala-mediated fear extinction, threat processing and stress-reactivity  (abst – 2012)

Acute reduction of anandamide-hydrolase (FAAH) activity is coupled with a reduction of nociceptive pathways facilitation in medication-overuse headache subjects after withdrawal treatment.  (abst – 2012)


Role of endogenous cannabinoid system in the gut.  (full - 2013)

**AM-4054**  – CB1 agonist

Behavioral Profile of the Novel Cannabinoid Agonist AM4054  (thesis - 2006)
http://digitalcommons.uconn.edu/cgi/viewcontent.cgi?article=1016&context=srhonors_theses&sei-redir=1#search=%22am-4054%20%2Bcannabinoid%22

Effects of a Selective Cannabinoid Agonist and Antagonist on Body Temperature in Rats  (abst - 2007)
http://www.fasebj.org/cgi/content/meeting_abstract/21/5/A409?maxtoshow=&hits=80&RESULTFORMA=T=&fulltext=cannabinoid&searchid=1&FIRSTINDEX=800&resourcetype=HWCIT

Diuretic effects of cannabinoids.  (full – 2013)
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3533417/


Effects of anandamide and other CB1 ligands on cognitive function  (abst – 2013)
http://www.fasebj.org/cgi/content/meeting_abstract/27/1_MeetingAbstracts/1097.107?sid=eea722c0-971c-4d9a-8b8c-38c063c19ad
Diuretic effects of cannabinoid agonists in mice. (abst – 2013) 

Effects of a novel CB1 agonist on visual attention in male rats: Role of strategy and expectancy in task accuracy. (abst – 2013) 

**AM-4113** – CB1 antagonist

Effects of a Selective Cannabinoid Agonist and Antagonist on Body Temperature in Rats (abst - 2007) 
http://www.fasebj.org/cgi/content/meeting_abstract/21/5/A409?maxtoshow=&hits=80&RESULTFORMA T=&fulltext=cannabinoid&searchid=1&FIRSTINDEX=800&resourcetype=HWCIT

The neutral cannabinoid CB₁ receptor antagonist AM4113 regulates body weight through changes in energy intake in the rat. (abst – 2011) 


**AM-6545** – peripherally restricted CB1 antagonist, no “high”

Rehashing endocannabinoid antagonists: can we selectively target the periphery to safely treat obesity and type 2 diabetes? (full – 2010) 

A novel peripherally restricted cannabinoid receptor antagonist, AM6545, reduces food intake and body weight, but does not cause malaise, in rodents (full – 2010) 
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2990160/

The novel cannabinoid CB1 antagonist AM6545 suppresses food intake and food-reinforced behavior. (full – 2010) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3522179/

Peripheral CB1 cannabinoid receptor blockade improves cardiometabolic risk in mouse models of obesity. (full – 2010) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2912197/

Peripherally restricted CB1 receptor blockers. (abst – 2013) 
**AM- 6546 – CB1 antagonist**

Endocannabinoid signaling in the gut mediates preference for dietary unsaturated fats.
(abst – 2013)  

**AM- 6701 – equally blocks the break-down of 2-AG and anandamide**

Equipotent Inhibition of Fatty Acid Amide Hydrolase and Monoacylglycerol Lipase - Dual Targets of the Endocannabinoid System to Protect against Seizure Pathology.
(abst – 2012)  

**AM- 6702 - strongly blocks the break-down of anandamide, and, weakly, 2-AG**

Equipotent Inhibition of Fatty Acid Amide Hydrolase and Monoacylglycerol Lipase - Dual Targets of the Endocannabinoid System to Protect against Seizure Pathology.
(abst – 2012)  

**AS- 1535907 - GPR119 agonist**

The role of small molecule GPR119 agonist, AS1535907, in glucose-stimulated insulin secretion and pancreatic β-cell function  
(abst – 2010)  

Novel GPR119 agonist AS1535907 contributes to first-phase insulin secretion in rat perfused pancreas and diabetic db/db mice.  
(abst – 2010)  

**AS- 1907417 - GPR119 agonist**

AS1907417, a novel GPR119 agonist, as an insulinotropic and β-cell preservative agent for the treatment of type 2 diabetes.  
(abst – 2010)  
CANNABINOR - CB2 agonist

Pharmos Initiates Phase I Trial of CB2-Selective Drug Candidate Cannabinor

Cannabinoid Receptor Agonist Significantly Reduces Post-Operative Pain, Study Says


Cannabinor, a selective cannabinoid-2 receptor agonist, improves bladder emptying in rats with partial urethral obstruction.  (full – 2010)  http://www.jurology.com/article/S0022-5347(10)04713-0/fulltext


3 CARBOXAMIDO-5-ARYL-ISOXAZOLES – CB 2 agonists


CB – 65 - CB 2 agonist

The role of central CB2 cannabinoid receptors on food intake in neonatal chicks  (abst – 2011)  http://www.ncbi.nlm.nih.gov/pubmed/21927979


Study: Cannabis Agonists Produce Anti-Cancer Effects In Human Liver Cancer Cells  (news – 2012)


CESAMET – see NABILONE

**COMPONENT A** - CB1/2 agonist that is excluded from the brain


**CP 47,497** - CB1 & CB2 agonist

Cannabimimetic activity from CP-47,497, a derivative of 3-phenylcyclohexanol (abst - 1982)  
http://jpet.aspetjournals.org/content/223/2/516.abstract?maxtoshow=&hits=80&RESULTFORMAT=&fulltext=Hexahydrocannabinol&searchid=1&FIRSTINDEX=0&resourcetype=HWCIT

The Conformational Properties of the Highly Selective Cannabinoid Receptor Ligand CP-55,940 (full - 1996)  
http://www.ibc.org/content/271/18/10640.full?maxtoshow=&hits=80&RESULTFORMAT=&fulltext=Hexahydrocannabinol&searchid=1&FIRSTINDEX=0&resourcetype=HWCIT


Withdrawal Phenomena and Dependence Syndrome After the Consumption of "Spice Gold" (full - 2009)  http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2719097/?tool=pmcentrez

Spice drugs: cannabinoids as a new designer drugs. (abst - 2009)  http://www.unboundmedicine.com/medline/ebm/record/19718488/abstract/%5BSpice_drugs:_cannabinoids_as_a_new_designer_drugs_%5D

Pharmacological properties and dependence liabilities of synthetic cannabinoids (abst – 2010)  
http://www.unboundmedicine.com/medline/ebm/record/20681249/abstract/%5BPharmacological_properties_and_dependence_liabilities_of_synthetic_cannabinoids%5D


College students and use of K2: an emerging drug of abuse in young persons (full – 2011)  http://www.substanceabusepolicy.com/content/6/1/16

Marijuana-based Drugs: Innovative Therapeutics or Designer Drugs of Abuse? (full – 2011)  http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3139381/?tool=pubmed


CP47,497-C8 and JWH073, commonly found in 'Spice' herbal blends, are potent and efficacious CB(1) cannabinoid receptor agonists. (abst – 2011)  http://www.ncbi.nlm.nih.gov/pubmed/21333643


Use of high-resolution accurate mass spectrometry to detect reported and previously unreported cannabinomimetics in "herbal high" products. (abst – 2011)  http://www.ncbi.nlm.nih.gov/pubmed/20529459
Effects of synthetic cannabinoids on electroencephalogram power spectra in rats.  
(abst – 2011)  
http://www.unboundmedicine.com/medline/ebm/record/21640532/abstract/Effects_of_synthetic_cannabinoids_on_electroencephalogram_power_spectra_in_rats

The emergence and analysis of synthetic cannabinoids.  
(abst – 2011)  

Chemicals Used in "Spice" and "K2" Type Products Now Under Federal Control and Regulation  
(news – 2011)  
http://www.justice.gov/dea/pubs/pressrel/pr030111.html

Outlawing ‘Legal Highs’: Can Emergency Bans Hinder Drug Development?  
(news – 2011)  

Characterization of In Vitro Metabolites of CP 47,497, a Synthetic Cannabinoid, in Human Liver Microsomes by LC-MS/MS.  
(abst – 2012)  

Detection and quantification of new designer drugs in human blood: part 1 - synthetic cannabinoids.  
(abst – 2012)  

The spice in France: mixed herbs containing synthetic cannabinoids.  
(abst – 2012)  

Acute toxicity due to the confirmed consumption of synthetic cannabinoids: Clinical and laboratory findings.  
(abst – 2012)  

“Spiceophrenia”: a systematic overview of “Spice”-related psychopathological issues and a case report  
(full – 2013)  

Getting up to speed with the public health and regulatory challenges posed by new psychoactive substances in the information age  
(editorial – 2013)  

Synthetic Cannabinoids -The Challenges of Testing for Designer Drugs  
(article – 2013)  

The K2/Spice Phenomenon: emergence, identification, legislation and metabolic characterization of synthetic cannabinoids in herbal incense products.  
(abst – 2013)  

Cytotoxicity of synthetic cannabinoids on primary neuronal cells of the forebrain: the involvement of cannabinoid CB1 receptors and apoptotic cell death.  
(abst – 2013)

**CP 50,556-1 / LEVONANTRADOL** - CB1 & CB2 agonist

Clinical experience with levonantradol hydrochloride in the prevention of cancer chemotherapy-induced nausea and vomiting.  (abst – 1981)  

Randomised Clinical Trial of Levonantradol and Chlorpromazine in the Prevention of Radiotherapy-induced Vomiting.  (abst - 1982)

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**CRA–13** - CB1 & CB2 agonist

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Cannabinoid Receptor Agonist 13, a Novel Cannabinoid Agonist: First in Human Pharmacokinetics and Safety (full – 2009)  
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**CT–3** – see AJULMIC ACID

