

GENETICS of the ENDOCANNABINOID SYSTEM– Section under construction

ENDOCANNABINOID SYSTEM GENETICS – ANIMAL also see KNOCK-OUT MICE

Genome-wide microarray analysis identifies a potential role for striatal retrograde endocannabinoid signaling in the pathogenesis of experimental L-DOPA-induced dyskinesia. (abst – 2014) <http://www.ncbi.nlm.nih.gov/pubmed/24599755>

Strain differences in the expression of endocannabinoid genes and in cannabinoid receptor binding in the brain of Lewis and Fischer 344 rats. (abst – 2014) <http://www.ncbi.nlm.nih.gov/pubmed/24607771>

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>

Mutation of Putative GRK Phosphorylation Sites in the Cannabinoid Receptor 1 (CB1R) Confers Resistance to Cannabinoid Tolerance and Hypersensitivity to Cannabinoids in Mice. (abst – 2014) <http://www.ncbi.nlm.nih.gov/pubmed/24719095>

Strain- and context-dependent effects of the anandamide hydrolysis inhibitor URB597 on social behavior in rats (abst – 2014) <http://www.ncbi.nlm.nih.gov/pubmed/24933531>

Genetic dissection of the endocannabinoid system and how it changed our knowledge of cannabinoid pharmacology and mammalian physiology (abst – 2014) <http://onlinelibrary.wiley.com/doi/10.1002/9781118451281.ch4/summary>

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>

Two Novel Mutations in ABHD12: Expansion of the Mutation Spectrum in PHARC and Assessment of Their Functional Effects. (abst – 2013) <http://www.ncbi.nlm.nih.gov/pubmed/24027063>

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) https://www.jstage.jst.go.jp/article/endocrj/58/4/58_K11E-093/_pdf

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)
<http://www.ncbi.nlm.nih.gov/pubmed/18186055>

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)
<http://www.ncbi.nlm.nih.gov/pubmed/23747361>

Association of cannabinoid type 1 receptor and fatty acid amide hydrolase genetic polymorphisms in Chinese patients with irritable bowel syndrome. (abst – 2014)
<http://www.ncbi.nlm.nih.gov/pubmed/24444427>

CB 1 GENES - RS1049353 / G1359 G/A

Association of a CB1 cannabinoid receptor gene (CNR1) polymorphism with severe alcohol dependence. (abst – 2002) <http://www.ncbi.nlm.nih.gov/pubmed/11841893>

Marijuana receptor gene abnormality in schizophrenia (news – 2002)
http://www.eurekalert.org/pub_releases/2002-07/mp-mrg061802.php

Human cannabinoid receptor 1: 5' exons, candidate regulatory regions, polymorphisms, haplotypes and association with polysubstance abuse. (full – 2004)
<http://www.nature.com/mp/journal/v9/n10/full/4001560a.html>

Moderation of the Effect of Adolescent-Onset Cannabis Use on Adult Psychosis by a Functional Polymorphism in the Catechol-O-Methyltransferase Gene: Longitudinal Evidence of a Gene X Environment Interaction (full – 2006)
<http://www.ukcia.org/research/COMTgene.pdf>

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 receptor 1 (CNR1) gene: impact on antidepressant treatment response and emotion processing in major depression. (abst – 2008)
<http://www.ncbi.nlm.nih.gov/pubmed/18579347>

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>

Association of CNR1 and FAAH endocannabinoid gene polymorphisms with anorexia nervosa and bulimia nervosa: evidence for synergistic effects. (full – 2009)
<http://onlinelibrary.wiley.com/doi/10.1111/j.1601-183X.2009.00518.x/full>

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)

<http://www.ncbi.nlm.nih.gov/pubmed/20851297>

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

http://scielo.isciii.es/scielo.php?script=sci_arttext&pid=S0212-16112011000200012&lng=en&nrm=iso

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

<http://www.rjme.ro/RJME/resources/files/520311791795.pdf>

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

<http://www.ncbi.nlm.nih.gov/pubmed/22029183>

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)

<http://www.ncbi.nlm.nih.gov/pubmed/23057570>

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)

<http://www.ncbi.nlm.nih.gov/pubmed/22138970>

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)

<http://www.ncbi.nlm.nih.gov/pubmed/21543209>

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)

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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)

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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)

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Common polymorphism in the cannabinoid type 1 receptor gene (CNR1) is associated with microvascular complications in type 2 diabetes. (abst – 2014)

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CNR1 Gene and Risk of the Metabolic Syndrome in Patients With Schizophrenia.

