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**BIOETHICS THESAURUS FOR GENETICS  
Alphabetical List of Keyword Descriptors  
and Genetics Tree**

**2010**

**Appendix:  
Examples of Genetics-Related Keyword Identifiers**

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## BIOETHICS THESAURUS FOR GENETICS 2010

### Introduction: Keyword Indexing of the GenETHX Database

With financial support from the National Human Genome Research Institute, the Bibliographers at the Bioethics Research Library at Georgetown University have updated and enriched the *Bioethics Thesaurus* with genetics terminology. In May 2007 they began indexing documents in the GenETHX database with these terms.

The 2010 *Bioethics Thesaurus for Genetics* contains 108 Keyword Descriptors (subject terms in a controlled indexing vocabulary) related to genetics. Ten of these terms are new to the 2010 Thesaurus. Some of the terms (e.g., CLINICAL GENETICS, GENETIC ANCESTRY, GENETIC DISCRIMINATION, GENETIC EPIDEMIOLOGY, GENETIC RELATEDNESS TIES, GENETIC RESOURCES, HUMAN GENOME DIVERSITY PROJECT, PERSONAL GENOMICS, and SYNTHETIC BIOLOGY) are, as far as we know, unique to any Thesaurus descriptor vocabulary.

All of the Keyword Descriptors in the Bioethics Thesaurus for Genetics have been annotated with the date they were introduced (DT), with explanatory Scope Notes (SN), and with Broader Term (BT), Narrower Term (NT), and Related Term (RT) cross-references to other Thesaurus terms, some in subject areas other than genetics. (Following Thesaurus convention, “+” after a Narrower or Related Term indicates that the term cited has more specific Narrower Terms under it.)

The Classification field (CL) indicates what number, or combination of numbers, from the Bioethics Research Library’s Classification Scheme would have been assigned to the document. (“+” after a number indicates that a searcher might find any number starting with 15. that appears on the Classification Scheme.)

The alphabetical list of Keyword Descriptors in the 2010 *Bioethics Thesaurus for Genetics* is followed by an updated “Genetics Tree,” which provides an easy-to-grasp three-page overview of the genetics terms in a hierarchical display. Searchers interested in a set of broader and narrower terms should “OR” the relevant terms together in a search strategy statement.

An appendix to this Thesaurus provides examples of genetics-related Keyword Identifiers (KWIs) that are not part of the controlled vocabulary of the *Bioethics Thesaurus*. They include the names of persons, corporate bodies, laws, court decisions, and geographic names.

So far, more than 3,850 documents in the GenETHX database have been indexed with Keyword Descriptors from the *Bioethics Thesaurus* and, as appropriate, with non-Thesaurus Keyword Identifiers, and Keyword Proposed Descriptors (terms under consideration for inclusion in future editions of the *Bioethics Thesaurus*). They have also been indexed with many non-genetics related Keywords from the full *Bioethics Thesaurus*.

The comprehensive *Bioethics Thesaurus* is available on the Web at <http://bioethics.georgetown.edu/databases/bt/>.

Search tips geared to searching the GenETHX database are available on the Web at <http://bioethics.georgetown.edu/databases/GenETHX/genetips/index.html>.

## KEYWORD DESCRIPTORS IN THE 2010 BIOETHICS THESAURUS FOR GENETICS

### ADULT STEM CELLS

- DT 2007  
SN Undifferentiated cells found in a differentiated tissue that can renew themselves and differentiate (with certain limitations) to give rise to more specialized cells  
BT Stem cells  
RT Induced pluripotent stem cells  
CL 18.7

### ALTERED NUCLEAR TRANSFER

- DT 2010  
SN A proposed technological approach to obtain human pluripotent stem cells, which are the functional equivalent of human embryonic stem cells, without creating or destroying human embryos (ANT website, accessed 1/26/10). The process was originally proposed by William B. Hurlbut  
BT Nuclear transfer techniques  
RT Induced pluripotent stem cells  
CL 18.7 and 15.1

### ANIMAL CLONING

- DT 2007 (was CLONING, 1974-2001)  
SN Asexual single-parent reproduction of an animal, in which the offspring has DNA in the cell nucleus that is identical to the nuclear DNA of its parent  
BT Cloning  
CL 14.5 and 22.3

### APO-E GENES

- DT 2009  
SN Genes that provide instructions for making a protein called apolipoprotein E which carries cholesterol and other fats through the blood to be processed. Some variations of the APO-E gene are associated with a genetic predisposition to disorders such as Alzheimer disease  
UF apoE genes  
apolipoprotein genes  
BT Genes  
CL 15.+

### BEHAVIORAL GENETICS

- DT 1974  
SN The study of the effects of heredity on human behavior  
BT Genetics  
NT Genetic determinism  
RT Psychiatric genetics  
Sociobiology  
XYY karyotype  
CL 15.6

### BIOTECHNOLOGY

- DT 2008  
SN The manipulation (as through genetic engineering) of living organisms or their components to produce useful, usually commercial, products (as pest resistant crops, new

bacterial strains, or novel pharmaceuticals; also, any of various applications of biological science used in such manipulation (Merriam-Webster Online Dictionary, accessed 1/17/08)

BT Genetic engineering  
Technology  
NT Synthetic biology  
CL 15.+

### **BRCA1 GENES**

DT 2008  
SN Tumor suppressor genes, located on human chromosome 17, mutations of which are associated with a higher than average incidence of breast and ovarian cancer  
BT Genes  
CL 15.+

### **BRCA2 GENES**

DT 2008  
SN Tumor suppressor genes, located on human chromosome 13, mutations of which are associated with a higher than average incidence of breast and ovarian cancer  
BT Genes  
CL 15.+

### **CANAVAN DISEASE**

DT 2010  
SN An inherited disorder that causes progressive damage to nerve cells in the brain (Genetics Home Reference, accessed 1/20/10)  
BT Central nervous system diseases  
Genetic disorders  
CL 15.+

