

*Developing an Online Encyclopedia
on Genetic Variation and Human Health
Food for Thought!*

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CDC National Office of Public Health Genomics




What is a Field Synopsis?


- A regularly updated snapshot of “what we know and what we don’t know” about the association of a particular field (disease or group of conditions) with human genetic variation
- Some desirable features of field synopses
 - Systematic (published/unpublished)
 - Accessible online
 - Updated
 - Authoritative
 - Cumulative quantitative assessment
 - Grading of evidence
 - Linkage with other data/information

What is an Online Encyclopedia?


- Collection of field synopses but different models exist
- Is it impossible to do in the field of genomics given rapidly changing information?
- A proposal for a collaborative approach

Models for Online Encyclopedia 1


Address  <http://www.ncbi.nlm.nih.gov/entrez/dispomim.cgi?id=219700>  Go  Links >>



MIM #219700
Description
Clinical Features
Inheritance
Cytogenetics
Mapping
Molecular Genetics
Heterogeneity
Pathogenesis
Diagnosis
Clinical Management
Population Genetics
Evolution
Genetic Variability
Animal Model
History
See Also
References
Contributors
Creation Date
Edit History



Online Mendelian Inheritance in Man




Johns Hopkins University

All Databases PubMed Nucleotide Protein Genome Structure PMC Taxonomy OMIM

Search for

Display Show

All: 1 

[#219700](#) GeneTests, Links

CYSTIC FIBROSIS; CF

Alternative titles; symbols

MUCOVISCIDOSIS

Gene map locus [7q31.2](#)

TEXT

Models for Online Encyclopedia 2

Address  <http://www.genetests.org/servlet/access?db=geneclinics&site=gt&id=8888891&key=eeT7kUdx42arK&gry=&fcn=y&fw=cMYXE>  [Links](#)

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CFTR-Related Disorders

[Summary](#)
[Diagnosis](#)
[Clinical Description](#)
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[Management](#)
[Genetic Counseling](#)
[Molecular Genetics](#)
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CFTR-Related Disorders

[Includes: Cystic Fibrosis (CF, Mucoviscidosis) and Congenital Bilateral Absence of the Vas Deferens (CBAVD)]

Authors: Samuel M Moskowitz, MD
Ronald L Gibson, MD, PhD
Darci L Sternen, MS, CGC
Edith Cheng, MS, MD
Garry R Cutting, MD

[About the Authors / Author History](#)

Initial Posting:
26 March 2001

Last Revision:
24 August 2005

[Disable Glossary](#)
(Returns to top)

Click on [defined terms](#); definition displays here.

Models for Online Encyclopedia 3



PharmGKB

The Pharmacogenetics and Pharmacogenomics Knowledge Base

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PharmGKB curates information that establishes knowledge about the relationships among drugs, diseases and genes, including their variations and gene products. Our mission is to catalyze pharmacogenomics research.

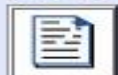
Browse PharmGKB

variant genes



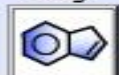
608

literature



2,193

drugs



529

pathways



43

diseases



518

phenotypes



124

annotated PGx genes



26

Search PharmGKB: ?

Go

e.g. a gene ("ABCB1"), drug ("irinotecan") or disease ("neoplasm")

What's New?

- [Anti-diabetic drug pathway](#)
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Curators' Favorite Papers

No papers of interest selected

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Models for Online Encyclopedia 4



Human Variome Project · Home



THE HUMAN VARIOME PROJECT
International Collection of Human Gene Variation

Home Background Objectives Project Info 2006 Meeting News Links Contact

PLANNING MEETING


A Planning Meeting will be held 25-29 May 2008 in San Feliu de Guixols Spain. This runs just prior to the European Society of Human Genetics annual meeting in Barcelona nearby. Check the meeting website for more details (www.humanvariomeproject.org/HVP2008). All those interested and able to contribute are invited to register.

A global initiative that will catalogue all human gene variations – and will make that information freely available to researchers, clinicians and patients everywhere.