(abst – 2013) <http://www.ncbi.nlm.nih.gov/pubmed/23422373>

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>

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<http://www.ncbi.nlm.nih.gov/pubmed/24075694>

Role of CNR1 polymorphisms in moderating the effects of psychosocial adversity on impulsivity in adolescents. (abst – 2014)

<http://www.ncbi.nlm.nih.gov/pubmed/24980155>

CB 1 GENES – various polymorphisms

Association study of a cannabinoid receptor gene (CNR1) polymorphism and schizophrenia. (abst – 2000)

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<http://www.nature.com/mp/journal/v9/n10/full/4001560a.html>

Association study of cannabinoid receptor gene (CNR1) alleles and anorexia nervosa: differences between restricting and bingeing/purging subtypes. (abst – 2004)

<http://www.ncbi.nlm.nih.gov/pubmed/14755457>

Depression in Parkinson's disease is related to a genetic polymorphism of the cannabinoid receptor gene (CNR1) (full - 2005)

<http://www.nature.com/tbjournal/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://bjp.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)

<http://www.ncbi.nlm.nih.gov/pubmed/17292652>

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

<http://www.ncbi.nlm.nih.gov/pubmed/19539700>

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

http://www.eurekalert.org/pub_releases/2009-12/ace-tua121209.php

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)

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3013130/?tool=pubmed>

Polymorphisms in the endocannabinoid receptor 1 in relation to fat mass distribution

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<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)

<http://onlinelibrary.wiley.com/doi/10.1111/j.1476-5381.2011.01744.x/pdf>

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) <http://www.mdpi.com/1424-8247/4/8/1101>

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) <http://onlinelibrary.wiley.com/enhanced/doi/10.1111/j.1476-5381.2012.02175.x/>

Randomized pharmacodynamic and pharmacogenetic trial of dronabinol effects on colon transit in irritable bowel syndrome-diarrhea. (full – 2012)
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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) <http://www.ncbi.nlm.nih.gov/pubmed/23057570>

The genetic basis of the endocannabinoid system and drug addiction in humans (abst – 2012) <http://www.ncbi.nlm.nih.gov/pubmed/21937688>

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) <http://phys.org/news/2012-08-cannabis-receptor-discovery-obesity-pain.html>

Molecular basis for dramatic changes in cannabinoid CB1 G protein-coupled receptor activation upon single and double point mutations. (full - 2013)
<http://onlinelibrary.wiley.com/doi/10.1002/pro.2192/full>

Activation-dependent plasticity of polarized GPCR distribution on the neuronal surface. (full – 2013) <http://jmcboxfordjournals.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)

<http://www.sciencedirect.com/science/article/pii/S0896627313003619>

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

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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)

<http://www.ncbi.nlm.nih.gov/pubmed/23408552>

Interrogating Therapeutic Manipulation of the Endocannabinoid System in Human Colon (abst – 2013)

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

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

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<http://www.ncbi.nlm.nih.gov/pubmed/24172113>

A Link Between Autism and Cannabinoids (news – 2013)

<http://www.the-scientist.com/?articles.view/articleNo/35088/title/A-Link-Between-Autism-and-Cannabinoids/>

Genetic Variations in the Human Cannabinoid Receptor Gene Are Associated with Happiness (full – 2014)

<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0093771>

Endocannabinoid Receptors Gene Expression in Morbidly Obese Women with Nonalcoholic Fatty Liver Disease (full – 2014)

<http://www.hindawi.com/journals/bmri/2014/502542/>

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

<http://www.ncbi.nlm.nih.gov/pubmed/25014618>

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>

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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>

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.

(abst – 2010) <http://www.ncbi.nlm.nih.gov/pubmed/19768813>

CNR2 functional variant (Q63R) influences childhood immune thrombocytopenic purpura. (full – 2011)

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3232275/>

Genetic association between bipolar disorder and 524A>C (Leu133Ile) polymorphism of CNR2 gene, encoding for CB2 cannabinoid receptor. (abst - 2011)

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Cannabinoid receptor type 2 functional variant influences liver damage in children with non-alcoholic Fatty liver disease. (full – 2012)

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

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COMT GENES

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http://www.medwirenews.com/47/71003/Psychiatry/Cannabis_and_smoking_gene_links_to_schizophrenia_%E2%80%98unfounded%E2%80%99.html

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<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/>

Psychosis-inducing effects of cannabis are related to both childhood abuse and COMT genotypes. (full – 2013) <http://onlinelibrary.wiley.com/doi/10.1111/acps.12108/full>

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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

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