### **CHIMERAS**

DT 2007 (was HYBRIDS, 1974-2001)  
SN The offspring of parents belonging to different species, varieties, or genotypes  
UF Hybrids  
BT Genetic engineering  
CL 15.1 and 22.1

### **CHROMOSOME ABNORMALITIES**

DT 1974  
SN Defects in the structure of number of chromosomes resulting in structural aberrations or manifesting as disease (Online Medical Dictionary, accessed 11/25/08)  
UF Aneuploidy  
BT Congenital disorders  
Genetic disorders  
NT Fragile X syndrome  
Klinefelter syndrome  
Trisomy+  
Turner syndrome  
XYY karyotype  
CL 15.+

### **CLINICAL GENETICS**

DT 2007  
SN Genetics applied to the diagnosis, prognosis, management, and prevention of genetic

diseases (Stedman's Online Medical Dictionary, 2007)  
 UF Medical genetics  
 BT Genetics  
 NT Gene therapy  
 Genetic counseling  
 Genetic services  
 Genetic testing  
 Preimplantation diagnosis  
 Prenatal diagnosis+  
 RT Genetic intervention+  
 CL 15.2 or 15.3 or 15.4

### **CLONING**

DT 1974  
 SN Asexual single-parent reproduction, in which an offspring has DNA in the cell nucleus that is identical to the nuclear DNA of its parent  
 UF Human cloning  
 Embryo cloning (use CLONING and (EMBRYOS or EMBRYO RESEARCH+))  
 Reproductive cloning (use CLONING and REPRODUCTIVE TECHNOLOGIES)  
 Research cloning (use CLONING and EMBRYO RESEARCH+)  
 Therapeutic cloning (use CLONING and (STEM CELLS+ or STEM CELL TRANSPLANTATION))  
 BT Genetic techniques  
 Reproductive technologies  
 NT Animal cloning  
 RT Nuclear transfer techniques+  
 CL 14.5

### **CYSTIC FIBROSIS**

DT 1981  
 SN An autosomal recessive genetic disease of the exocrine glands (MeSH, truncated)  
 BT Genetic disorders  
 CL 15.+

### **DNA**

DT 2007 (was GENETIC MATERIALS, 1997-2001)  
 SN A nucleic acid that is the primary genetic material of all cells  
 UF Deoxyribonucleic acid  
 BT Genetic materials  
 RT DNA sequences  
 CL 15.1 or 15.8

### **DNA FINGERPRINTING**

DT 1991  
 SN A genetic identification procedure in which band patterns of DNA (the DNA fingerprint) from one individual or an unknown individual are evaluated for similarities with those of a known individual  
 BT Forensic genetics  
 Genetic techniques  
 RT Genetic databases  
 Genetic testing  
 CL 15.1 and 1.3.5

## **DNA SEQUENCES**

- DT 1997  
SN Base pairs arranged in linear order, whether in a stretch of DNA, a gene, a chromosome, or an entire genome  
UF Base sequence  
BT Genetic materials  
RT DNA  
Genes+  
Genome+  
CL 15.1 or 15.8

## **DOWN SYNDROME**

- DT 1974  
UF Down's syndrome  
Mongolism  
Trisomy 21  
SN A chromosome disorder associated either with an extra chromosome 21 or an effective trisomy for chromosome 21 (MeSH, truncated)  
BT Trisomy  
RT Mentally retarded persons  
CL 9.5.3 (often and 15.2)

## **DUCHENNE MUSCULAR DYSTROPHY**

- DT 1974  
UF Dystrophy, Duchenne muscular  
Muscular dystrophy, Duchenne  
SN One of nine types of muscular dystrophy, a group of genetic, degenerative diseases primarily affecting voluntary muscles (Muscular Dystrophy Association website, accessed 12/4/08)  
BT Genetic disorders  
CL 15.+

## **EMBRYONIC STEM CELLS**

- DT 2007  
SN Primitive (undifferentiated) cells derived from a 5-day blastocyst that have the potential to become a wide variety of specialized cell types  
BT Stem cells  
CL 18.7

## **EPIGENETICS**

- DT 2008 kwds  
SN Heritable changes in phenotype (appearance) or gene expression that are caused by mechanisms other than changes in the underlying DNA sequence (Wikipedia)  
BT Genetic phenomena  
CL 15.+

## **EUGENICS**

- DT 1974  
SN The study of or belief in the possibility of improving the qualities of the human species or a human population, esp. by such means as discouraging reproduction by persons having genetic defects or presumed to have inheritable undesirable traits (negative eugenics) or encouraging reproduction by persons presumed to have inheritable desirable traits (positive eugenics) (based on the Random House Unabridged Dictionary, 2006)

UF Negative eugenics  
Positive eugenics  
BT Genetic intervention  
RT Genetic enhancement  
CL 15.5

### **EVOLUTION**

DT 1974  
UF Natural selection  
SN The process of cumulative change over successive generations through which organisms acquire their distinguishing morphological and physiological characteristics (MeSH)  
BT Genetic phenomena  
RT Sociobiology  
CL 15.1 and/or 3.2

### **FORENSIC GENETICS**

DT 2008  
SN The branch of genetics that deals with the application of genetic knowledge to legal problems and legal proceedings, often referring specifically to matching DNA from a suspect in a crime to samples taken from a crime scene  
BT Forensic medicine  
Genetics  
NT DNA fingerprinting  
RT Law enforcement  
CL 15.1 and 1.3.5

### **FRAGILE X SYNDROME**

DT 2008  
SN A genetic disorder caused by a mutation of the FMR1 gene on the X chromosome. It is associated with a range of developmental problems, including cognitive or intellectual disabilities  
BT Chromosome abnormalities  
RT Mental retardation  
CL 15.+