The Human Variome Project will bring the fruits of the Human Genome Project to impact upon healthcare and create a global resource for those affected by a Genetic Disorder

Models for Online Encyclopedia 5

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The Free Encyclopedia

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Today's featured article

 **Kochi** is a city in the Indian state of Kerala, and one of the principal seaports of the country. Kochi is located in the district of Ernakulam, about 220 km north of the state capital Thiruvananthapuram. The city has an estimated population of 650,000, with an extended metropolitan population of over 1.6 million, making it the largest urban agglomeration and the second largest city in Kerala. Since 1498, it has been a major port of call for ships from Europe, Africa, and the East Indies.

In the news

- The World Confederation of Labour and the International Confederation of Free Trade Unions merge to form the **International Trade Union Confederation**, representing 166 million members.
- Hassan Nasrallah, the Secretary General of Hezbollah, says negotiations



Collaborative Approach Needed

- **Investigators/networks/consortia/GWAS/biobanks**
- **Systematic reviewers:** conduct field synopses and write knowledge base summaries
- **Methods developers:** tools and resources
- **Publishers:** journal editors, NCBI-connecting text and databases

Networks/Investigators

Data producers,
publications,
disease specific databases

Networks/Investigators

Data producers,
publications,
disease specific databases

Systematic Reviewers

Appraisal, field synopses,
encyclopedia entries,
updates



NLM/Online Publishers

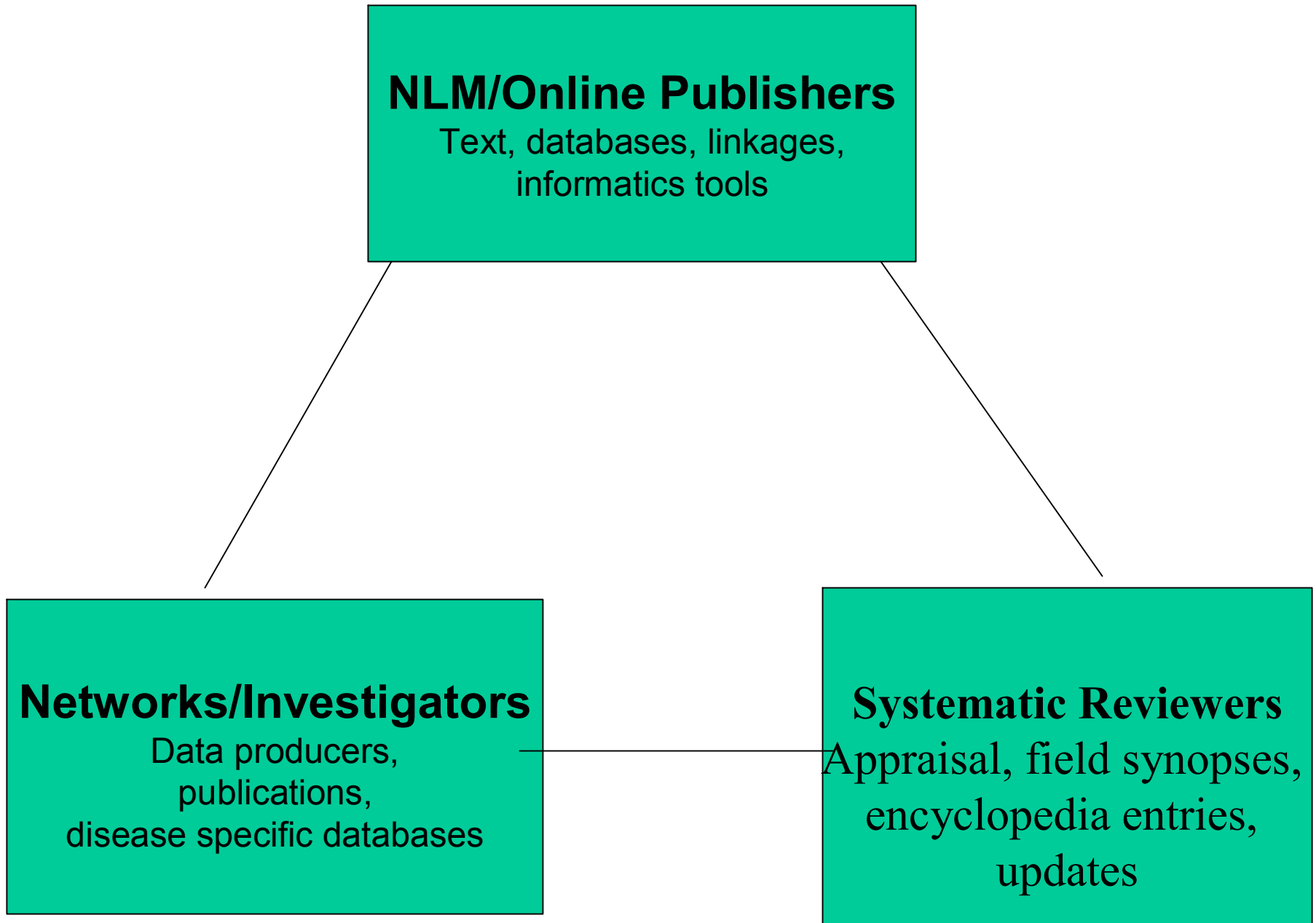
Text, databases, linkages,
informatics tools