**DH-CBD / DEHYDROXYLCANNABIDIOL** - a nonpsychoactive cannabinoid

Presynaptic glycine receptors as a potential therapeutic target for hyperekplexia disease. (abst – 2014)  

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HEXAHYDROCANNABINOLS - cannabinoid derivatives

Hexahydrocannabinols, novel synthetic cannabinoid derivatives, suppress the tumor growth by inhibiting the VEGF secretion and angiogenesis  
http://www.fasebj.org/cgi/content/meeting_abstract/23/1_MeetingAbstracts/761.3?maxtoshow=&hits=10&RESULTFORMAT=&fulltext=cannabinoid&andorexactfulltext=and&searchid=1&FIRSTINDEX=0&sortsource=relevance&resourcetype=HWCIT  
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Involvement of NSAID-activated gene-1 in a novel synthetic hexahydrocannabinol analogue-induced growth inhibition and apoptosis of colon cancer cells  
http://www.fasebj.org/cgi/content/meeting_abstract/24/1_MeetingAbstracts/965.8?maxtoshow=&hits=80&RESULTFORMAT=&fulltext=Hexahydrocannabinol&searchid=1&FIRSTINDEX=0&resourcetype=HWCIT  
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Induction of p53-independent apoptosis by a novel synthetic hexahydrocannabinol analog is mediated via Sp1-dependent NSAID-activated gene-1 in colon cancer cells  
http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6T4P-4YM7FF0-2&_user=10&_coverDate=07%2F01%2F2010&_rdoc=1&_fmt=high&_orig=search&_sort=d&_docanchor=&view=c&searchStrId=13166821607_reunOrigins=scholar.google&_accnt=C0000502216&version=1&_urlVersion=0&_userid=10&md5=6f222e39268f6e27444674d5217dceeb  
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Anti-tumor activity of the novel hexahydrocannabinol analog LYR-8 in Human colorectal tumor xenograft is mediated through the inhibition of Akt and hypoxia-inducible factor-1α activation. (full – 2012)  
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**HU-210** - CB 1 & CB 2 agonist, over 100 times stronger than THC

Learning impairment produced in rats by the cannabinoid agonist HU 210 in a water-maze task. (abst – 1999)  

Suppression of Nerve Growth Factor Trk Receptors and Prolactin Receptors by Endocannabinoids Leads to Inhibition of Human Breast and Prostate Cancer Cell Proliferation (full - 2000)  

Effects of cannabinoid receptor agonists on neuronally-evoked contractions of urinary bladder tissues isolated from rat, mouse, pig, dog, monkey and human (full - 2000)  
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Involvement of central and peripheral cannabinoid receptors in the regulation of heart resistance to arrhythmogenic effects of epinephrine. (abst - 2000)  

Inhibitory effects of the cannabinoid agonist HU 210 on rat sexual behaviour. (abst – 2000)  

Targeting CB2 cannabinoid receptors as a novel therapy to treat malignant lymphoblastic disease (full - 2002)  
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Influence of the CB1 receptor antagonist, AM 251, on the regional haemodynamic effects of WIN-55212-2 or HU 210 in conscious rats (full - 2002)  
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The cannabinoids R(-)-7-hydroxy-delta-6-tetra-hydrocannabinol-dimethylheptyl (HU-210), 2-O-arachidonylgllycerylether (HU-310) and arachidonyl-2-chloroethylamide (ACEA) increase isoflurane provoked sleep duration by activation of cannabinoids 1 (CB1)-receptors in mice. (abst – 2002)  

Inhibition of tumor angiogenesis by cannabinoids (full - 2003)  
http://www.fasebj.org/cgi/reprint/02-0795fjev1?maxtoshow=&hits=10&RESULTFORMAT=&fulltext=cannabis&andorexactfulltext=and&searchid=1&FIRSTINDEX=20&sortspec=relevance&resourcetype=HWCIT

CB1 cannabinoid receptor antagonism promotes remodeling and cannabinoid treatment prevents endothelial dysfunction and hypotension in rats with myocardial infarction (full - 2003)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1573770/?tool=pmcentrez

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Histamine induced responses are attenuated by a cannabinoid receptor agonist in human skin. (abst – 2003)  

The endogenous cannabinoid system protects against colonic inflammation (full - 2004)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC385396/?tool=pmcentrez

Cannabinoids spell relief in colon inflammation (news – 2004)  

Cannabinoids promote embryonic and adult hippocampus neurogenesis and produce anxiolytic- and antidepressant-like effects (full - 2005)  
http://www.jci.org/articles/view/25509/version/1

Direct cerebrovascular effects of CB1 receptor activation by the synthetic endocannabinoid HU-210 in vivo (abst - 2005)  
http://www.nature.com/jcbfm/journal/v25/n1s/full/9591524.0581a.html

Cannabinoids provide neuroprotection against 6-hydroxydopamine toxicity in vivo and in vitro: relevance to Parkinson's disease. (abst - 2005)  

The analgesic activity of paracetamol is prevented by the blockade of cannabinoid CB1 receptors (abst – 2005)  

Is cannabis good for your brain? (news - 2005)  
Study Shows Marijuana Promotes Neuron Growth (news - 2005)  
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Marijuana May Grow Neurons in the Brain (news - 2005)  
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Actions of the FAAH inhibitor URB597 in neuropathic and inflammatory chronic pain models (full - 2006)  
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Cannabinoids Ameliorate Pain and Reduce Disease Pathology in Cerulein-Induced Acute Pancreatitis (full - 2007)  

Increased endocannabinoid levels reduce the development of precancerous lesions in the mouse colon (full - 2007)  
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Cannabinoids Induce Glioma Stem-like Cell Differentiation and Inhibit Gliomagenesis (full - 2007)  
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The synthetic cannabinoid HU210 induces spatial memory deficits and suppresses hippocampal firing rate in rats (full – 2007)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2013991/

The synthetic cannabinoid HU-210 attenuates neural damage in diabetic mice and hyperglycemic pheochromocytoma PC12 cells (abst - 2007)  

The synthetic cannabinoids attenuate allodynia and hyperalgesia in a rat model of trigeminal neuropathic pain. (abst – 2007)  

Excitotoxicity in a chronic model of multiple sclerosis: Neuroprotective effects of cannabinoids through CB1 and CB2 receptor activation. (abst – 2007)  

Cannabinoid receptor agonists are mitochondrial inhibitors: a unified hypothesis of how cannabinoids modulate mitochondrial function and induce cell death. (abst – 2007)  
Repeated Cannabinoid Injections into the Rat Periaqueductal Gray Enhances Subsequent Morphine Antinociception  (full - 2008)  http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2743428/?tool=pmcentrez

Cannabinoid receptor 1 is a potential drug target for treatment of translocation-positive rhabdomyosarcoma  (full - 2009)  http://mct.aacrjournals.org/content/8/7/1838.full


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The anti-nausea effects of CB(1) agonists are mediated by an action at the visceral insular cortex. (abst – 2012) [http://www.ncbi.nlm.nih.gov/pubmed/22671779]


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HU-211 / DEXANABINOL/ DEXANABINONE/ SINNABIDOL/ ETS-2101/ PA 50211/ PRS 211007 - CB 2 agonist

HU-211, a Novel Noncompetitive N-Methyl-D-Aspartate Antagonist, Improves Neurological Deficit and Reduces Infarct Volume After Reversible Focal Cerebral Ischemia in the Rat  (full - 1995)  http://stroke.ahajournals.org/cgi/content/full/26/12/2313


Protection Against Septic Shock and Suppression of Tumor Necrosis Factor α and Nitric Oxide Production by Dexanabinol (HU-211), a Nonpsychotropic Cannabinoid  (full - 1997)  http://jpet.aspetjournals.org/content/283/2/918.full

Cytokine production in the brain following closed head injury: dexanabinol (HU-211) is a novel TNF-alpha inhibitor and an effective neuroprotectant.  (abst – 1997)  http://www.ncbi.nlm.nih.gov/pubmed/9042110


Dexanabinol: dexanabinone, HU 211, PA 50211, PRS 211007, sinnabidol.

Latest Studies Imply That Cannabinoids Are Protective Against Alcohol-Induced Brain Damage (news – 2011) http://networkedblogs.com/mFuuX


HU-308 - CB2 agonist

HU-308: a specific agonist for CB(2), a peripheral cannabinoid receptor. (full - 1999) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC24419/?tool=pubmed

Non-psychoactive CB2 cannabinoid agonists stimulate neural progenitor proliferation (full - 2005) http://www.fasebj.org/cgi/content/full/20/13/2405?maxtoshow=&hits=10&RESULTFORMAT=&fulltext=cannabis&andorexactfulltext=and&searchid=1&FIRSTINDEX=0&sortspec=relevance&resourcetype=HW

Peripheral cannabinoid receptor, CB2, regulates bone mass (full - 2005) http://www.pnas.org/content/103/3/696.full


Non-psychoactive CB2 cannabinoid agonists stimulate neural progenitor proliferation
Activation of CB2 receptor attenuates bone loss in osteoporosis (news - 2006)  

Cannabinoid-2 receptor agonist HU-308 protects against hepatic ischemia/reperfusion injury by attenuating oxidative stress, inflammatory response, and apoptosis (full - 2007)  
http://www.jleukbio.org/cgi/content/full/82/6/1382

Endocannabinoids, cannabinoid receptors and inflammatory stress: an interview with Dr. Pál Pacher  (interview - 2007)  
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Regulation of Bone Mass, Osteoclast Function, and Ovariectomy-Induced Bone Loss by the Type 2 Cannabinoid Receptor  (full - 2008)  