### **GAUCHER DISEASE**

DT 2009; *was* GENETIC DISORDERS, 1974-2001  
SN A rare genetic disorder that results in the accumulation of fatty molecules called cerebrosides  
BT Genetic disorders  
CL 15.+

### **GENE POOL**

DT 1974  
SN The complete assortment of genes present in the gametes of the members of a population that are eligible to reproduce (Encyclopedia of Genetics, 2004)  
BT Genetic phenomena  
RT Population genetics+  
CL 15.+

### **GENE THERAPY**

DT 1980  
SN The treatment of genetic disorders through the introduction of properly functioning genes into the appropriate cells of an organism

UF Germline gene therapy (use GENE THERAPY and GERM CELLS)  
Somatic gene therapy  
BT Clinical genetics  
Genetic engineering  
RT Gene transfer techniques  
Genetic enhancement  
Genetic services  
CL 15.4

### **GENE TRANSFER TECHNIQUES**

DT 2007  
SN Methods of introducing genes into an organism's cells, usually by a vector such as a modified virus  
BT Genetic techniques  
RT Gene therapy  
Genetic enhancement  
CL 15.+

### **GENES**

DT 1997  
SN Functional and physical units of heredity passed from parent to offspring. Genes are pieces of DNA, and most genes contain the information for making a specific protein (National Human Genome Research Institute Talking Glossary, 2007)  
BT Genetic materials  
NT APO-E genes  
BRCA1 genes  
BRCA2 genes  
Transgenes  
RT DNA sequences  
CL 15.1 or 15.8

### **GENETIC ANCESTRY**

DT 2007  
SN Relationship to continental population groups through one's forebears  
BT Population genetics  
RT Pedigree  
Pharmacogenetics  
Racial groups+  
CL 15.11

### **GENETIC ASSOCIATION STUDIES**

DT 2010  
SN The analysis of a sequence such as a region of a chromosome, a haplotype, a gene, or an allele for its involvement in controlling the phenotype of a specific trait, metabolic pathway, or disease (MeSH)  
BT Genetic techniques  
NT Genome-wide association studies  
CL 15.1

### **GENETIC CARRIERS**

DT 2007 (was CARRIERS, 1974-2001)  
SN Individuals possessing a specified gene who are capable of transmitting it to offspring but who do not show its typical expression  
UF Carriers

BT Genotype  
RT Genetic disorders+  
CL 15.2 or 15.3

### **GENETIC COUNSELING**

DT 1974  
SN The process whereby an expert in genetic disorders provides information about risk and clinical burden of a disorder or disorders to patients or relatives in families with genetic disorders as an aid to making informed and responsible decisions about marriage, children, early diagnosis, and prognosis (Stedman's Online Medical Dictionary, 2007)  
BT Counseling  
Clinical genetics  
Genetic intervention  
RT Directive counseling  
Genetic information+  
Genetic services  
Genetic testing  
Prenatal diagnosis+  
CL 15.2

### **GENETIC DATABASES**

DT 2007 (was DNA DATA BANKS, 1994-2001)  
SN Collections of genetic information that are maintained for clinical, research, or law enforcement purposes  
UF DNA data banks  
DNA databases  
BT Databases  
Genetic information  
RT Biological specimen banks+  
DNA fingerprinting  
Genetic privacy  
Genetic research+  
CL 15.1 and 1.3.12

### **GENETIC DETERMINISM**

DT 1998  
SN The theory that human character and behavior are determined solely or predominantly by the genes that comprise the individual's genotype, rather than shaped by genotype plus culture, social environment, and individual choice; also used for discussions of the degree to which genes determine physical phenotypes  
UF Genetic reductionism  
BT Behavioral genetics  
Genetic phenomena  
CL 15.6

### **GENETIC DISCRIMINATION**

DT 2007 (was SOCIAL DISCRIMINATION, 1982-2001, or INSURANCE SELECTION BIAS, 1998-2001)  
SN Unfair treatment of a person or group based on genetic information, which may be used, e.g., to deny or limit insurance or employment  
BT Psychosocial genetics  
Social discrimination  
CL 15.+ and (8.4 or 9.3.1 or occasionally 16.3)

## GENETIC DISORDERS

- DT 1974  
SN Pathological conditions caused by an absent or defective gene or by a chromosome aberration (American Heritage Dictionary of the English Language, 4<sup>th</sup> ed, 2000)  
UF Genetic diseases, inborn  
Hereditary diseases  
Inborn genetic diseases  
Inherited disorders  
BT Genetics  
NT Canavan disease  
Chromosome abnormalities+  
Cystic fibrosis  
Duchenne muscular dystrophy  
Hemoglobinopathies+  
Hemophilia  
Late-onset disorders+  
Phenylketonuria  
Tay Sachs disease  
*Note: consult the MeSH vocabulary (under Genetic Diseases, Inborn) for additional genetic disorders*  
RT Genetic carriers  
Genetic predisposition  
Growth disorders  
Neural tube defects+  
CL 15.+

## GENETIC DIVERSITY

- DT 1998  
SN Genotypic differences among individuals and among population groups  
UF Genetic variation  
Variation, genetic  
BT Genetic phenomena  
RT HapMap Project  
Human Genome Diversity Project  
Population genetics+  
CL 15.+

## GENETIC ENGINEERING

- DT 1974 (was GENETIC INTERVENTION, 1974-2001)  
SN Directed modification of the gene complement of a living organism by such techniques as altering the DNA, substituting genetic material by means of a virus, transplanting whole nuclei, transplanting cell hybrids, etc. (MeSH)  
BT Bioengineering  
Genetic intervention  
NT Biotechnology+  
Chimeras  
Gene therapy  
Genetic enhancement  
Genetically modified food  
Genetically modified organisms+  
Recombinant DNA research  
RT Containment (*of biohazards*)  
Genetic Techniques+