Networks/Investigators

Data producers,
publications,
disease specific databases

Systematic Reviewers

Appraisal, field synopses,
encyclopedia entries,
updates



NLM/Online Publishers

Text, databases, linkages,
informatics tools

HuGENet

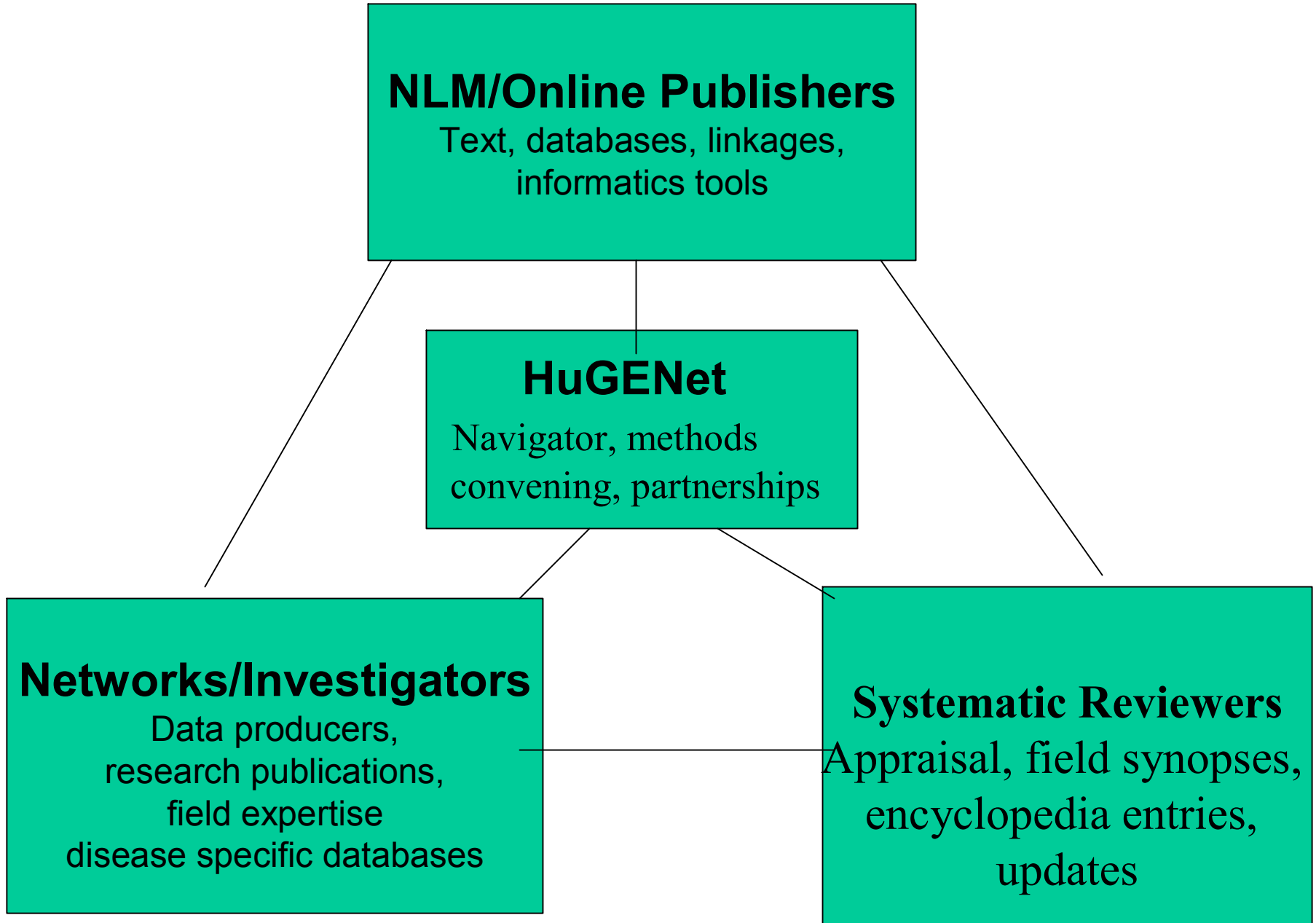
Navigator, methods
convening, partnerships