Gadolinium-HU-308-incorporated micelles.  (full – 2011)  

Is lipid signaling through cannabinoid 2 receptors part of a protective system?  (full – 2011)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3062638/

The Type 2 Cannabinoid Receptor Regulates Bone Mass and Ovariectomy-Induced Bone Loss by Affecting Osteoblast Differentiation and Bone Formation  (full – 2011)  

CB2 Cannabinoid Receptors Promote Neural Progenitor Cell Proliferation via mTORC1 Signaling  (full – 2011)  
http://www.jbc.org/content/287/2/1198.full

Cannabinoid-2 Receptor Activation Protects against Infarct and Ischemia/Reperfusion Heart Injury.  (abst – 2011)  

Cannabinoid receptor 2 activation reduces intestinal leukocyte recruitment and systemic inflammatory mediator release in acute experimental sepsis  (full – 2012)  
http://ccforum.com/content/16/2/R47

Cannabinoids ameliorate disease progression in a model of multiple sclerosis in mice, acting preferentially through CB(1) receptor-mediated anti-inflammatory effects. (abst - 2012)  

Effect of omega-3 polyunsaturated fatty acids on the endocannabinoid system in osteoblast-like cells and muscle  (abst – 2012)  
http://docs.lib.purdue.edu/dissertations/AAI3444794/

Characterization of bladder function in a cannabinoid receptor type 2 knockout mouse in vivo and in vitro.  (abst – 2013)  
Prospects for cannabinoid therapies in viral encephalitis.  (abst – 2013)  

Expression of cannabinoid receptor 2 and its inhibitory effects on synovial fibroblasts in rheumatoid arthritis.  (abst – 2014)  

HU-310  – CB 1 agonist

The cannabinoids R(-)-7-hydroxy-delta-6-tetra-hydrocannabinol-dimethylheptyl (HU-210), 2-O-arachidonoylglycerylether (HU-310) and arachidonyl-2-chloroethylamide (ACEA) increase isoflurane provoked sleep duration by activation of cannabinoids 1 (CB1)-receptors in mice.  (abst – 2002)  

HU-320  – chemically related to CBD, mechanism of action not established

A novel synthetic, nonpsychoactive cannabinoid acid (HU-320) with antiinflammatory properties in murine collagen-induced arthritis.  (full - 2004)  

HU-320 identified as a novel synthetic cannabinoid with therapeutic activity in an experiment model of rheumatoid arthritis  (news – 2004)  

HU-239- see Ajulemic Acid

HU-331  – derived from cannabidiol (CBD), mechanism of action not established

A cannabinoid quinone inhibits angiogenesis by targeting vascular endothelial cells.  (full - 2006)  
http://molpharm.aspetjournals.org/content/70/1/51.long

A Cannabinoid Anticancer Quinone, HU-331, Is More Potent and Less Cardiotoxic Than Doxorubicin: A Comparative in Vivo Study  (full - 2007)  
http://jpet.aspetjournals.org/content/322/2/646.full
HU-331, a novel cannabinoid-based anticancer topoisomerase II inhibitor  (full - 2007)  
http://mct.aacrjournals.org/content/6/1/173.long

HU-331: a cannabinoid quinone, with uncommon cytotoxic properties and low toxicity.  
(abst - 2007)  

Antitumorigenic Effects of Cannabinoids beyond Apoptosis  (full - 2010)  
http://jpet.aspetjournals.org/content/332/2/336.full?sid=af53ea87-ab4b-426e-9c7e-8f750e9c4a17

**HU-910** – CB2 agonist

A new cannabinoid 2 receptor agonist HU-910 attenuates oxidative stress, inflammation, and cell death associated with hepatic ischemia/reperfusion injury.  
(abst – 2011)  

**JD5037** - CB1 agonist with limited brain penetration

New Drug Could Help Maintain Long-Term Weight Loss  (news – 2012)  
http://www.sciencedaily.com/releases/2012/07/120726122116.htm

Peripherally restricted CB1 receptor blockers.  
(abst – 2013)  

**JWH-015** – CB2 & GPR-55 agonist, mildly activates CB1 receptors

Effects of cannabinoid receptor agonists on neuronally-evoked contractions of urinary bladder tissues isolated from rat, mouse, pig, dog, monkey and human  
(full - 2000)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1571997/?tool=pmcentrez

Targeting CB2 cannabinoid receptors as a novel therapy to treat malignant lymphoblastic disease  
(full - 2002)  
http://bloodjournal.hematologylibrary.org/cgi/content/full/100/2/627?ijkey=eb71d6d7a06f311440761cfc6a7d081bce2771d

Species comparison and pharmacological characterization of rat and human CB2 cannabinoid receptors.  
(abst - 2004)  
CB2 cannabinoid receptors in trabecular meshwork cells mediate JWH015-induced enhancement of aqueous humor outflow facility. (full - 2005) http://www iovs.org/content/46/6/1988.long

Stimulation of cannabinoid receptor 2 (CB2) suppresses microglial activation (link to PDF– 2005) http://www.springerlink.com/content/tq77102q4185073/fulltext.html


Potential role for CB2 selective ligands as immunosuppressive agents (full - 2007) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1864948/?tool=pmcentrez

Opposing control of cannabinoid receptor stimulation on amyloid-beta-induced reactive gliosis: in vitro and in vivo evidence. (full - 2007) http://jpet.aspetjournals.org/content/322/3/1144.long

Spinal cannabinoid receptor type 2 activation reduces hypersensitivity and spinal cord glial activation after paw incision. (full - 2007) http://journals.lww.com/anesthesiology/Fulltext/2007/04000/Spinal_Cannabinoid_Receptor_Type_2_Activ ation.21.aspx


CB2 cannabinoid receptor agonist JWH-015 modulates human monocyte migration through defined intracellular signaling pathways. (full – 2008) http://ajpheart.physiology.org/content/294/3/H1145.long


Crosstalk between Chemokine Receptor CXCR4 and Cannabinoid Receptor CB(2) in Modulating Breast Cancer Growth and Invasion. (full – 2011) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3168464/?tool=pubmed

Marijuana-based Drugs: Innovative Therapeutics or Designer Drugs of Abuse? (full – 2011) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3139381/?tool=pubmed


Intrathecal Administration of the Cannabinoid 2 Receptor Agonist JWH015 Can Attenuate Cancer Pain and Decrease mRNA Expression of the 2B Subunit of N-Methyl-d-Aspartic Acid (full – 2011) http://journals.lww.com/anesthesia-analgesia/Fulltext/2011/08000/Intrathecal_Administration_of_the_Cannabinoid_2.33.aspx

Latest blood test detects 12 popular synthetic cannabinoids in "fake pot". (news – 2011) http://www.thefreelibrary.com/Latest+blood+test+detects+12+popular+synthetic+cannabinoids+in+%22fake...-a0261876557


The CB(2)-preferring agonist JWH015 also potently and efficaciously activates CB(1) in autaptic hippocampal neurons. (abst – 2012) http://www.ncbi.nlm.nih.gov/pubmed/22921769


Combined antiproliferative effects of the aminoalkylindole WIN55,212-2 and radiation in breast cancer cells. (full – 2013) http://jpet.aspetjournals.org/content/early/2013/11/20/jpet.113.205120.long


**JWH-018** – CB1 agonist
Withdrawal Phenomena and Dependence Syndrome After the Consumption of "Spice Gold"  (full - 2009)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2719097/?tool=pmcentrez

Spice drugs: cannabinoids as a new designer drugs.  (abst - 2009)  


Synthetic cannabis mimic found in herbal incense  (news – 2009)  

JWH018, a common constituent of 'Spice' herbal blends, is a potent and efficacious cannabinoid CB(1) receptor agonist.  (full - 2010)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2931559/?tool=pubmed

Involvement of cannabinoid-1 and cannabinoid-2 receptors in septic ileus.  (full – 2010)  

Monitoring of herbal mixtures potentially containing synthetic cannabinoids as psychoactive compounds.  (abst – 2010)  

Chemical analysis of synthetic cannabinoids as designer drugs in herbal products.  (abst – 2010)  

Pharmacological properties and dependence liabilities of synthetic cannabinoids  (abst – 2010)  
http://www.unboundmedicine.com/medline/ebm/record/20681249/abstract/%5BPharmacological_properties_and_dependence_liabilities_of_synthetic_cannabinoids%5D

Screening for the synthetic cannabinoid JWH-018 and its major metabolites in human doping controls.  (abst - 2010)  

FAQ: K2, Spice Gold, and Herbal 'Incense'  (news - 2010)  

THIS ISN'T YOUR MOTHER'S SPICE  (news - 2010)  
http://www.mapinc.org/drugnews/v10/n497/a07.html?1173

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http://www.substanceabusepolicy.com/content/6/1/16

Beyond THC: The New Generation of Cannabinoid Designer Drugs.  (full – 2011)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3187647/?tool=pubmed


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1-Pentyl-3-phenylacetylindoles and JWH-018 share in vivo cannabinoid profiles in mice. (full – 2011) [http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3139381/?tool=pubmed](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3139381/?tool=pubmed)


Latest blood test detects 12 popular synthetic cannabinoids in "fake pot". (news – 2011) [link]

'Fake Marijuana' May Trigger Heart Trouble in Teens (news – 2011) [link]

A Characterization of Synthetic Cannabinoid Exposures Reported to the National Poison Data System in 2010 (full – 2012) [link]

The role of CB2 receptor ligands in human eosinophil function (full – 2012) [link]

JWH-018 and JWH-073: Δ9-Tetrahydrocannabinol-Like Discriminative Stimulus Effects in Monkeys. (full – 2012) [link]