CL 15.1 (or 15.7 for biohazards of genetic research)

### **GENETIC ENHANCEMENT**

DT 1996 (was GENE THERAPY or GENETIC INTERVENTION, 1974-1995)  
SN The use of genetic technologies to augment or improve human or animal capacities or traits, rather than to treat disease  
BT Enhancement technologies  
Genetic engineering  
RT Eugenics  
Gene therapy  
Gene transfer techniques  
CL 15.+ and 4.5

### **GENETIC EPIDEMIOLOGY**

DT 2008  
SN The study of genetics as a phenomenon of defined populations by the criteria, methods, and objectives of epidemiology rather than of population genetics (Online Medical Dictionary, accessed 1/17/08)  
EN Epidemiological genetics  
BT Epidemiology  
Genetics  
RT Genetic research+  
Population genetics+  
CL 15.+

### **GENETIC IDENTITY**

DT 1998  
SN Personal identity as it is based on the individual's genotype  
BT Psychosocial genetics  
RT Self concept  
CL 15.+

### **GENETIC INFORMATION**

DT 1997  
SN Genetic data, about an individual, family, or population group, derived from genetic research, tests, or family histories  
BT Genetics  
NT Genetic databases  
Genetic privacy  
Pedigree  
RT Genetic counseling  
Genetic research+  
Genetic testing  
Incidental findings  
CL 15.+

### **GENETIC INTERVENTION**

DT 1974  
SN General term for the modification of inheritable characteristics of individuals or populations through various social mechanisms and/or genetic technologies  
BT Genetics  
NT Eugenics  
Genetic counseling  
Genetic engineering+

Genetic testing  
Preimplantation diagnosis  
Prenatal diagnosis+  
RT Clinical genetics+  
Genetic research+  
Sex determination  
Sex preselection  
CL 15.+

### **GENETIC MARKERS**

DT 2007  
SN Specific DNA sequences that are associated with the variability of a genetic disorder or trait and that can potentially be used to determine the locus of the gene or genes associated with that trait or disorder  
BT Genetic phenomena  
CL 15.+

### **GENETIC MATERIALS**

DT 1997  
SN DNA and biological entities from which DNA can be extracted  
BT Genetics  
NT DNA  
DNA sequences  
Genes+  
Genetic resources  
Genome+  
RT Genetic patents  
CL 15.+

### **GENETIC PATENTS**

DT 2007 (was PATENTS, 1974-2001)  
SN Patents on life forms or genetic materials  
UF Biopatents  
BT Genetic research  
Patents  
RT Genetic materials+  
CL 15.8

### **GENETIC PHENOMENA**

DT 2007  
SN Concepts related to genetic processes and structures  
BT Genetics  
NT Epigenetics  
Evolution  
Gene pool  
Genetic determinism  
Genetic diversity  
Genetic markers  
Genotype+  
Mutation  
Nuclear reprogramming  
Phenotype  
Single nucleotide polymorphisms  
CL 15.+

### **GENETIC PREDISPOSITION**

- DT 1995
- SN The presence of genetic factors indicating a higher-than-average risk, but not the certainty, that an individual will develop a disorder later in life
- BT Genotype
- RT Genetic disorders+  
Genetic testing
- CL 15.2 or 15.3

### **GENETIC PRIVACY**

- DT 2007 (was GENETIC INFORMATION, 1997-2001)
- SN The protection of genetic information about an individual, family, or population group, from unauthorized disclosure (MeSH)
- BT Genetic information  
Privacy
- RT Confidentiality+  
DNA fingerprinting  
Genetic databases  
Genetic research+  
Genetic testing
- CL 15.+ and 8.4

### **GENETIC RELATEDNESS TIES**

- DT 2007
- SN The psychological significance of being linked genetically to another person, for example, one's child
- UF Genetic kinship ties  
Genetic relationship ties  
Kinship ties, genetic
- BT Psychosocial genetics
- CL (15.1 or 15.2) and/or 14.+

### **GENETIC RESEARCH**

- DT 1995
- SN Broadly, investigation into the cause, transmission, amelioration, elimination, or enhancement of inherited disorders and/or traits
- BT Biomedical research  
Genetics
- NT Genetic patents  
HapMap Project  
Human Genome Diversity Project  
Human Genome Project  
Recombinant DNA research
- RT Genetic databases  
Genetic epidemiology  
Genetic information+  
Genetic intervention+  
Genetic privacy  
Genome mapping+  
Research subjects+
- CL 15.1 (or 15.7 for biohazards of genetic research)

### **GENETIC RESOURCES**

- DT 2008

SN Genetic materials found in an ecosystem or a population group that are of actual or potential value in commerce or research; not used to index literature or database resources on genetics  
 BT Genetic materials  
 RT Benefit sharing  
 Biodiversity  
 CL 15.+

### **GENETIC SERVICES**

DT 1997  
 SN Organized services to provide diagnosis, treatment, and prevention of genetic disorders  
 BT Clinical genetics  
 RT Gene therapy  
 Genetic counseling  
 Genetic testing  
 Preimplantation diagnosis  
 Prenatal diagnosis+  
 CL 15.2 or 15.3 or 15.4

### **GENETIC TECHNIQUES**

DT 2007  
 SN Chromosomal, biochemical, intracellular, and other methods used in the study of genetics (MeSH)  
 BT Genetics  
 NT Cloning+  
 DNA fingerprinting  
 Gene transfer techniques  
 Genetic association studies+  
 Genome mapping+  
 Nuclear transfer techniques+  
 RT Genetic engineering+  
 Pedigree  
 CL 15.+