Networks/Investigators

Data producers,
research publications,
field expertise
disease specific databases

Systematic Reviewers

Appraisal, field synopses,
encyclopedia entries,
updates





HuGE Navigator (version 1.0)

An integrated, searchable knowledge base of genetic associations and human genome epidemiology.

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HuGEPedia

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Search for Disease Gene

- Select options, Disease or Gene.
- Enter one disease term or gene information (gene symbol, alias names etc) into the text box.
- Click All to see A-Z list of diseases or genes.
- Use the Search dropdown list to switch to other HuGE Navigator applications.

HuGEPedia is an online Human Genome Epidemiology (HuGE) encyclopedia that allows users search integrated information on genetic associations and other HuGE information including the published HuGE literature, HuGE investigators, candidate genes, association data extracted from meta-analysis publications and HuGE field synopses generated by domain experts, as well as analysis of temporal and geographic trends.

How to cite this site:



HuGE Navigator (version 1.0)

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HuGEPedia

Search for Disease Gene

Alzheimer Disease

Summary

299 genes have been studied in association with Alzheimer Disease

Total Publications

[1157](#)

Meta-Analyses

[43](#)

MA Summary

Genes

299

GWAS Publications

[6](#)

Investigators

[1356\(F/L\)](#)

[4661\(All\)](#)