Adolescent Exposure of JWH-018 “Spice” Produces Subtle Effects on Learning and Memory Performance in Adulthood (full – 2012) [link]

Identification and structural characterization of the synthetic cannabinoid 3-(1-adamantoyl)-1-pentylindole as an additive in 'herbal incense'. (abst – 2012) [link]

Detection and disposition of JWH-018 and JWH-073 in mice after exposure to "Magic Gold" smoke. (abst – 2012) [link]

"Spice" and "k2" herbal highs: a case series and systematic review of the clinical effects and biopsychosocial implications of synthetic cannabinoid use in humans. (abst – 2012) [link]

Simultaneous analysis of several synthetic cannabinoids, THC, CBD and CBN, in hair by ultra-high performance liquid chromatography tandem mass spectrometry. Method validation and application to real samples. (abst – 2012) [link]

Detection and quantification of new designer drugs in human blood: part 1 - synthetic cannabinoids. (abst – 2012) [link]

A major glucuronidated metabolite of JWH-018 is a neutral antagonist at CB1 receptors. (abst – 2012) [link]

The spice in France: mixed herbs containing synthetic cannabinoids. (abst – 2012) [link]


Determination of naphthalen-1-yl-(1-pentyllindol-3-yl)methanone (JWH-018) in mouse blood and tissue after inhalation exposure to ‘buzz’ smoke by HPLC/MS/MS  (abst – 2012)  http://onlinelibrary.wiley.com/doi/10.1002/bmc.2710/abstract


Synthetic marijuana was created strictly for research at Clemson  (news – 2012)  http://www.timesnews.net/article/9042095/synthetic-marijuana-was-created-strictly-for-research-at-clemson


DIFFERENTIAL DRUG-DRUG INTERACTIONS OF THE SYNTHETIC CANNABINOIDS JWH-018 AND JWH-073: IMPLICATIONS FOR DRUG ABUSE LIABILITY AND PAIN THERAPY.  (full - 2013)  http://jpet.aspetjournals.org/content/early/2013/06/25/jpet.113.206003.long

The Directive 2010/63/EU on animal experimentation may skew the conclusions of pharmacological and behavioural studies.  (full – 2013)


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Screening for synthetic cannabinoids in hair by using LC-QTOF MS: A new and powerful approach to study the penetration of these new psychoactive substances in the population. (abst – 2013) http://www.ncbi.nlm.nih.gov/pubmed/23842479


Toxicological profiles of selected synthetic cannabinoids showing high binding affinities to the cannabinoid receptor subtype CB1. (abst – 2013) http://www.ncbi.nlm.nih.gov/pubmed/23494106


Tolerance and cross-tolerance among high-efficacy synthetic cannabinoids JWH-018 and JWH-073 and low-efficacy phytocannabinoid Δ9-THC (abst – 2013)
The omega and omega-1 monohydroxyl metabolites of the abused K2/Spice synthetic cannabinoids JWH-018 and JWH-073 bind with high affinity and act as agonists at human cannabinoid 2 receptors (hCB2s) (abst – 2013)

Conditioned taste aversion elicited by synthetic cannabinoid JWH-018 in mice is attenuated by pretreatment with phytocannabinoid {Delta}9-THC (abst – 2013)


Smart drugs: green shuttle or real drug? (abst – 2013)


Prevalence of synthetic cannabinoids in blood samples from Norwegian drivers suspected of impaired driving during a seven weeks period. (abst – 2013)
Exogenous cannabinoids as substrates, inhibitors, and inducers of human drug metabolizing enzymes: a systematic review. (abst – 2013) 

Ischemic stroke after use of the synthetic marijuana "spice" (abst – 2013) 

Cytotoxicity of synthetic cannabinoids on primary neuronal cells of the forebrain: the involvement of cannabinoid CB1 receptors and apoptotic cell death. (abst – 2013) 

Sulfaphenazole and α-Naphthoflavone Attenuate the Metabolism of the Synthetic Cannabinoids JWH-018 and AM2201 Found in K2/Spice. (abst – 2013) 

Characteristics of the designer drug and synthetic cannabinoid receptor agonist AM-2201 regarding its chemistry and metabolism (abst – 2013) 


Cannabinoids Found to Reduce 90% of Skin Cancer in Just 20 Weeks, According to New Study (news – 2013) 

LC-QTOF-MS as a superior strategy to immunoassay for the comprehensive analysis of synthetic cannabinoids in urine. (abst – 2014) 

Driving under the influence of synthetic cannabinoids ("Spice"): a case series. (abst – 2014) 

Analysis of new classes of recreational drugs in sewage: Synthetic cannabinoids and amphetamine-like substances. (abst – 2014) 

**JWH-019** – CB1 & CB2 agonist

Hair analysis as a tool to evaluate the prevalence of synthetic cannabinoids in different populations of drug consumers. (abst – 2013) 


JWH-073 - CB1 & CB2 agonist

Spice drugs: cannabinoids as a new designer drugs. (abst - 2009) http://www.unboundmedicine.com/medline/ebm/record/19718488/abstract/%5BSpice_drugs:_cannabinoids_as_a_new_designer_drugs_%5D


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Marijuana-based Drugs: Innovative Therapeutics or Designer Drugs of Abuse? (full – 2011) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3139381/?tool=pubmed


Cardiotoxicity associated with the synthetic cannabinoid, K9, with laboratory confirmation. (abst – 2011) [http://www.ncbi.nlm.nih.gov/pubmed/21802885]


CP47,497-C8 and JWH073, commonly found in 'Spice' herbal blends, are potent and efficacious CB(1) cannabinoid receptor agonists. (abst – 2011) [http://www.ncbi.nlm.nih.gov/pubmed/2133643]


Latest blood test detects 12 popular synthetic cannabinoids in "fake pot". (news – 2011) [http://www.thefreelibrary.com/Latest+blood+test+detects+12+popular+synthetic+cannabinoids+in+%22fake...-a0261876557]


Monohydroxylated metabolites of the K2 synthetic cannabinoid JWH-073 retain intermediate to high cannabinoid 1 receptor (CB1R) affinity and exhibit neutral antagonist to partial agonist activity. (abst – 2012) http://www.ncbi.nlm.nih.gov/pubmed/22266354


Synthetic marijuana was created strictly for research at Clemson (news – 2012) http://www.timesnews.net/article/9042095/synthetic-marijuana-was-created-strictly-for-research-at-clemson


Differential Drug-Drug Interactions of the Synthetic Cannabinoids JWH-018 and JWH-073: Implications for Drug Abuse Liability and Pain Therapy. (full - 2013) http://jpet.aspetjournals.org/content/early/2013/06/25/jpet.113.206003.long


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Tolerance and cross-tolerance among high-efficacy synthetic cannabinoids JWH-018 and JWH-073 and low-efficacy phytocannabinoid Δ9-THC (abst – 2013) http://www.fasebj.org/cgi/content/meeting_abstract/27/1_MeetingAbstracts/1097.1?sid=eea722c0-971c-4daa-8b8c-38c0c63c19ad

The omega and omega-1 monohydroxyl metabolites of the abused K2/Spice synthetic cannabinoids JWH-018 and JWH-073 bind with high affinity and act as agonists at human cannabinoid 2 receptors (hCB2s) (abst – 2013) http://www.fasebj.org/cgi/content/meeting_abstract/26/1_MeetingAbstracts/660.8?sid=eea722c0-971c-4daa-8b8c-38c0c63c19ad


**JWH-81** - CB1 agonist

CB1 Receptor-Mediated Signaling Underlies the Hippocampal Synaptic, Learning and Memory Deficits Following Treatment with JWH-081, a New Component of Spice/K2 Preparations. (abst – 2013) http://www.ncbi.nlm.nih.gov/pubmed/24123667


**JWH-100 / AM-678** - CB1 agonist

College students and use of K2: an emerging drug of abuse in young persons (full – 2011) http://www.substanceabusepolicy.com/content/6/1/16

JWH-122 – CB1 agonist

Analysis of 30 synthetic cannabinoids in serum by liquid chromatography-electrospray ionization tandem mass spectrometry after liquid-liquid extraction (abst – 2012)  

Acute toxicity due to the confirmed consumption of synthetic cannabinoids: Clinical and laboratory findings. (abst – 2012)  

“Spiceophrenia”: a systematic overview of “Spice”-related psychopathological issues and a case report (full – 2013)  

Qualitative Confirmation of 9 Synthetic Cannabinoids and 20 Metabolites in Human Urine Using LC-MS/MS and Library Search. (abst – 2013)  

Screening for synthetic cannabinoids in hair by using LC-QTOF MS: A new and powerful approach to study the penetration of these new psychoactive substances in the population. (abst – 2013)  

Analysis of new classes of recreational drugs in sewage: Synthetic cannabinoids and amphetamine-like substances. (abst – 2013)  

Toxicological profiles of selected synthetic cannabinoids showing high binding affinities to the cannabinoid receptor subtype CB1. (abst – 2013)  

Driving under the influence of synthetic cannabinoids ("Spice"): a case series. (abst – 2013)  

Acute Psychosis Associated with Recreational Use of Benzofuran 6-(2-Aminopropyl)Benzofuran (6-APB) and Cannabis. (abst – 2013)  
http://www.ncbi.nlm.nih.gov/pubmed/23733714

Structure-dependent inhibitory effects of synthetic cannabinoids against 12-O-tetradecanoylphorbol-13-acetate-induced inflammation and skin tumour promotion in mice (abst – 2013)  

Smart drugs: green shuttle or real drug? (abst – 2013)  

A Case of Cannabinoid Hyperemesis Syndrome Caused by Synthetic Cannabinoids. (abst – 2013)  