### **GENETIC TESTING**

DT 1974  
 SN The use of, on a (smaller or larger) population group, of diagnostic procedures intended to identify either individuals affected by a genetic disorder or asymptomatic carriers of a particular genetic trait  
 UF Genetic screening  
 Predictive genetic testing (use GENETIC TESTING and (predictive or GENETIC PREDISPOSITION or LATE-ONSET DISORDERS+))  
 Public health-oriented genetic screening (use GENETIC TESTING and (MASS SCREENING or PUBLIC HEALTH))  
 Screening, genetic  
 Testing, genetic  
 BT Clinical genetics  
 Genetic intervention  
 RT DNA fingerprinting  
 Genetic counseling  
 Genetic information+  
 Genetic predisposition  
 Genetic privacy  
 Genetic services

Mandatory testing  
Mass screening  
Preimplantation diagnosis  
Prenatal diagnosis+  
CL 15.3

#### **GENETICALLY MODIFIED ANIMALS**

DT 2007 (was TRANSGENIC ANIMALS, 1990-2001)  
SN Animals whose genomes have been altered by genetic engineering, or their offspring (MeSH)  
UF GM animals  
Transgenic animals  
BT Genetically modified organisms  
RT Genetically modified food  
CL 15.1 and 22.3

#### **GENETICALLY MODIFIED FOOD**

DT 2007  
SN Food derived from genetically modified organisms (MeSH)  
UF GM food  
BT Genetic engineering  
RT Genetically modified animals  
Genetically modified plants  
CL 15.1 and 1.3.11

#### **GENETICALLY MODIFIED ORGANISMS**

DT 2007 (was TRANSGENIC ORGANISMS, 1997-2001)  
SN Organisms whose genome has been changed by a genetic engineering technique (MeSH)  
UF GMOs  
Transgenic organisms  
BT Genetic engineering  
NT Genetically modified animals  
Genetically modified plants  
RT Genetically modified food  
Transgenes  
CL 15.1 and (1.3.11 or 22.3)

#### **GENETICALLY MODIFIED PLANTS**

DT 2007  
SN Plants, or their progeny, whose genomes have been altered by genetic engineering (MeSH)  
UF Genetically modified crops  
Genetically modified seeds  
GM plants  
Transgenic plants  
BT Genetically modified organisms  
RT Genetically modified food  
CL 15.1 and 1.3.11

#### **GENETICS**

DT 1974  
SN The branch of science concerned with the means and consequences of transmission and generation of the components of biological inheritance (Stedman's Online Medical

Dictionary)  
 BT Biology  
 NT Behavioral genetics+  
 Clinical genetics+  
 Forensic genetics+  
 Genetic disorders+  
 Genetic epidemiology  
 Genetic information+  
 Genetic intervention+  
 Genetic materials+  
 Genetic phenomena+  
 Genetic research+  
 Genetic techniques+  
 Genomics+  
 Pharmacogenetics  
 Population genetics+  
 Psychiatric genetics  
 Psychosocial genetics+  
 Sociobiology  
 CL 15.+

### **GENOME**

DT 2007  
 SN All of the DNA contained in an organism or a cell, which includes both the chromosomes within the nucleus and the DNA in mitochondria (National Human Genome Research Institute Talking Glossary, 2007)  
 BT Genetic materials  
 NT Human genome  
 RT DNA sequences  
 Genomics+  
 CL 15.+

### **GENOME MAPPING**

DT 1989  
 SN The use of genetic techniques to produce a detailed overview of the gene locations within a genome  
 BT Genetic techniques  
 NT Human Genome Project  
 RT Genetic research+  
 CL 15.10

### **GENOME-WIDE ASSOCIATION STUDIES**

DT 2008  
 SN Studies of genetic variation across the entire human genome that are designed to identify genetic associations with measurable traits (such as blood pressure or weight), or the presence or absence of a disease or condition (Genome-Wide Association Studies (GWAS) Web Site, accessed 2/14/08)  
 UF Whole-genome association studies  
 BT Genetic association studies  
 CL 15.+

### **GENOMICS**

DT 2007  
 SN The systematic study of the complete DNA sequences (genomes) of organisms (MeSH)

BT Genetics  
NT Human Genome Project  
Nutrigenomics  
Personal genomics  
Proteomics  
RT Genome+  
Human Genome Project  
CL 15.1

### **GENOTYPE**

DT 2007  
SN The genetic makeup, as distinguished from the physical appearance, of an organism  
BT Genetic phenomena  
NT Genetic carriers  
Genetic predisposition  
Haplotypes  
RT Phenotype  
CL 15.+

### **HAPLOTYPES**

DT 2010  
SN Sets of DNA variations, or polymorphisms, that tend to be inherited together (National Human Genome Research Institute Talking Glossary of Genetic Terms, accessed 1/2010)  
BT Genotype  
RT HapMap Project  
CL 15.+

### **HapMap PROJECT**

DT 2007  
SN An international effort to identify and catalog genetic similarities and differences in human beings. Using the information in the HapMap, researchers will be able to find genes that affect health, disease, and individual responses to medications and environmental factors. The Project is a collaboration among scientists and funding agencies from Japan, the United Kingdom, Canada, China, Nigeria, and the United States (from the International HapMap Project webpage)  
UF International HapMap Project  
BT Genetic research  
RT Genetic diversity  
Haplotypes  
Population genetics+  
CL (15.1 or 15.10) and 13.1 and 21.1

### **HEMOGLOBINOPATHIES**

DT 2010  
SN A group of inherited disorders characterized by structural alterations within the hemoglobin molecule (MeSH)  
BT Genetic disorders  
NT Sickle cell anemia  
Thalassemia  
CL 15.+ and scattered

### **HEMOPHILIA**

DT 1974  
SN A group of inherited bleeding disorders in which the ability of blood to clot is impaired

(Medicine.net, accessed 11/25/08)

BT Genetic disorders  
CL 15.+

### **HUMAN GENOME**

DT 2007  
SN The complete genetic complement contained in the DNA of a set of chromosomes in a human (MeSH, truncated)  
BT Genome  
CL 15.+