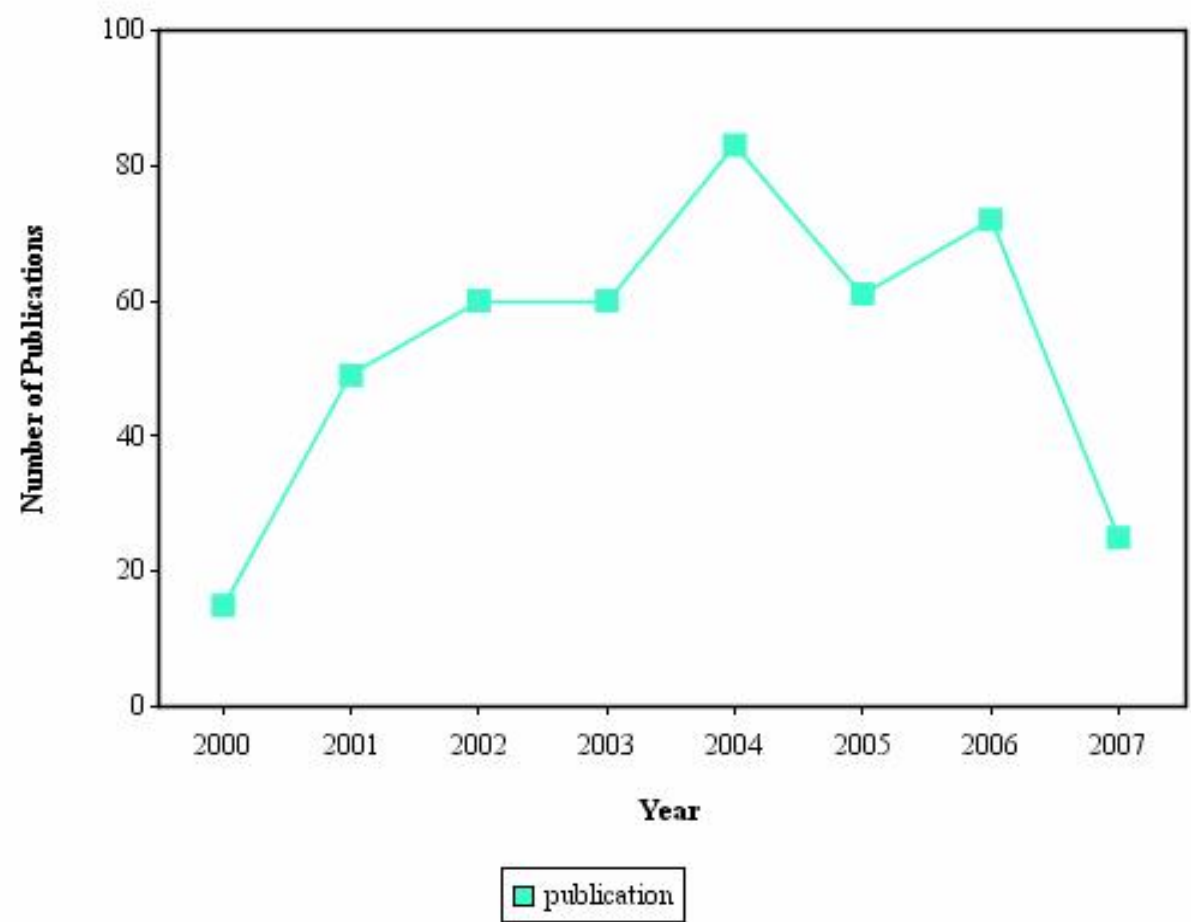
Trend/Pattern



Last Update: 27 Dec 2007

[Click to re-sort the table]

<input type="checkbox"/> Gene	<input type="checkbox"/> Total Pub	<input type="checkbox"/> MA Pub (<input type="checkbox"/> Summary)	<input type="checkbox"/> Trend/Pattern
APOE	589	20	
ACE	34	5	
PSEN1	32	3	
A2M	29	1	
IL1A	29	1	
IL1B	23	0	
BDNF	23	0	
MTHFR	23	1	
BCHE	22	1	
CYP46A1	21	1	
MAPT	19	1	
SLC6A4	18	0	
TNF	18	1	



Note: The chart illustrates the temporal trend based on Medline/PubMed records indexed with the disease MeSH term (Alzheimer's Disease). Un-MeSHed PubMed records are not included.

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HuGEPedia

Search for Disease Gene

Alzheimer Disease


Summary

299 genes have been studied in association with Alzheimer Disease


- Total Publications [1157](#)
- Meta-Analyses [43](#)
- MA Summary
- Genes 299
- GWAS Publications [6](#)
- Investigators [1356\(F/L\)](#)
[4661\(All\)](#)
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MAPT	19	1	
SLC6A4	18	0	
TNF	18	1	































 Trend/Pattern

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Field Synopsis by [Bertram et al.](#)NCBI Entry [Alzheimer](#)GWAS Database 

NA

Disease Site [AlzGene](#)

CYP46A1	21	1	
MAPT	19	1	
SLC6A4	18	0	
TNF	18	1	
CTSD	18	1	
IL6	17	0	
LRP1	15	3	
PON1	14	0	
IDE	14	1	
CST3	14	1	
ESR1	14	2	
APP	13	0	
PRNP	13	5 	
PSEN2	13	0	
IL10	12	0	
SERPINA3	12	1	
LDLR	11	1	
HFE	11	0	
NOS3	11	1	
CHAT	10	0	
ABCA1	10	0	
BACE1	10	2	
COMT	9	0	
HTR2A	9	0	
TF	9	1	
TGFB1	8	0	
MPO	8	2	
NCSTN	8	1	
APOC1	7	0	
IL1RN	7	0	
UBQLN1	7	0	

1: Nat Genet. 2007 Jan;39(1):17-23. Related Articles, Links



Systematic meta-analyses of Alzheimer disease genetic association studies: the AlzGene database.