Blood Synthetic Cannabinoid Concentrations in Cases of Suspected Impaired Driving (abst – 2013)  

Prevalence of synthetic cannabinoids in blood samples from Norwegian drivers suspected of impaired driving during a seven weeks period. (abst – 2013)


**JWH-133/ 3-(1 1 -dimethylbutyl)- 1-deoxy- 8-THC - CB2 agonist**

Inhibition of tumor angiogenesis by cannabinoids (full - 2003) http://www.fasebj.org/cgi/reprint/02-0795jfev1?maxtoshow=&hits=10&RESULTFORMAT=&fulltext=cannabis&andorexactfulltext=and&searchid=1&FIRSTINDEX=20&sortspec=relevance&resourcetype=HWCIT

Inhibition of guinea-pig and human sensory nerve activity and the cough reflex in guinea-pigs by cannabinoid (CB2) receptor activation. (full - 2003) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1574031/?tool=pubmed

Effects of cannabinoid receptor-2 activation on accelerated gastrointestinal transit in lipopolysaccharide-treated rats (full - 2004) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1575196/?tool=pmcentrez

Non-psychoactive CB2 cannabinoid agonists stimulate neural progenitor proliferation (full - 2006) http://www.fasebj.org/cgi/content/full/20/13/2405?maxtoshow=&hits=10&RESULTFORMAT=&fulltext=cannabis&andorexactfulltext=and&searchid=1&FIRSTINDEX=0&sortspec=relevance&resourcetype=HWCIT
Agonists of cannabinoid receptor 1 and 2 inhibit experimental colitis induced by oil of mustard and by dextran sulfate sodium. (full – 2006) http://ajpgi.physiology.org/content/291/2/G364.long


Cannabinoid-2 receptor mediates protection against hepatic ischemia/reperfusion injury (full - 2007) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2228252/?tool=pmcentrez

Cannabinoids Induce Glioma Stem-like Cell Differentiation and Inhibit Gliomagenesis (full - 2007) http://www.jbc.org/content/282/9/6854.long


Attenuation of Experimental Autoimmune Hepatitis by Exogenous and Endogenous Cannabinoids: Involvement of Regulatory T Cells (full - 2008) http://molpharm.aspetjournals.org/content/74/1/20.full?maxtoshow=&hits=80&RESULTFORMAT=&fulltext=cannabinoid&searchid=1&FIRSTINDEX=320&resourcetype=HWCIT#content-block


Regression of Fibrosis after Chronic Stimulation of Cannabinoid CB2 Receptor in Cirrhotic Rats (full - 2008) http://jpet.aspetjournals.org/content/324/2/475.full?maxtoshow=&hits=80&RESULTFORMAT=&fulltext=cannabinoid&searchid=1&FIRSTINDEX=320&resourcetype=HWCIT#content-block


Cannabinoid 2 receptor induction by IL-12 and its potential as a therapeutic target for the treatment of anaplastic thyroid carcinoma. (full - 2008) http://www.nature.com/cgt/journal/v15/n2/full/7701101a.html

Cannabinoid receptor agonists inhibit growth and metastasis of breast cancer (abst - 2008)
Involvement of central cannabinoid CB2 receptor in reducing mechanical allodynia in a mouse model of neuropathic pain  (abst – 2008)


Cannabinoid CB2 Receptor Potentiates Obesity-Associated Inflammation, Insulin Resistance and Hepatic Steatosis  (full - 2009)
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2688760/?tool=pubmed

Cannabinoids as novel anti-inflammatory drugs.  (full - 2009)
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2828614/?tool=pubmed

Synthetic cannabinoid receptor agonists inhibit tumor growth and metastasis of breast cancer  (full - 2009)  http://mct.aacrjournals.org/content/8/11/3117.full


Cannabinoids reduce ErbB2-driven breast cancer progression through Akt inhibition  (full - 2010)  http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2917429/?tool=pmcentrez

Activation of cannabinoid 2 receptors protects against cerebral ischemia by inhibiting neutrophil recruitment.  (full – 2010)  http://www.fasebj.org/content/24/3/788.long

Antitumorigenic Effects of Cannabinoids beyond Apoptosis  (full - 2010)
http://jpet.aspetjournals.org/content/332/2/336.full?sid=af53ea87-ab4b-426e-9c7e-8f750e9c4a17


Cannabidiol and other cannabinoids reduce microglial activation in vitro and in vivo: relevance to Alzheimers' disease  (full – 2011)
http://molpharm.aspetjournals.org/content/early/2011/02/24/mol.111.071290.long

Is lipid signaling through cannabinoid 2 receptors part of a protective system?  (full – 2011)  http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3062638/
The activation of the cannabinoid receptor type 2 reduces neutrophilic protease-mediated vulnerability in atherosclerotic plaques (full – 2011) http://eurheartj.oxfordjournals.org/content/33/7/846.full


Brain cannabinoid CB2 receptors modulate cocaine's actions in mice (full – 2011) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3164946/


Antinociceptive effects induced through the stimulation of spinal cannabinoid type 2 receptors in chronically inflamed mice (abst - 2011) http://www.unboundmedicine.com/medline/ebm/record/21771590/abstract/Antinociceptive_effects_induced_through_the_stimulation_of_spinal_cannabinoid_type_2_receptors_in_chronically_inflamed_mice


Prolonged oral Cannabinoid Administration prevents Neuroinflammation, lowers beta-amyloid Levels and improves Cognitive Performance in Tg APP 2576 Mice. (full – 2012) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3292807/


The fatty acid amide hydrolase inhibitor URB597 exerts anti-inflammatory effects in hippocampus of aged rats and restores an age-related deficit in long-term potentiation (full – 2012) http://www.jneuroinflammation.com/content/9/1/79

Cannabinoid receptor CB2 protects against balloon-induced neointima formation. (full – 2012)  http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3774259/

Cannabinoid type 2 receptor activation downregulates stroke-induced classic and alternative brain macrophage/microglial activation concomitant to neuroprotection. (abst – 2012)  http://www.ncbi.nlm.nih.gov/pubmed/22020035


Treatment with CB 2 Agonist JWH-133 Reduces Histological Features Associated with Erectile Dysfunction in Hypercholesterolemic Mice. (full – 2013)  http://www.hindawi.com/journals/cdi/2013/263846/

Cannabinoid CB2 Receptors Regulate Central Sensitization and Pain Responses Associated with Osteoarthritis of the Knee Joint. (full – 2013)  http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0080440


The cannabinoid CB2 receptor-selective phytocannabinoid beta-caryophyllene exerts analgesic effects in mouse models of inflammatory and neuropathic pain (full – 2013)  http://www.europeanneuropsychopharmacology.com/article/S0924-977X%2813%2900302-7/fulltext


Activation of Cannabinoid Type 2 Receptor by JWH133 Protects Heart Against Ischemia/Reperfusion-Induced Apoptosis. (abst – 2013)  


Increase of mesenchymal stem cell migration by Cannabidiol via activation of p42/44 MAPK.  (abst – 2013)  http://www.ncbi.nlm.nih.gov/pubmed/24304686


**JWH – 150**  - CB2 agonist

Cannabinoid Receptor 2-Mediated Attenuation of CXCR4-Tropic HIV Infection in Primary CD4+ T Cells  (full – 2012)  
http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0033961

**JWH-200**  - CB1 agonist

Synthetic Cannabinoids - The Challenges of Testing for Designer Drugs (article – 2013) (funky link- delete the “sign in”, and it comes up)


**JWH-210** – CB1 agonist


Toxicological profiles of selected synthetic cannabinoids showing high binding affinities to the cannabinoid receptor subtype CB1. (abst – 2013)  http://www.ncbi.nlm.nih.gov/pubmed/23494106


Identification and Structural Elucidation of Four Cannabimimetic Compounds (RCS-4, AM-2201, JWH-203 and JWH-210) in Seized Products (abst – 2013)


JWH-250 – CB 1 agonist


Screening for synthetic cannabinoids in hair by using LC-QTOF MS: A new and powerful approach to study the penetration of these new psychoactive substances in the population. (abst – 2013) http://www.ncbi.nlm.nih.gov/pubmed/23842479

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LC-QTOF-MS as a superior strategy to immunoassay for the comprehensive analysis of synthetic cannabinoids in urine.  (abst – 2014)  

**JZL-184** – blocks the breakdown of 2-AG

Selective blockade of 2-arachidonoylglycerol hydrolysis produces cannabinoid behavioral effects  (full – 2009)  
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**KM-233**  –  CB2 agonist


**KML-29**  -  stops the production of MAGL, thus preventing the breakdown of 2-AG


**KN38-7271/ BAY38-7271**  –  CB1 & CB2 agonist

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Activation of cannabinoid receptor 2 attenuates leukocyte-endothelial cell interactions and blood-brain barrier dysfunction under inflammatory conditions.  (abst – 2012)  

A cannabinoid type 2 receptor agonist attenuates blood-brain barrier damage and neurodegeneration in a murine model of traumatic brain injury.  (abst – 2012)  

O-1602, an atypical cannabinoid, inhibits tumor growth in colitis-associated colon cancer through multiple mechanisms.  (abst – 2012)  

Attenuation of HIV-1 replication in macrophages by cannabinoid receptor 2 agonists.  (abst – 2013)  

Effect of cannabinoid CB2 receptor agonism on learning and memory in a mouse model of photothrombosis  (abst – 2013)  
[http://www.fasebj.org/cgi/content/meeting_abstract/27/1_MeetingAbstracts/1097.4?sid=eea722c0-971c-4daa-8b8c-38c0e63c19ad](http://www.fasebj.org/cgi/content/meeting_abstract/27/1_MeetingAbstracts/1097.4?sid=eea722c0-971c-4daa-8b8c-38c0e63c19ad)

**O-2050** - CB1 antagonist

Suppression of feeding, drinking, and locomotion by a putative cannabinoid receptor ‘silent antagonist’  (abst – 2005)  

Hypothalamic 2-arachidonoylglycerol regulates multistage process of high-fat diet preferences.  (full – 2012)  
Angiotensin II induces vascular endocannabinoid release, which attenuates its vasoconstrictor effect via CB1 cannabinoid receptors. (full – 2012) http://www.jbc.org/content/early/2012/07/11/jbc.M112.346296.full.pdf+html


OMDM-1 – blocks the reuptake of endocannabinoids


OMDM-2 – blocks the reuptake of endocannabinoids


STUDIES OF ANANDAMIDE ACCUMULATION INHIBITORS IN CEREBELLAR GRANULE NEURONS (full – 2007) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2248273/


Neuronal and glial alterations in the cerebellar cortex of maternally deprived rats: gender differences and modulatory effects of two inhibitors of endocannabinoid inactivation.