### **HUMAN GENOME DIVERSITY PROJECT**

DT 2007 (was GENETIC DIVERSITY, 1998-2001)  
SN An international research effort, under the auspices of the Human Genome Organization (HUGO), to collect biological samples from different population groups throughout the world, with the aim of building a representative database of human genetic diversity  
UF HGDP  
BT Genetic research  
RT Genetic diversity  
Human Genome Project  
Population genetics+  
CL 15.10 and 13.1 and 21.1

### **HUMAN GENOME PROJECT**

DT 2007 (was GENOME MAPPING, 1989-2001)  
SN An international research effort, completed in April 2003, to map and sequence all of the genes of the human genome  
UF HGP  
BT Genetic research  
Genome mapping  
Genomics  
RT Human genome  
Human Genome Diversity Project  
CL 15.10

### **HUNTINGTON DISEASE**

DT 1974  
SN A familial disorder inherited as an autosomal dominant trait and characterized by the onset of progressive chorea and dementia in the fourth or fifth decade of life (MeSH, truncated)  
BT Late-onset disorders  
CL 15.+

### **INDUCED PLURIPOTENT STEM CELLS**

DT 2009  
SN Pluripotent stem cells that are artificially derived from non-pluripotent cells, typically adult somatic cells, through a variety of laboratory techniques  
UF iPS cells  
BT Pluripotent stem cells  
RT Adult stem cells  
Altered nuclear transfer  
CL 18.7

### **KLINEFELTER SYNDROME**

DT 2010  
SN A chromosomal condition that affects male sexual development (Genetics Home Reference, accessed 1/20/10)  
BT Chromosome abnormalities  
CL 15.+

### **LATE-ONSET DISORDERS**

DT 1995 (was GENETIC DISORDERS *or* HUNTINGTON'S DISEASE, 1974-1994)  
UF Adult-onset genetic disorders  
Late-onset genetic disorders  
BT Genetic disorders  
NT Huntington disease  
CL 15.+

### **MUTATION**

DT 2010  
SN Any detectable and heritable alteration in the genetic material that causes a change in the genotype and that is transmitted to daughter cells and to succeeding generations (MeSH, truncated)  
BT Genetic phenomena  
CL 15.+

### **NUCLEAR REPROGRAMMING**

DT 2009  
SN The process that reverts cell nuclei of fully differentiated somatic cells to a pluripotent or totipotent state  
BT Genetic phenomena  
RT Nuclear transfer techniques+  
CL 15.1 or 18.7

### **NUCLEAR TRANSFER TECHNIQUES**

DT 2007  
SN Methods of implanting a cell nucleus from a donor cell into an enucleated acceptor cell. Often the nucleus of a somatic cell is transferred into a recipient ovum or stem cells with the nucleus removed (adapted from MeSH)  
BT Genetic techniques  
NT Altered nuclear transfer  
RT Cloning+  
Nuclear reprogramming  
Stem cells+  
CL 14.5 or 15.1

### **NUTRIGENOMICS**

DT 2008  
SN The study of how different foods may interact with those having specific genotypes to increase or decrease the risk of common chronic diseases such as type-2 diabetes, obesity, heart disease, stroke, and certain cancers; nutrigenomics also seeks to provide a molecular understanding of how common chemicals in the diet affect health by altering the expression of genes and the structure of an individual's genome (MedicineNet.com, accessed 2/14/08)  
UF Genomics, Nutritional  
Nutrigenetics  
BT Genomics  
RT Nutrition

CL 15.1

### **PEDIGREE**

DT 2007

SN A record of descent or ancestry, particularly of a particular condition or trait, indicating individual family members, their relationships, and their status with respect to the trait or condition (MeSH)

BT Genetic information

RT Genetic ancestry  
Genetic techniques+

CL 15.+

### **PERSONAL GENOMICS**

DT 2008

SN Analysis of the DNA of a particular individual's genome

UF Genomics, personal

BT Genomics

RT Personalized medicine  
Pharmacogenetics

CL 15.1 or 15.10

### **PHARMACOGENETICS**

DT 2007

SN A branch of genetics that deals with the genetic variability in individual responses to drugs and drug metabolism

UF Pharmacogenomics

BT Genetics

RT Genetic ancestry  
Personal genomics  
Toxicogenetics

CL 15.1 and 9.7

### **PHENOTYPE**

DT 2007

SN The outward appearance of an organism, as determined by both its genetic makeup and environmental influences

BT Genetic phenomena

RT Genotype+

CL 15.+

### **PHENYLKETONURIA**

DT 1974

SN A genetic disorder in which the body lacks the enzyme necessary to metabolize phenylalanine to tyrosine. Left untreated, the disorder can cause brain damage and progressive mental retardation as a result of the accumulation of phenylalanine and its breakdown products (American Heritage Dictionary of the English Language, 4<sup>th</sup> ed., 2006)

UF PKU

BT Genetic disorders

CL 15.+

### **PLURIPOTENT STEM CELLS**

DT 2008

SN Cells that are able to develop into many different types of cells or tissues in the body or in

tissue culture  
BT Stem cells  
NT Induced pluripotent stem cells  
CL 18.7

### **POPULATION GENETICS**

DT 2000  
SN The study of the genetic composition of populations  
UF Genetics, population  
BT Genetics  
NT Genetic ancestry  
RT Gene pool  
Genetic diversity  
Genetic epidemiology  
HapMap Project  
Human Genome Diversity Project  
CL 15.1 and 13.1

### **PREIMPLANTATION DIAGNOSIS**

DT 1991  
SN Determination of the genetic makeup of an early human embryo prior to implantation  
BT Clinical genetics  
Diagnosis  
Genetic intervention  
RT Genetic services  
Genetic testing  
Prenatal diagnosis+  
Sex predetermination  
CL 15.2 and 14.4