Bertram L, McQueen MB, Mullin K, Blacker D, Tanzi RE.

Genetics and Aging Research Unit, MassGeneral Institute for Neurodegenerative Disease (MIND), Department of Neurology, Massachusetts General Hospital, Charlestown, Massachusetts 02129, USA. bertram@helix.mgh.harvard.edu

Trend/Pattern



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NCBI Entry

[Alzheimer](#)

GWAS Database

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[AlzGene](#)

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IF	9	1	
TGFB1	8	0	
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ALZGENE - PUBLISHED AD CANDIDATE GENES

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Updated 31 August 2007

Chromosome: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 X Y

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- CHRNA2
- CH25H
- PGBD1

Trend/Pattern



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HuGEPedia

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Search for

 Disease Gene

Meta Table for Alzheimer Disease and PRNP

Variant: codon 129

Gene(s): ([PRNP](#))


Phenotype	Reference	Analysis Type*	#Studies	#Cases	#Controls	Contrast	Effect size*	Het*
Alzheimer's disease	Qian HR, 2006	A	4	1095	940	(MM + VV) vs. MV	1.100 (0.890-1.350)	none found
Alzheimer's disease	Qian HR, 2006	A	Not Reported	Not Reported	Not Reported	V* vs MM	0.800 (0.650-0.980)	none found
Alzheimer's disease	Qian HR, 2006	A	Not Reported	Not Reported	Not Reported	M* vs VV	1.380 (1.010-1.890)	none found

A: Meta analysis of group level data (and/or HuGE review)

B: Consortium-based analysis with individual level data

Effect Size: OR unless noted otherwise

Het: Heterogeneity

































Trend/Pattern
 

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NA

Disease Site [AlzGene](#)

CYP46A1	21	1	
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ABCA1	10	0	
BACE1	10	2	
COMT	9	0	
HTR2A	9	0	
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IL1RN	7	0	
UBQLN1	7	0	

Genes and Disease



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Adrenoleukodystrophy

→ Alzheimer disease

Amyotrophic lateral sclerosis

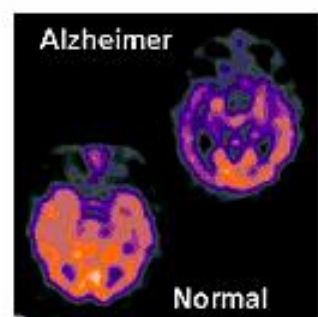
Angelman syndrome

Ataxia telangiectasia

Charcot-Marie-Tooth syndrome

Alzheimer disease

Alzheimer disease (AD) is the fourth leading cause of death in adults. The incidence of the disease rises steeply with age. AD is twice



Brain scans of a healthy elderly person and a patient with Alzheimer's disease. [Image supplied Keith Johnson, Brigham

Did you know ...?


Gene sequence

[Genome view](#) see gene locations


[Entrez Gene](#) collection of gene-related information

[BLink](#) related sequences in different organisms

The literature































 Trend/Pattern

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Field Synopsis 
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UBQLN1	7	0	



Linking Genome-Wide Association Study of Schizophrenia

Accession: phs000021.v1.p1

Description

The goal of the study is to find susceptibility genes for schizophrenia.

Note: The data for this study have not been completely submitted and processed into the dbGaP database yet. Public summaries of phenotype variables as well as encoded study documents are coming soon. Thank you for your patience.

[GAIN The Genetic Association Information Network](#)

- Participants: 5188
- Type: Case-control


Individual-Level Data

- [Request to Download Individual-Level Data from dbGaP Authorized Access](#)
- [Data Use Certification Requirements \(DUC\)](#)
- Release Date for Individual-Level Data: December 25, 2007
- Embargo Release Date: August 25, 2008

- **Use Restrictions**

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Search for:

































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Disease Site [AlzGene](#)

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Summary

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- Meta-Analyses [43](#)
- MA Summary

--
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- GWAS Publications [6](#)
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[4661\(All\)](#)
- Trend/Pattern

[Click to re-sort the table]

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NLM/Online Publishers

Text, databases, linkages,
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