A new strategy to block tumor angiogenesis by inhibiting endocannabinoid inactivation (abst – 2013) http://www.fasebj.org/cgi/content/meeting_abstract/27/1_MeetingAbstracts/1105.6?sid=eea722c0-971c-4daa-8b8c-38c0e63c19ad

The administration of endocannabinoid uptake inhibitors OMDM-2 or VDM-11 promotes sleep and decreases extracellular levels of dopamine in rats. (abst – 2013) http://www.ncbi.nlm.nih.gov/pubmed/23238438

**ORG-27569** - enhances agonist-binding affinity to CB1


A key agonist-induced conformational change in the cannabinoid receptor CB1 is blocked by the allosteric ligand Org 27569. (abst – 2012) http://www.ncbi.nlm.nih.gov/pubmed/22846992


**PF-3845** – blocks the breakdown of anandamide

Discovery and characterization of a highly selective FAAH inhibitor that reduces inflammatory pain. (full – 2009)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2692831/

Inhibition of monoacylglycerol lipase (MAGL) attenuates NSAID-induced gastric hemorrhages in mice. (full – 2011)  
http://jpet.aspetjournals.org/content/early/2011/06/09/jpet.110.175778.long

The fatty acid amide hydrolase (FAAH) inhibitor PF-3845 acts in the nervous system to reverse LPS-induced tactile allodynia in mice  
(full – 2012)
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3423256/

The monoacylglycerol lipase inhibitor JZL184 suppresses inflammatory pain in the mouse carrageenan model.  
(full – 2013)
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3717616/

Dual Inhibition of Endocannabinoid Catabolic Enzymes Produces Enhanced Anti-Withdrawal Effects in Morphine-Dependent Mice. (abst – 2013)  

Selective inhibition of FAAH produces antidiarrheal and antinociceptive effect mediated by endocannabinoids and cannabinoid-like fatty acid amides. (abst – 2014)  

**PF-04457845** – blocks the breakdown of anandamide

A Systems Pharmacology Perspective on the Clinical Development of Fatty Acid Amide Hydrolase Inhibitors for Pain (full – 2014)  
http://www.nature.com/psp/journal/v3/n1/full/psp201372a.html

**4(PM49)** - CB1 partial agonist

Synthetic cannabinoid quinones: Preparation, in vitro antiproliferative effects and in vivo prostate antitumor activity.  
(abst – 2013)  

**RIMONABANT/ ACOMPLIA/ SR141716/ SR1** – a CB1 & CB2 antagonist, a failed weight loss drug


Cannabinoid receptor type 1 modulates excitatory and inhibitory neurotransmission in mouse colon (full – 2003)  http://ajpgi.physiology.org/content/286/1/G110.full?sid=fc6948f0-78cf-405c-981b-aafaa05ee417c


Ethanol Induces Higher Bec in Cb1 Cannabinoid Receptor Knockout Mice While Decreasing Ethanol Preference. (full – 2005)  http://alcalc.oxfordjournals.org/content/40/1/54.long
Activation of the Peripheral Endocannabinoid System in Human Obesity  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2228268/?tool=pmcentrez

Enhancing Cannabinoid Neurotransmission Augments the Extinction of Conditioned Fear  
http://www.nature.com/npp/journal/v30/n3/full/1300655a.html

Cannabinoid receptor ligands mediate growth inhibition and cell death in mantle cell lymphoma  

Up-regulation of the endocannabinoid system in the uterus of leptin knockout (ob/ob) mice and implications for fertility  
http://molehr.oxfordjournals.org/content/11/1/21.full

The analgesic activity of paracetamol is prevented by the blockade of cannabinoid CB1 receptors  

The analgesic activity of paracetamol is prevented by the blockade of cannabinoid CB1 receptors.  

The Cannabinoid Cb1 Receptor Antagonist Rimonabant Attenuates the Hypotensive Effect of Smoked Marijuana in Male Smokers.  
http://www.abjonline.com/article/S0002-8703%2805%2901013-6/fulltext

Weight Control in Individuals With Diabetes  
http://care.diabetesjournals.org/content/29/12/2749.full?maxtoshow=&hits=80&RESULTFORMAT=&fulltext=cannabis&searchid=1&FIRSTINDEX=2000&resourcetype=HWCIT

Anxiolytic-like properties of the anandamide transport inhibitor AM404.  
http://www.nature.com/npp/journal/v31/n12/full/1301061a.html

Lack of tolerance to the suppressing effect of rimonabant on chocolate intake in rats.  

Effects of endocannabinoid neurotransmission modulators on brain stimulation reward.  

Acomplia may be dangerous for women of reproductive age  
http://www.xagena.it/news/medicinenews_net_news/1ef4c899cd6f0d5cae3a2ea3a91adc1c.html

Obesity – Acomplia: loss of a few kilos, many questions  
http://www.xagena.it/news/medicinenews_net_news/4b5739d494ab72c2a54540e67fe1c856.html

Big Pharma's Strange Holy Grail: Cannabis Without Euphoria?  
http://www.mapinc.org/drugnews/v06.n899.a05.html

Cross-sensitization and cross-tolerance between exogenous cannabinoid antinociception and endocannabinoid-mediated stress-induced analgesia  
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Cannabinoids as therapeutic agents in cardiovascular disease: a tale of passions and illusions. (full - 2007)

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Single and multiple doses of rimonabant antagonize acute effects of smoked cannabis in male cannabis users. (full - 2007)

http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2689519/?tool=pubmed

Rimonabant (SR141716) exerts anti-proliferative and immunomodulatory effects in human peripheral blood mononuclear cells (full - 2007)

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Cardiovascular Abnormalities in Cirrhosis: the Possible Mechanisms (full - 2007)


Cannabinoid CB1 receptors in the paraventricular nucleus and central control of penile erection: immunocytochemistry, autoradiography and behavioral studies (abst – 2007)


Pharmacological analysis of cannabinoid-induced inhibition of gastric mucosal damage and gastric motility (abst – 2007)


Rimonabant: safety issues (news – 2007)

http://www.xagena.it/news/medicinenews_net_news/09a11be6989d5a0e438dd9e589210a79.html

European watchdog warns about dangers of Acomplia (news - 2007)


Three Long-Term Diet Pills Show Poor Performance, Study Suggests (news - 2007)


FDA Advisory Panel Rejects Obesity Drug (news - 2007)

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text=cannabinoid&searchid=1&FIRSTINDEX=2800&resourcetype=HWCIT

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Caution Urged With New Anti-Obesity Drug In Kids (news - 2008)

http://www.sciencedaily.com/releases/2008/05/080507133326.htm
Cannabinoid-1 receptor inverse agonists: current understanding of mechanism of action and unanswered questions  (full – 2009)
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The psychiatric side-effects of rimonabant.  (full – 2009)

Effects of the cannabinoid CB1 receptor antagonist rimonabant on distinct measures of impulsive behavior in rats.  (full – 2009)
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The endocannabinoid system and diabetes - critical analyses of studies conducted with rimonabant  (full - 2009)
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Cannabinoids for clinicians: the rise and fall of the cannabinoid antagonists  (full – 2009)
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Evaluation of Prevalent Phytocannabinoids in the Acetic Acid Model of Visceral Nociception  (full – 2009)
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Systematic review and meta-analysis on the adverse events of rimonabant treatment: Considerations for its potential use in hepatology  (full - 2009)
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The endocannabinoid system as a link between homoeostatic and hedonic pathways involved in energy balance regulation  (full – 2009)
http://www.nature.com/ijo/journal/v33/n2s/full/ijo200967a.html

Endocannabinoids and cardiovascular prevention: real progress?  (link to PDF - 2009)
http://www.pagepress.org/journals/index.php/hi/article/view/1162

Impairments in Endocannabinoid Signaling and Depressive Illness  (abst -1st page – 2009)

Neurobiology and Systems Physiology of the Endocannabinoid System  (abst – 2009)

Central side-effects of therapies based on CB1 cannabinoid receptor agonists and antagonists: focus on anxiety and depression.  (abst – 2009)

Cannabinoid receptor activation reverses kainate-induced synchronized population burst firing in rat hippocampus  (abst – 2009)


GPR55 ligands promote receptor coupling to multiple signalling pathways. (full – 2010) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2931561/?tool=pubmed

Rehashing endocannabinoid antagonists: can we selectively target the periphery to safely treat obesity and type 2 diabetes? (full – 2010) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2931561/?tool=pubmed


Energetic Metabolism and Human Sperm Motility: Impact of CB1 Receptor Activation (full – 2010) http://endo.endojournals.org/content/151/12/5882.full


