GENETICS of the ENDOCANNABINOID SYSTEM – Section under construction

ENDOCANNABINOID SYSTEM GENETICS – ANIMAL also see KNOCK-OUT MICE


Cannabinoid receptor type 1 receptors on GABAergic vs. glutamatergic neurons differentially gate sex-dependent social interest in mice. (abst – 2014) http://www.ncbi.nlm.nih.gov/pubmed/24698342


ENDOCANNABINOID SYSTEM GENETICS - HUMAN *

ABHD12 GENES – cause production of an enzyme that breaks down 2-AG

Mutations in ABHD12 Cause the Neurodegenerative Disease PHARC: An Inborn Error of Endocannabinoid Metabolism (full – 2011) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2933347/?tool=pubmed

Targeted next-generation sequencing identifies a homozygous nonsense mutation in ABHD12, the gene underlying PHARC, in a family clinically diagnosed with Usher syndrome type 3 (full – 2012) http://www.ojrd.com/content/7/1/59

**ATT / (ATT)n GENES**

(AAT)n repeat in the cannabinoid receptor gene (CNR1): association with cocaine addiction in an African-Caribbean population  
(full – 2006)  
http://www.nature.com/tpj/journal/v6/n2/full/6500352a.html

Sweet taste and (AAT)12 repeat in the cannabinoid receptor gene in obese females  
(letter – 2011)  

Lack of association of genetic variants in genes of the endocannabinoid system with anorexia nervosa  
(full - 2008)  
http://www.capmh.com/content/2/1/33

Association of the Cannabinoid Receptor Gene (CNR1) With ADHD and Post-Traumatic Stress Disorder  
(full - 2008)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2685476/?tool=pubmed

Cannabinoid receptor 1 gene (CNR1) and susceptibility to a quantitative phenotype for hebephrenic schizophrenia.  
(abst – 2008)  

Association between a cannabinoid receptor gene (CNR1) polymorphism and cannabinoid-induced alterations of the auditory event-related P300 potential.  
(abst – 2011)  
http://www.unboundmedicine.com/medline/ebm/record/21513772/abstract/Association_between_a_cannabinoid_receptor_gene__CNR1__polymorphism_and_cannabinoid_induced_alterations_of_the_auditory_event_related_P300_potential

Association between a Genetic Variant of Type-1 Cannabinoid Receptor and Inflammatory Neurodegeneration in Multiple Sclerosis  
(full – 2013)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3877004/

Cannabinoid Receptor 1 Gene and Irritable Bowel Syndrome: Phenotype and Quantitative Traits.  
(full – 2013)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3602676/

CNR1 variation is associated with the age at onset in Huntington disease.  
(abst – 2013)  

Association of cannabinoid type 1 receptor and fatty acid amide hydrolase genetic polymorphisms in Chinese patients with irritable bowel syndrome.  
(abst – 2014)  
CB 1 GENES - RS1049353 / G1359 G/A


Endocannabinoid receptor 1 gene variations increase risk for obesity and modulate body mass index in European populations (full – 2008) http://hmg.oxfordjournals.org/content/17/13/1916.long


Cannabinoid type-1 receptor gene polymorphisms are associated with central obesity in a Southern Brazilian population (abst – 2008) http://iospress.metapress.com/content/p42u458n7608461g/?p=ff122a13e6cf4bf78324e26d253bd883&pi=5


A common polymorphism in the cannabinoid receptor 1 (CNR1) gene is associated with antipsychotic-induced weight gain in Schizophrenia. (full – 2010) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3055343/?tool=pubmed

The Cannabinoid 1 Receptor (CNR1) 1359 G/A Polymorphism Modulates Susceptibility to Ulcerative Colitis and the Phenotype in Crohn's Disease (full - 2010) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2829088/?tool=pmcentrez

Polymorphisms in the endocannabinoid receptor 1 in relation to fat mass distribution (full – 2010) http://www.eje-online.org/content/163/3/407.full