### **PRENATAL DIAGNOSIS**

DT 1974  
SN Determination of fetal status prior to birth  
UF Alpha-fetoprotein screening  
Antenatal diagnosis  
BT Clinical genetics  
Diagnosis  
Genetic intervention  
NT Amniocentesis  
Chorionic villi sampling  
Sex determination  
RT Fetal therapy  
Genetic counseling  
Genetic services  
Genetic testing  
Preimplantation diagnosis  
CL 15.2

### **PROTEOMICS**

DT 2008  
SN The study of the expression, localizations, functions, and interactions of the full set of proteins encoded by a genome ((American Heritage Science Dictionary, 2005, truncated)  
BT Genomics+  
CL 15.+

### **PSYCHIATRIC GENETICS**

- DT 2009; *was* GENETICS *and* PSYCHIATRY  
SN The study of the genetic causes and modes of inheritance that underlie the generally recognized mental illnesses (answers.com)  
BT Genetics  
RT Psychiatry  
CL 15.1 and 17.1

### **PSYCHOSOCIAL GENETICS**

- DT 2007  
SN The psychological and cultural impact of genetic factors on behaviors, attitudes, and beliefs; do not confuse with Behavioral Genetics, which is a branch of genetics that studies effects of genetics on behavior  
UF Geneticization  
BT Genetics  
Psychology  
NT Genetic discrimination  
Genetic identity  
Genetic relatedness ties  
CL 15.+

### **RECOMBINANT DNA RESEARCH**

- DT 1978  
SN Research using biologically active DNA that has been formed in the laboratory by the joining of segments of DNA from different sources  
BT Genetic engineering  
Genetic research  
RT Containment of biohazards  
CL 15.1 (or 15.7 for biohazards of recombinant DNA research)

### **RNA**

- DT 2008  
SN A nucleic acid found in all living cells that plays many roles in the storage and transmission of genetic information, including the delivery of DNA's genetic message to the cytoplasm, where proteins are made  
UF Ribonucleic acid  
BT Genetic materials  
CL 15.+

### **SICKLE CELL ANEMIA**

- DT 1974  
SN A disease passed down through families in which red blood cells are an abnormal crescent shape (Millenium MedlinePlus Medical Encylopedia, accessed 12/4/08)  
BT Hemoglobinopathies  
CL 15.+ or scattered

### **SINGLE NUCLEOTIDE POLYMORPHISMS**

- DT 2010  
SN Single nucleotide variations in a genetic sequence that occur at appreciable frequency in the population (MeSH); scientists are studying how single nucleotide polymorphisms, or SNPs (pronounced "snips"), in the human genome correlate with disease, drug response, and other phenotypes (National Human Genome Research Institute Talking Glossary of Genetic Terms, accessed 1/20/10)  
UF Polymorphisms, single nucleotide

SNPs  
BT Genetic phenomena  
CL 15.+

### **SOCIOBIOLOGY**

DT 1977  
SN The study of biological influences on social behavior, based on the theory that such behavior is often genetically transmitted and subject to evolutionary processes (adapted from Amer Heritage Dictionary of the English Language, 4<sup>th</sup> ed, 2000)  
BT Genetics  
RT Behavioral genetics+  
Evolution  
CL 15.9

### **STEM CELLS**

DT 2007  
SN Cells with the ability to divide for indefinite periods in culture and to give rise to more specialized cells  
BT Body parts and fluids  
NT Adult stem cells  
Embryonic stem cells  
Pluripotent stem cells+  
RT Stem cell transplantation  
CL 18.7

### **SYNTHETIC BIOLOGY**

DT 2008  
SN The field at the interface of engineering and biology that involves designing and building systems from biological components (Nature Reviews Genetics: Glossary Terms, accessed 1/22/08)  
UF Artificial life†  
Life, synthetic†  
Synthetic life†  
BT Biology  
Biotechnology  
CL 1.3.9 and/or 15.1

### **TAY SACHS DISEASE**

DT 1974  
SN An autosomal recessive neurodegenerative disorder characterized by the onset in infancy of an exaggerated startle response, followed by paralysis, dementia and blindness (MeSH, truncated)  
BT Genetic disorders  
CL 15.+

### **THALASSEMIA**

DT 1977  
SN A group of inherited disorders characterized by reduced or absent amounts of hemoglobin, the oxygen-carrying protein inside the red blood cells (answers.com, accessed 11/25/08)  
BT Hemoglobinopathies  
CL 15.+

### **TOXICOGENETICS**

DT 2009; *was* GENETICS *and* (HEALTH HAZARDS *or* TOXICITY), 1974-2001

SN The study of existing genetic knowledge, and the generation of new genetic data, to understand and thus avoid drug toxicity and adverse effects from toxic substances in the environment (MeSH)  
UF Toxicogenomics  
BT Genetics  
RT Health hazards  
Pharmacogenetics  
Toxicity  
CL 15.1 (often *with* 9.7 or 16.1)

### **TRANSGENES**

DT 2010  
SN Genes that have been introduced into an organism using gene transfer techniques (MeSH, truncated); in some circumstances these genes can then spread from the genetically modified organism into wild populations  
BT Genes  
RT Genetically modified organisms+  
CL 15.+

### **TRISOMY**

DT 2008  
SN The possession of a third chromosome number at a particular location in the genome when two chromosomes would be the usual number; trisomy 21 is also called Down syndrome  
BT Chromosome abnormalities  
NT Down syndrome  
CL 15.+

### **TURNER SYNDROME**

DT 2010  
SN A chromosomal condition that affects development in females (Genetics Home Reference, accessed 1/20/10)  
BT Chromosome abnormalities  
CL 15.+

### **XYY KARYOTYPE**

DT 1975  
SN A chromosome arrangement in males that is characterized by an extra Y chromosome  
BT Chromosome abnormalities  
RT Behavioral genetics+  
CL 15.+