The Endocannabinoid System Tonically Regulates Inhibitory Transmission and Depresses the Effect of Ethanol in Central Amygdala (full - 2010) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2904853/


Reduced neural response to reward following 7 days treatment with the cannabinoid CB1 antagonist rimonabant in healthy volunteers (abst – 2010)
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Risk of suicide spurs rimonabant trial to end.  (news – 2010) http://www.thefreelibrary.com/Risk+of+suicide+spurs+rimonabant+trial+to+end.-a0238838571


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Sex Differences in Cannabinoid 1 vs. Cannabinoid 2 Receptor-Selective Antagonism of Antinociception Produced by Δ9-Tetrahydrocannabinol and CP55,940 in the Rat (full – 2011) http://jpet.aspetjournals.org/content/340/3/787.full


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The central cannabinoid CB1 receptor is required for diet-induced obesity and rimonabrant's antiobesity effects in mice (abst – 2011)  http://www.ncbi.nlm.nih.gov/pubmed/21799481


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The cannabinoid CB1 receptor antagonists rimonabant (SR141716) and AM251 directly potentiate GABAA receptors (full – 2012)  

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The cannabinoid receptor CB1 modulates the signaling properties of the lysophosphatidylinositol receptor GPR55. (full – 2012)  
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Rimonabant eliminates responsiveness to workload changes in a time-constrained food-reinforced progressive ratio procedure in rats. (full – 2012)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3387812/

Rimonabant improves obesity but not the overall cardiovascular risk and quality of life; results from CARDIO-REDUSE (CArdiometabolic Risk reDuctIOn by Rimonabant: the Effectiveness in Daily practice and its USE) (full – 2012)  
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How Weed Can Protect Us From Cancer and Alzheimer's (book excerpt – 2012)  
http://www.alternet.org/story/156269/how_weed_can_protect_us_from_cancer_and_alzheimer%27s

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CB1 blockade-induced weight loss over 48 weeks decreases liver fat in proportion to weight loss in humans (abst – 2014) http://www.nature.com/ijo/journal/v37/n5/full/ijo2012116a.html


R(+)-METHANANANDAMIDE / AM-356 – anandamide analog


Up-Regulation of Cyclooxygenase-2 Expression Is Involved in R(_)-Methanandamide-Induced Apoptotic Death of Human Neuroglioma Cells  (full - 2004)  http://molpharm.aspetjournals.org/content/66/6/1643.full.pdf+html

Cannabinoid Receptor-Mediated Apoptosis Induced by R(+) - Methanandamide and Win55,212-2 Is Associated with Ceramide Accumulation and p38 Activation in Mantle Cell Lymphoma  (full - 2006)  http://molpharm.aspetjournals.org/content/70/5/1612.full

R(+)-methanandamide and other cannabinoids induce the expression of cyclooxygenase-2 and matrix metalloproteinases in human nonpigmented ciliary epithelial cells.  (full – 2006)  http://jpethquivos.aspetjournals.org/content/316/3/1219.long


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Expression of cannabinoid receptors type 1 and type 2 in non-Hodgkin lymphoma: growth inhibition by receptor activation. (full – 2008)  

Inhibition of human tumour prostate PC-3 cell growth by cannabinoids R(+)-Methanandamide and JWH-015: Involvement of CB2 (full - 2009)  
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Potentiation of cannabinoid-induced cytotoxicity in mantle cell lymphoma through modulation of ceramide metabolism. (full - 2009)  
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Cannabinoid Receptor Activation Protects Coronary Endothelium Against Reperfusion Induced Intercellular Gap Formation in a Cellular Model of Ischemia and Reperfusion (abst - 2009)  
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The cannabinoid R+ methanandamide induces IL-6 secretion by prostate cancer PC3 cells. (abst - 2009)  


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Anandamide capacitates bull spermatozoa through CB1 and TRPV1 activation. (full – 2011)  
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Cannabidiol inhibits lung cancer cell invasion and metastasis via intercellular adhesion molecule-1. (full – 2011)  
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Anandamide Induces Sperm Release from Oviductal Epithelia through Nitric Oxide Pathway in Bovines. (full – 2012)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3281848/?tool=pubmed
Neonatal DSP-4 Treatment Modifies Antinociceptive Effects of the CB(1) Receptor Agonist Methanandamide in Adult Rats. (full – 2012) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3526738/


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A new strategy to block tumor angiogenesis by inhibiting endocannabinoid inactivation (abst – 2013) http://www.fasebj.org/cgi/content/meeting_abstract/27/1_MeetingAbstracts/1105.6?sid=eea722c0-971c-4daa-8b8c-38c0c63c19ad


**RWJ 400065** - CB 2 agonist

Control of spasticity in a multiple sclerosis model is mediated by CB1, not CB2, cannabinoid receptors. (full – 2007)
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**S-444823** – CB1 & CB2 agonist

Discovery of S-444823, a potent CB1/CB2 dual agonist as an antipruritic agent.

**SAB-378** – activates only peripheral CB1 and CB2 receptors, no high

CB1 receptors mediate the analgesic effects of cannabinoids on colorectal distension-induced visceral pain in rodents. (full – 2007)
http://www.jneurosci.org/content/29/5/1554.long

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Naphthalen-1-yl-(4-pentyloxynaphthalen-1-yl)methanone (SAB378), a peripherally restricted cannabinoid CB1/CB2 receptor agonist, inhibits gastrointestinal motility but has no effect on experimental colitis in mice. (full – 2010)
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Control of spasticity in a multiple sclerosis model using central nervous system-excluded CB1 cannabinoid receptor agonists. (abst – 2013)

**SAD-448** – activates only peripheral CB1 receptors, no high

Control of spasticity in a multiple sclerosis model using central nervous system-excluded CB1 cannabinoid receptor agonists. (abst – 2013)
**SPICE – NEWS** - various synthetic cannabinoid mixtures - also see the AM, HU, JWH, and CP series

Synthetic cannabis mimic found in herbal incense (news – 2009)  

Inhaled Incense “K2” May Cause Heart Damage (news – 2010)  
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1 in 9 high school seniors using synthetic marijuana (news – 2011)  

'Fake Marijuana' May Trigger Heart Trouble in Teens (news – 2011)  

Texas teens had heart attacks after smoking K2 (news – 2011)  

Chemicals Used in "Spice" and "K2" Type Products Now Under Federal Control and Regulation (news – 2011)  
http://www.justice.gov/dea/pubs/pressrel/pr030111.html

Synthetic cannabis linked to extended psychosis (news – 2011)  

'Hammer Head' 'incense' blamed for seizure of youth in Le Roy (news – 2012)  

Synthetic marijuana was created strictly for research at Clemson (news – 2012)  
http://www.timesnews.net/article/9042095/synthetic-marijuana-was-created-strictly-for-research-at-clemson

Why K2 is Pimps’ Choice for Controlling Young Sex Workers (news – 2012)  

Outbreak of kidney failure in Wyoming linked to "Spice" (news – 2012)  
http://www.reuters.com/article/2012/03/03/us-spice-illness-wyoming-idUSTRE82204T20120303
'Spice'-y Party Drugs Can Lead to the ED  (news – 2012)

Wyoming kidney failure outbreak linked to designer 'blueberry spice' drug, aka 'legal marijuana'  (news – 2012)

Blueberry “spice” in Wyoming linked to cases of renal failure  (news – 2012)
http://www.thepoisonreview.com/2012/03/03/blueberry-spice-in-wyoming-linked-to-cases-of-renal-failure/

New health concerns about 'fake pot' in US  (news – 2012)

Tachycardia followed by bradycardia after smoking the synthetic cannabinoid “K9”  (news – 2012)

Synthetic marijuana sent more than 11,400 people to ER in 2010  (news – 2012)

With Labs Pumping Out Legal Highs, China Is the New Front in the Global Drug War  (news – 2013)

Teen narrowly escapes death after smoking synthetic marijuana  (news – 2013)

Synthetic Marijuana Dangerous for Kidneys  (news – 2013)
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Study: Consumers Prefer Natural Cannabis Over Synthetic 'Marijuana' Herbal Products  (news – 2013)
http://norml.org/news/2013/01/10/study-consumers-prefer-natural-cannabis-over-synthetic-marijuana-herbal-products

Synthetic Marijuana Harms Kidneys of 16 Users, CDC Reports  (news - 2013)

Synthetic cannabis: how it's made, what's in it  (news – 2013)

Death link to synthetic cannabis  (news – 2013)
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Synthetic drugs carry risk of kidney damage  (news – 2013)

High K2 use rate among psych unit patients  (news – 2013)
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Withdrawal Phenomena and Dependence Syndrome After the Consumption of "Spice Gold"  (full - 2009)  http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2719097/?tool=pmcentrez


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Synthetic cannabinoid use: a case series of adolescents. (abst – 2011)  

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Synthetic cannabinoids and potential reproductive consequences. (abst – 2013)


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Toxicological Findings of Synthetic Cannabinoids in Recreational Users. (abst – 2013)

The secret "spice": an undetectable toxic cause of seizure. (abst – 2013)


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Cytotoxicity of synthetic cannabinoids on primary neuronal cells of the forebrain: the involvement of cannabinoid CB1 receptors and apoptotic cell death (abst – 2013) http://www.sciencedirect.com/science/article/pii/S0041008X13004766


**SR-144528** - CB(2) receptor antagonist


CB1 receptors mediate the analgesic effects of cannabinoids on colorectal distension-induced visceral pain in rodents. (full – 2007) http://www.jneurosci.org/content/29/5/1554.long

CB2 Cannabinoid Receptors Promote Neural Progenitor Cell Proliferation via mTORC1 Signaling (full – 2011) http://www.jbc.org/content/287/2/1198.full


The effects of peptide and lipid endocannabinoids on arthritic pain at the spinal level. (full – 2012)


Effects of the cannabinoid 2 receptor-selective agonist GW405833 in assays of acute pain-stimulated and paindepressed behavior in rats (abst – 2013) http://www.fasebj.org/cgi/content/meeting_abstract/27/1_MeetingAbstracts/886.9?sid=eea722c0-971c-4daa-8b8c-38c0c63c19ad


**SURINABANT** - CB1 antagonist

**TAK-875 - GPR-40 agonist**

TAK-875, an orally available G protein-coupled receptor 40/free fatty acid receptor 1 agonist, enhances glucose-dependent insulin secretion and improves both postprandial and fasting hyperglycemia in type 2 diabetic rats.  