G1359A polymorphism of the cannabinoid receptor gene (CNR1) and clinical results of biliopancreatic diversion (link to PDF – 2010) http://www.europeanreview.org/article/724
G1359A polymorphism in the cannabinoid receptor-1 gene is associated with metabolic syndrome in the Chinese Han population. (abst – 2010)  

Roles of G1359A polymorphism of the cannabinoid receptor gene (CNR1) on weight loss and adipocytokines after a hypocaloric diet (full – 2011)  

The association of the rs1049353 polymorphism of the CNR1 gene with hypoadiponectinemia. (full – 2011)  

G1359A polymorphism in the cannabinoid receptor-1 gene is associated with coronary artery disease in the Chinese Han population. (abst – 2011)  

Cannabinoid Receptor Genotype Moderation of the Effects of Childhood Physical Abuse on Anhedonia and Depression. (full – 2012)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3706194/

Failure to extinguish fear and genetic variability in the human cannabinoid receptor 1. (full – 2012)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3565211/

Cannabinoid Type 1 Receptor Gene Polymorphism and Macronutrient Intake. (full – 2012)  
http://www.karger.com/Article/FullText/343563

Childhood Obesity and the Role of Dopamine D2 Receptor and Cannabinoid Receptor-1 Gene Polymorphisms. (abst – 2012)  

The G1359A-CNR1 gene polymorphism is associated to glioma in Spanish patients (abst – 2012)  
http://link.springer.com/article/10.1007%2Fs12094-010-0604-7#page-1

G1359A polymorphism in the cannabinoid receptor-1 gene is associated with the presence of coronary artery disease in patients with type 2 diabetes. (abst – 2012)  

Genetic variability in the endocannabinoid system and 12-week clinical response to citalopram treatment: the role of the CNR1, CNR2 and FAAH genes (abst – 2012)  
http://jop.sagepub.com/content/26/10/1391

Role of G1359A polymorphism of the cannabinoid receptor gene on weight loss and adipocytokines levels after two different hypocaloric diets. (abst – 2012)  

Influence of G1359A polymorphism of the cannabinoid receptor gene (CNR1) on insulin resistance and adipokines in patients with non alcoholic fatty liver disease. (full – 2013)
Role of Genetic Variation in the Cannabinoid Receptor Gene (CNR1) (G1359A Polymorphism) on Weight Loss and Cardiovascular Risk Factors After Liraglutide Treatment in Obese Patients With Diabetes Mellitus Type 2. (abst – 2013) http://www.ncbi.nlm.nih.gov/pubmed/24322329

Genetic variation in the cannabinoid receptor gene (CNR1) (G1359A polymorphism) and their influence on anthropometric parameters and metabolic parameters under a high monounsaturated vs. high polyunsaturated fat hypocaloric diets. (abst – 2013) http://www.ncbi.nlm.nih.gov/pubmed/23337343


Screening genetic variability at the CNR1 gene in both major depression etiology and clinical response to citalopram treatment. (abst – 2013) http://link.springer.com/article/10.1007%2Fs00213-013-2995-y


**CB 1 GENES – various polymorphisms**


Depression in Parkinson's disease is related to a genetic polymorphism of the cannabinoid receptor gene (CNR1) (full - 2005)
http://www.nature.com/tpj/journal/v5/n2/full/6500301a.html

Genetic variations at the endocannabinoid type 1 receptor gene (CNR1) are associated with obesity phenotypes in men. (full – 2007)
http://jcem.endojournals.org/content/92/6/2382.long

Genotype effects of CHRNA7, CNR1 and COMT in schizophrenia: interactions with tobacco and cannabis use. (full – 2007)
http://bip.rcpsych.org/content/191/5/402.long

No evidence for an involvement of variants in the cannabinoid receptor gene (CNR1) in obesity in German children and adolescents. (abst – 2007)  

Variations in the cannabinoid receptor 1 gene predispose to migraine. (abst – 2009)  

The use and misuse of alcohol and marijuana can be traced to a common set of genes (news – 2009)  

Cannabis and smoking gene links to schizophrenia ‘unfounded’ (news – 2009)
http://www.medwirenews.com/47/71003/Psychiatry/Cannabis_and_smoking_gene_links_to_schizophrenia_%E2%80%98unfounded%E2%80%99.html

A common polymorphism in the cannabinoid receptor 1 (CNR1) gene is associated with antipsychotic-induced weight gain in Schizophrenia. (full – 2010)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3055343/?tool=pubmed

A common CNR1 (cannabinoid receptor 1) haplotype attenuates the decrease in HDL cholesterol that typically accompanies weight gain. (full – 2010)  
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Polymorphisms in the endocannabinoid receptor 1 in relation to fat mass distribution (full – 2010)  
http://www.eje-online.org/content/163/3/407.full

Endocannabinoids and Schizophrenia (link to PDF – 2010)  
http://www.mdpi.com/1424-8247/3/10/3101

Differential signaling in human cannabinoid CB(1) receptors and their splice variants in autaptic hippocampal neurons (full – 2011)  

Adipose tissue endocannabinoid system gene expression: depot differences and effects of diet and exercise (full – 2011)  
http://www.lipidworld.com/content/10/1/194

The Endocannabinoid System as Pharmacological Target Derived from Its CNS Role in Energy Homeostasis and Reward. Applications in Eating Disorders and Addiction
Cannabinoid Receptor 1 (CNR1) 4895 C/T Genetic Polymorphism was Associated with Obesity in Japanese Men. (full – 2012)  
https://www.jstage.jst.go.jp/article/jat/19/8/19_12732/_pdf

Binding of a tritiated inverse agonist to cannabinoid CB1 receptors is increased in patients with schizophrenia (full – 2012)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3463751/

The dynamic nature of type 1 cannabinoid receptor (CB1) gene transcription (full - 2012)  

Randomized pharmacodynamic and pharmacogenetic trial of dronabinol effects on colon transit in irritable bowel syndrome-diarrhea. (full – 2012)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3775711/

Irritable Bowel Syndrome: Methods, Mechanisms, and Pathophysiology. Genetic epidemiology and pharmacogenetics in irritable bowel syndrome (full – 2012)  
http://ajpgi.physiology.org/content/302/10/G1075

CNR1 genotype influences HDL-cholesterol response to change in dietary fat intake. (full – 2012)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3342253/

Sensation-seeking genes and physical activity in youth (full – 2012)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3581711/

Childhood Obesity and the Role of Dopamine D2 Receptor and Cannabinoid Receptor-1 Gene Polymorphisms. (abst – 2012)  

The genetic basis of the endocannabinoid system and drug addiction in humans (abst – 2012)  

Genetic variability in the endocannabinoid system and 12-week clinical response to citalopram treatment: the role of the CNR1, CNR2 and FAAH genes (abst – 2012)  
http://jop.sagepub.com/content/26/10/1391

'Cannabis' receptor discovery may help understanding of obesity and pain (news – 2012)  

Molecular basis for dramatic changes in cannabinoid CB1 G protein-coupled receptor activation upon single and double point mutations. (full - 2013)  

Activation-dependent plasticity of polarized GPCR distribution on the neuronal surface. (full – 2013)  
http://jmcb.oxfordjournals.org/content/5/4/250.long
Novel Insights Into CB1 Cannabinoid Receptor Signaling: A Key Interaction Identified Between EC3-Loop and TMH2. (full – 2013)  
http://jpet.aspetjournals.org/content/early/2013/02/21/jpet.112.201046.long

Moderation of antipsychotic-induced weight gain by energy balance gene variants in the RUPP autism network risperidone studies (full – 2013)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3693401/

Cannabis, a complex plant: different compounds and different effects on individuals (full – 2013)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3736954/

Further evidence for association of polymorphisms in the CNR1 gene with cocaine addiction: confirmation in an independent sample and meta-analysis (full – 2013)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3223560/