Takeda moves potential first-in-class diabetes drug into phase III  

A Multiple-Ascending-Dose Study to Evaluate Safety, Pharmacokinetics, and Pharmacodynamics of a Novel GPR40 Agonist, TAK-875, in Subjects With Type 2 Diabetes.  

Optimization of (2,3-dihydro-1-benzofuran-3-yl)acetic acids: discovery of a non-free fatty acid-like, highly bioavailable G protein-coupled receptor 40/free fatty acid receptor 1 agonist as a glucose-dependent insulinotropic agent.  

TAK-875 versus placebo or glimepiride in type 2 diabetes mellitus: a phase 2, randomised, double-blind, placebo-controlled trial.  

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**TAK-937 - CB1 & CB2 agonist**

Contribution of Hypothermia and CB(1) Receptor Activation to Protective Effects of TAK-937, a Cannabinoid Receptor Agonist, in Rat Transient MCAO Model.  
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Cerebroprotective effects of TAK-937, a novel cannabinoid receptor agonist, in permanent and thrombotic focal cerebral ischemia in rats: Therapeutic time window, combination with t-PA and efficacy in aged rats.  

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**TARANABANT/ MK-0364 - CB1 inverse agonist, a weight loss drug**
The discovery of taranabant, a selective cannabinoid-1 receptor inverse agonist for the treatment of obesity. (full – 2008)  

Taranabant, a novel cannabinoid type 1 receptor inverse agonist.  (abst – 2008)  

Influence of taranabant, a cannabinoid-1 receptor inverse agonist, on pharmacokinetics and pharmacodynamics of warfarin.  (abst – 2009)  

Cannabinoid-1 receptor inverse agonists: current understanding of mechanism of action and unanswered questions  (full – 2009)  
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Central side-effects of therapies based on CB1 cannabinoid receptor agonists and antagonists: focus on anxiety and depression.  (abst – 2009)  

Development of a population pharmacokinetic model for taranabant, a cannabinoid-1 receptor inverse agonist.  (full – 2010)  
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Central and peripheral consequences of the chronic blockade of CB1 cannabinoid receptor with rimonabant or taranabant.  (full – 2010)  

A one-year study to assess the safety and efficacy of the CB1R inverse agonist taranabant in overweight and obese patients with type 2 diabetes.  (abst – 2010)  

A clinical trial assessing the safety and efficacy of the CB1R inverse agonist taranabant in obese and overweight patients: low-dose study  (abst – 2010)  
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Randomized, controlled, double-blind trial of taranabant for smoking cessation  (abst – 2010)  

Metabolism and excretion of [14C]taranabant, a cannabinoid-1 inverse agonist, in humans.  (abst – 2010)  

Neuropsychiatric adverse effects of centrally acting antiobesity drugs.  (abst – 2011)  

Human abuse potential and cognitive effects of taranabant, a cannabinoid 1 receptor inverse agonist: a randomized, double-blind, placebo- and active-controlled, crossover study in recreational polydrug users.  (abst – 2012)  
The cannabinoid-1 receptor inverse agonist taranabant reduces abdominal pain and increases intestinal transit in mice.  
(abst – 2013)  

Development of amorphous solid dispersion formulations of a poorly water-soluble drug, MK-0364.  
(abst – 2013)  

**TM38837** - a mostly peripherally restricted CB1 antagonist

Experimental obesity drug avoids brain effects that troubled predecessors  
(news – 2010)  
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Low brain CB1 receptor occupancy by a second generation CB1 receptor antagonist TM38837 in comparison with rimonabant in nonhuman primates: A PET study.  
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Peripheral selectivity of the novel cannabinoid receptor antagonist TM38837 in healthy subjects.  
(abst – 2013)  

**UR-144**  – CB1 antagonist

URB-754: A new class of designer drug and 12 synthetic cannabinoids detected in illegal products.  
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Detection of urinary metabolites of AM-2201 and UR-144, two novel synthetic cannabinoids.  
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Cannabinoids in disguise: Δ9-tetrahydrocannabinol-like effects of tetramethylcyclopropyl ketone indoles.  
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Analysis of UR-144 and its pyrolysis product in blood and their metabolites in urine.  
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First Metabolic Profile of XLR-11, a Novel Synthetic Cannabinoid, Obtained by Using Human Hepatocytes and High-Resolution Mass Spectrometry.  
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Toxicological Findings of Synthetic Cannabinoids in Recreational Users.  
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**URB-447** – CB1 antagonist


**URB-532** - slows cannabinoid destruction

The postmortal accumulation of brain N-arachidonylethanolamine (anandamide) is dependent upon fatty acid amide hydrolase activity. (full – 2005) http://www.jlr.org/content/46/2/342.long

**URB-597 / KDS-4103** - slows cannabinoid destruction in the body, not the brain.


Antidepressant-like Activity and Modulation of Brain Monoaminergic Transmission by Blockade of Anandamide Hydrolysis.  (full – 2005)
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Depression: URB597 increases endocannabinoids in brain (news – 2005)
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Parkinsons' Helped By Marijuana-Like Chemicals In Brain (news – 2007)
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Anti-dyskinetic effects of cannabinoids in a rat model of Parkinson's disease: role of CB1 and TRPV1 receptors (full - 2007)
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Acute hypertension reveals depressor and vasodilator effects of cannabinoids in conscious rats (full - 2008)  
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Pharmacological enhancement of endocannabinoid signaling reduces the cholinergic toxicity of diisopropylfluorophosphate. (full – 2008)  
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Inhibition of anandamide hydrolysis by URB597 reverses abuse-related behavior and neurochemical effects of nicotine in rats (abst – 2008)  
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Targeting endocannabinoid degradation protects against experimental colitis in mice: involvement of CB1 and CB2 receptors. (abst – 2008)  

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A new drug that kills pain like marijuana, without getting you stoned (news – 2010)

Pain target enzyme's working made crystal clear (news – 2010)

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L-Type Calcium Channel Mediates Anticonvulsant Effect of Cannabinoids in Acute and Chronic Murine Models of Seizure. (abst – 2011)

Pharmacological elevation of anandamide impairs short-term memory by altering the neurophysiology in the hippocampus. (abst – 2011)

Fatty acid amide hydrolase blockade attenuates the development of collagen-induced arthritis and related thermal hyperalgesia in mice. (abst - 2011)

The endocannabinoid, anandamide, augments Notch-1 signaling in cultured cortical neurons exposed to amyloid-beta and in the cortex of aged rats. (full – 2012) http://www.jbc.org/content/early/2012/08/13/jbc.M112.350678.long

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The association of N-palmitoylethanolamine with the FAAH inhibitor URB597 impairs melanoma growth through a supra-additive action (full – 2012) http://www.biomedcentral.com/1471-2407/12/92

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The fatty acid amide hydrolase (FAAH) inhibitor PF-3845 acts in the nervous system to reverse LPS-induced tactile allodynia in mice (full – 2012) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3423256/

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The FAAH inhibitor URB597 efficiently reduces tyrosine hydroxylase expression through CB1 and FAAH-independent mechanisms.  
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Pharmacological modulation of the endocannabinoid signalling alters binge-type eating behaviour in female rats  
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Modulating the endocannabinoid system in human health and disease: successes and failures  
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Full Inhibition of Spinal FAAH Leads to TRPV1-Mediated Analgesic Effects in Neuropathic Rats and Possible Lipoxygenase-Mediated Remodeling of Anandamide Metabolism  
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Effects of compounds that interfere with the endocannabinoid system on behaviors predictive of anxiolytic and panicolytic activity in the elevated T-maze (abst – 2013) http://www.ncbi.nlm.nih.gov/pubmed/23711591


Effects of the fatty acid amide hydrolase inhibitor URB597 on coping behavior under challenging conditions in mice. (abst – 2013) http://www.ncbi.nlm.nih.gov/pubmed/24037493


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Endocannabinoid Signaling in Hypothalamic-Pituitary-Adrenocortical Axis Recovery Following Stress: Effects of Indirect Agonists and Comparison of Male and Female Mice. (abst – 2013)  

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Pharmacological enhancement of endocannabinoid signaling reduces the cholinergic toxicity of diisopropylfluorophosphate. (full – 2008)  
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Inhibition of COX-2 expression by endocannabinoid 2-arachidonoylglycerol is mediated via PPAR-γ (full – 2011)  

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**URB-754** - slows cannabinoid destruction

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URB-754: A new class of designer drug and 12 synthetic cannabinoids detected in illegal products. (abst – 2012)  

**URB-937** - slows cannabinoid destruction

Compound boosts marijuana-like chemical in the body to relieve pain at injury site (news - 2010)  http://www.eurekalert.org/pub_releases/2010-09/uoc-cbm092010.php


VD-60 - peripheral cannabinoid receptor 1 antagonist


WIN 55,212-2 - CB1 & CB2 agonist


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XLR-11 – potent CB1 & CB2 agonist

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