Evidence for a Common Endocannabinoid-Related Pathomechanism in Autism Spectrum Disorders (link to full – 2013)  

Evidence for the involvement of cannabinoid receptors' polymorphisms in the pathophysiology of human diseases. (abst – 2013)  

CNR1 Gene and Risk of the Metabolic Syndrome in Patients With Schizophrenia. (abst – 2013)  

Computationally-predicted CB1 cannabinoid receptor mutants show distinct patterns of salt-bridges that correlate with their level of constitutive activity reflected in G protein coupling levels, thermal stability, and ligand binding. (abst – 2013)  

Interrogating Therapeutic Manipulation of the Endocannabinoid System in Human Colon (abst – 2013)  
http://www.fasebj.org/cgi/content/meeting_abstract/26/1_MeetingAbstracts/1123.1?sid=eea722c0-971c-4daa-8b8c-38c0e63c19ad

No association of endocannabinoid genes with bipolar disorder or lithium response in a Sardinian sample. (abst – 2013)  

Performance in working memory and attentional control is associated with the rs2180619 SNP in the CNR1 gene. (abst – 2013)  

Impulsivity, Variation in the Cannabinoid Receptor (CNR1) and Fatty Acid Amide Hydrolase (FAAH) Genes, and Marijuana-Related Problems. (abst – 2013)  

A Link Between Autism and Cannabinoids (news – 2013)

Endocannabinoid Receptors Gene Expression in Morbidly Obese Women with Nonalcoholic Fatty Liver Disease (full – 2014) http://www.hindawi.com/journals/bmri/2014/502542/


**CB 2 GENES**

Reduced endocannabinoid immune modulation by a common cannabinoid 2 (CB2) receptor gene polymorphism: possible risk for autoimmune disorders. (full – 2005) http://www.jleukbio.org/content/78/1/231.long

Cannabinoid receptor type 2 gene is associated with human osteoporosis (full - 2005) http://hmg.oxfordjournals.org/cgi/content/full/14/22/3389?maxtoshow=&hits=80&RESULTFORMAT=&fulltext=cannabinoid&searchid=1&FIRSTINDEX=400&resourcetype=HWCIT

Comparison Analysis of Gene Expression Patterns between Sporadic Alzheimer's and Parkinson's Disease (abst – 2007) http://iospress.metapress.com/content/336t86725725564t/?p=00368d67a25c414b9e1ecc38b534bdfc&pi=10


CNR2 functional variant (Q63R) influences childhood immune thrombocytopenic purpura. (full – 2011) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3232275/


Genetic variability in the endocannabinoid system and 12-week clinical response to citalopram treatment: the role of the CNR1, CNR2 and FAAH genes  (abst – 2012)  
http://jop.sagepub.com/content/26/10/1391


The Cannabinoid Receptor type 2 Q63R variant increases the risk of celiac disease: Implication for a novel molecular biomarker and future therapeutic intervention.  (abst – 2012)  


Cannabis, a complex plant: different compounds and different effects on individuals  (full – 2013)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3736954/

Childhood immune thrombocytopenia-who will spontaneously recover?  (full – 2013)  
http://www.seminhematol.org/article/S0037-1963%2813%2900032-2/fulltext

Evidence for the involvement of cannabinoid receptors' polymorphisms in the pathophysiology of human diseases.  (abst – 2013)  

Cannabinoid CB2 receptor gene (CNR2) polymorphism is associated with chronic childhood immune thrombocytopenia in Egypt.  (abst – 2013)  

Interrogating Therapeutic Manipulation of the Endocannabinoid System in Human Colon  (abst – 2013)  
http://www.fasebj.org/cgi/content/meeting_abstract/26/1_MeetingAbstracts/1123.1?sid=eea722c0-971c-4daa-8b8c-38c0c63c19ad

Association Between a Polymorphism in Cannabinoid Receptor 2 and Severe Nécroinflammation in Patients With Chronic Hepatitis C.  (abst – 2013)  

Polymorphism rs3123554 in CNR2 reveals gender-specific effects on body weight and affects loss of body weight and cerebral insulin action.  (abst – 2013)  


Differential expression and functional role of cannabinoid genes in alcohol users.
Endocannabinoid Receptors Gene Expression in Morbidly Obese Women with Nonalcoholic Fatty Liver Disease  (full – 2014)
http://www.hindawi.com/journals/bmri/2014/502542/

Cannabinoid Receptor 2-63 QQ Variant Is Associated with Persistently Normal Aminotransferase Serum Levels in Chronic Hepatitis C  (full - 2014)
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4062424/

Cannabinoid Receptor 2-63 QQ Variant Is Associated with Persistently Normal Aminotransferase Serum Levels in Chronic Hepatitis C  (full - 2014)
http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0099450

The in vitro GcMAF effects on endocannabinoid system transcriptionomics, receptor formation, and cell activity of autism-derived macrophages.  (full – 2014)
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3996516/

Synthetic marijuana "K2" induced ITP.  (abst – 2014)

Genetic association analysis of CNR1 and CNR2 polymorphisms with schizophrenia in a Korean population.  (abst – 2014)

**COMT GENES**

Genotype effects of CHRNA7, CNR1 and COMT in schizophrenia: interactions with tobacco and cannabis use.  (full – 2007)
http://bjp.rcpsych.org/content/191/5/402.long

Cannabis and smoking gene links to schizophrenia ‘unfounded’  (news – 2009)
http://www.medwirenews.com/47/71003/Psychiatry/Cannabis_and_smoking_gene_links_to_schizophrenia_%E2%80%98unfounded%E2%80%99.html

Molecular mechanisms underlying anorexia nervosa: focus on human gene association studies and systems controlling food intake.  (abst – 2010)

Cannabis, COMT and psychotic experiences.  (full – 2011)
http://bjp.rcpsych.org/content/199/5/380.long

COMT; another “wrong” result for the reefer madness hype  (news – 2011)
http://ukcia.org/wordpress/?p=924
COMT val158met and 5-HTTLPR genetic polymorphisms moderate executive control in cannabis users  (full – 2013)  http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3682154/


Cannabis, COMT and psychotic experiences.  (full – 2011)  http://bip.rcpsych.org/content/199/5/380.long

What does a mouse tell us about neuregulin 1-cannabis interactions?  (full – 2013)  http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3581817/

**CYP GENES** - production of their enzymes is blocked by THC, CBD and CBN

Effects of a Commonly Occurring Genetic Polymorphism of Human CYP3A4 (I118V) on the Metabolism of Anandamide  (full – 2010)  http://dmd.aspetjournals.org/content/38/11/2075.full


Cannabidiol, a major phytocannabinoid, as a potent atypical inhibitor for CYP2D6.  (full – 2011)  http://dmd.aspetjournals.org/content/39/11/2049.full.pdf+html

Genome-wide association study of antibody response to smallpox vaccine.  (full – 2012)  http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3367131/

Functional consequences of synthetic cannabinoid metabolites and CYP2C9 polymorphisms  (abst – 2014)  http://www.fasebj.org/content/28/1_Supplement/838.4.abstract?sid=467bb529-0ecc-4ddc-af27-3f56f520a102

**FAAH GENES - RS324420 / C385A , RS324419 , etc**

Genetic variation in endocannabinoid metabolism, gastrointestinal motility, and sensation (full - 2007)  http://ajpgi.physiology.org/cgi/content/full/294/1/G13?maxtoshow=&hits=80&RESULTFORMAT=&fulltext=cannabinoid&searchid=1&FIRSTINDEX=1120&resourcetype=HWCIT
The fatty acid amide hydrolase C385A (P129T) missense variant in cannabis users: studies of drug use and dependence in Caucasians (abst – 2007)  

The role of fatty acid hydrolase gene variants in inflammatory bowel disease. (full – 2009)  

Association of CNR1 and FAAH endocannabinoid gene polymorphisms with anorexia nervosa and bulimia nervosa: evidence for synergistic effects. (full – 2009)  

385 C/A polymorphism of the fatty acid amide hydrolase gene is associated with metabolic syndrome in the Chinese Han population. (full – 2011)  
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3258756/

Adipose tissue endocannabinoid system gene expression: depot differences and effects of diet and exercise (full – 2011)  
http://www.lipidworld.com/content/10/1/194

The Endocannabinoid System as Pharmacological Target Derived from Its CNS Role in Energy Homeostasis and Reward. Applications in Eating Disorders and Addiction (link to PDF - 2011)  

A polymorphism in the gene of the endocannabinoid-degrading enzyme FAAH (FAAH C385A) is associated with emotional–motivational reactivity (full – 2012)  

Irritable Bowel Syndrome: Methods, Mechanisms, and Pathophysiology. Genetic epidemiology and pharmacogenetics in irritable bowel syndrome (full – 2012)  
http://ajpgi.physiology.org/content/302/10/G1075

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http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3775711/

The genetic basis of the endocannabinoid system and drug addiction in humans (abst – 2012)  

Investigation of endocannabinoid system genes suggests association between peroxisome proliferator activator receptor-α gene (PPARA) and schizophrenia. (abst – 2012)  

Genetic variability in the endocannabinoid system and 12-week clinical response to citalopram treatment: the role of the CNR1, CNR2 and FAAH genes (abst – 2012)  
http://jop.sagepub.com/content/26/10/1391

Contribution of genetic variants to pain susceptibility in Parkinson disease (abst – 2012)  
Moderation of antipsychotic-induced weight gain by energy balance gene variants in the RUPP autism network risperidone studies  (full – 2013)
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3693401/

Evidence for a Common Endocannabinoid-Related Pathomechanism in Autism Spectrum Disorders  (link to full – 2013)

FAAH selectively influences placebo effects.  (abst – 2013)


Impulsivity, Variation in the Cannabinoid Receptor (CNR1) and Fatty Acid Amide Hydrolase (FAAH) Genes, and Marijuana-Related Problems.  (abst – 2013)

Effects of C358A polymorphism of the endocannabinoid degrading enzyme fatty acid amide hydrolase (FAAH) on weight loss, adipocytokines levels, and insulin resistance after a high polyunsaturated fat diet in obese patients.  (abst – 2013)

Association of the c.385C>A (p.Pro129Thr) polymorphism of the fatty acid amide hydrolase gene with anorexia nervosa in the Japanese population  (full – 2014)

Association of cannabinoid type 1 receptor and fatty acid amide hydrolase genetic polymorphisms in Chinese patients with irritable bowel syndrome.  (abst – 2014)

**RS GENES POLYMORPHISMS – various**

Cannabinoid receptor 1 gene polymorphisms and marijuana misuse interactions on white matter and cognitive deficits in schizophrenia.  (full – 2011)
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3085576/

Variants at the endocannabinoid receptor CB1 gene (CNR1) and insulin sensitivity, type 2 diabetes, and coronary heart disease.  (full – 2011)
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3686489/

Functional polymorphism in the GPR55 gene is associated with anorexia nervosa.

Association study of Cannabinoid receptor 1 (CNR1) gene in tardive dyskinesia

Endocannabinoid type 1 receptor gene (CNR1) polymorphisms (rs806381, rs10485170, rs6454674, rs2023239) and cardiovascular risk factors in postmenopausal women.

Are endocannabinoid type 1 receptor gene (CNR1) polymorphisms associated with obesity and metabolic syndrome in postmenopausal Polish women?  (abst – 2011)

Allele specific differences in the activity of a novel cannabinoid receptor 1(CNR1) gene intronic enhancer in hypothalamus, dorsal root ganglia and hippocampus.  (full – 2012)
http://www.jbc.org/content/early/2012/02/23/jbc.M111.336750.long

Mutation of Cys242 of Human Monoacylglycerol Lipase Disrupts Balanced Hydrolysis of 1- and 2-monoacylglycerols and Selectively Impairs Inhibitor Potency  (full – 2013)
http://molpharm.aspetjournals.org/content/early/2013/12/24/mol.113.090795.long

Testing bidirectional effects between cannabis use and depressive symptoms: moderation by the serotonin transporter gene  (abst – 2013)

New Study: THC May Treat Inflammatory Diseases and Cancer By Altering Genes
(news – 2013)

Mutations found in individuals with autism interfere with endocannabinoid signaling in the brain  (news – 2013)

Mutation of cys242 of human monoacylglycerol lipase disrupts balanced hydrolysis of 1- and 2-monoacylglycerols and selectively impairs inhibitor potency.  (abst – 2014)


Genetic predisposition to schizophrenia associated with increased use of cannabis.

Genetic dissection of the endocannabinoid system and how it changed our knowledge of cannabinoid pharmacology and mammalian physiology  (abst – 2014)
**EPIGENETICS** - genes being turned off, or on, by chemical reactions

Expression and functions of µ-opioid receptors and cannabinoid receptors type 1 in T lymphocytes.  
(abst – 2012)  

Regulation of opioid and cannabinoid receptor genes in human neuroblastoma and T cells by the epigenetic modifiers trichostatin A and 5-aza-2’-deoxycytidine.  
(abst – 2012)  

Reduced expression of brain cannabinoid receptor 1 (Cnr1) is coupled with an increased complementary micro-RNA (miR-26b) in a mouse model of fetal alcohol spectrum disorders.  
(full – 2013)  
[http://www.clinicaepigeneticsjournal.com/content/5/1/14](http://www.clinicaepigeneticsjournal.com/content/5/1/14)

Epigenetic mechanisms and endocannabinoid signaling  
(full – 2013)  

Low 17beta-Estradiol Levels in Cnr1 Knock-Out Mice Affect Spermatid Chromatin Remodeling by Interfering with Chromatin Reorganization.  
(full – 2013)  
[http://www.biolreprod.org/content/88/6/152.long](http://www.biolreprod.org/content/88/6/152.long)

Epigenetics, drugs of abuse, and the retroviral promoter.  
(abst – 2013)  

Epigenetic Control of Skin Differentiation Genes by Phytocannabinoids  
(abst – 2013)  

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**KNOCK-OUT MICE** * – living examples of severely defective endocannabinoid systems.

Are Cannabinoid Receptor Knockout Mice Animal Models for Schizophrenia?  
(abst - 2000)  

Anandamide degradation and N-acylethanolamines level in wild-type and CB1 cannabinoid receptor knockout mice of different ages  
(full – 2001)  

The Central Cannabinoid Receptor Inactivation Suppresses Endocrine Reproductive Functions.  
(abst – 2001)  

Increased Severity of Stroke in CB1 Cannabinoid Receptor Knock-Out Mice  
(full - 2002)


Defective adult neurogenesis in CB1 cannabinoid receptor knockout mice. (full - 2004) http://molpharm.aspetjournals.org/content/66/2/204.long

CB1 cannabinoid receptor knockout in mice leads to leanness, resistance to diet-induced obesity and enhanced leptin sensitivity (full - 2004) http://www.nature.com/ijo/journal/v28/n4/full/0802583a.html


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
Early age-related cognitive impairment in mice lacking cannabinoid CB1 receptors. (full – 2005)  http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1266095/?tool=pubmed

Cannabinoid-receptor 1 null mice are susceptible to neurofilament damage and caspase 3 activation. (abst – 2005)  http://www.ncbi.nlm.nih.gov/pubmed/15953683

Involvement of Neuronal Cannabinoid Receptor CB1 in Regulation of Bone Mass and Bone Remodeling  (full - 2006) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2238031/?tool=pmcentrez


Loss of Cannabinoid Receptor CB1 Induces Preterm Birth  (full - 2008) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2553193/?tool=pmcentrez

The peripheral cannabinoid receptor knockout mice: an update.  (full – 2008) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2219525/?tool=pubmed


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