## GENETICS TREE FOR THE 2010 BIOETHICS THESAURUS

### GENETICS

- BEHAVIORAL GENETICS
  - GENETIC DETERMINISM
- CLINICAL GENETICS
  - GENE THERAPY
  - GENETIC COUNSELING
  - GENETIC SERVICES
  - GENETIC TESTING
  - PREIMPLANTATION DIAGNOSIS
  - PRENATAL DIAGNOSIS
- FORENSIC GENETICS
  - DNA FINGERPRINTING
- GENETIC DISORDERS
  - CANAVAN DISEASE
  - CHROMOSOME ABNORMALITIES
    - FRAGILE X SYNDROME
    - KLINEFELTER SYNDROME
    - TRISOMY
      - DOWN SYNDROME
      - TURNER SYNDROME
      - XYY KARYOTYPE
  - CYSTIC FIBROSIS
  - DUCHENNE MUSCULAR DYSTROPHY
  - GAUCHER DISEASE
  - HEMOGLOBINOPATHIES
    - SICKLE CELL ANEMIA
    - THALASSEMIA
  - HEMOPHILIA
  - KLINEFELTER SYNDROME
  - LATE-ONSET DISORDERS
    - HUNTINGTON DISEASE
  - PHENYLKETONURIA
  - TAY SACHS DISEASE
- GENETIC EPIDEMIOLOGY
- GENETIC INFORMATION
  - GENETIC DATABASES
  - GENETIC PRIVACY
  - PEDIGREE
- GENETIC INTERVENTION
  - EUGENICS
  - GENETIC COUNSELING
  - GENETIC ENGINEERING
    - BIOTECHNOLOGY
      - SYNTHETIC BIOLOGY
    - CHIMERAS
    - GENE THERAPY
    - GENETIC ENHANCEMENT
    - GENETICALLY MODIFIED FOOD
    - GENETICALLY MODIFIED ORGANISMS
      - GENETICALLY MODIFIED ANIMALS
      - GENETICALLY MODIFIED PLANTS
    - RECOMBINANT DNA RESEARCH

- GENETIC TESTING
- PREIMPLANTATION DIAGNOSIS
- PRENATAL DIAGNOSIS
- GENETIC MATERIALS
  - DNA
  - DNA SEQUENCES
  - GENES
    - APO-E GENES
    - BRCA1 GENES
    - BRCA2 GENES
    - TRANSGENES
  - GENETIC RESOURCES
  - GENOME
    - HUMAN GENOME
  - RNA
- GENETIC PHENOMENA
  - EPIGENETICS
  - EVOLUTION
  - GENE POOL
  - GENETIC DETERMINISM
  - GENETIC DIVERSITY
  - GENETIC MARKERS
  - GENOTYPE
    - GENETIC CARRIERS
    - GENETIC PREDISPOSITION
    - HAPLOTYPES
  - MUTATION
  - NUCLEAR REPROGRAMMING
  - PHENOTYPE
  - SINGLE NUCLEOTIDE POLYMORPHISMS
- GENETIC RESEARCH
  - GENETIC PATENTS
  - HapMap PROJECT
  - HUMAN GENOME DIVERSITY PROJECT
  - HUMAN GENOME PROJECT
  - RECOMBINANT DNA RESEARCH
- GENETIC TECHNIQUES
  - CLONING
    - ANIMAL CLONING
  - DNA FINGERPRINTING
  - GENE TRANSFER TECHNIQUES
  - GENETIC ASSOCIATION STUDIES
    - GENOME-WIDE ASSOCIATION STUDIES
  - GENOME MAPPING
  - NUCLEAR TRANSFER TECHNIQUES
    - ALTERED NUCLEAR TRANSFER
- GENOMICS
  - HUMAN GENOME PROJECT
  - NUTRIGENOMICS
  - PERSONAL GENOMICS
  - PROTEOMICS
- PHARMACOGENETICS
- POPULATION GENETICS
  - GENETIC ANCESTRY

PROTEOMICS  
PSYCHIATRIC GENETICS  
PSYCHOSOCIAL GENETICS  
    GENETIC DISCRIMINATION  
    GENETIC IDENTITY  
    GENETIC RELATEDNESS TIES  
SOCIOBIOLOGY  
STEM CELLS  
    ADULT STEM CELLS  
    EMBRYONIC STEM CELLS  
    PLURIPOTENT STEM CELLS  
        INDUCED PLURIPOTENT STEM CELLS  
TOXICOGENETICS

**APPENDIX:  
EXAMPLES OF GENETICS-RELATED KEYWORD IDENTIFIERS, 2010**

Advisory Group on Human Gene Patents and Genetic Testing (Australia)  
Alberta Eugenics Board  
American Society of Medical Genetics  
Asilomar Conference  
BiDil  
BioBank Japan Project  
California Institute for Regenerative Medicine  
Celera Genomics  
Church, George  
Collins, Francis  
Convention on Biological Diversity  
deCode Genetics  
deCODEMe  
Diamond v. Chakrabarty  
Empire State Stem Cell Board  
Estonian Genome Project  
EuroBioBank  
European Society of Human Genetics  
Genetic Information Nondiscrimination Act (GINA)  
Geron Corp.  
Human Genetics Advisory Committee (Australia)  
Human Genetics Commission (Great Britain)  
Human Genome Organization (HUGO)  
International Declaration on Human Genetic Data  
International Society of Nurses in Genetics  
Monsanto Company  
Myriad Genetics Inc.  
National Human Genome Research Institute  
National Institute for Human Genome Research  
National Society of Genetic Counselors  
Navigenics  
NCHGR Program on Ethical, Legal, and Social Implications (ELSI)  
NHGRI Program on Ethical, Legal, and Social Implications (ELSI)  
NIH-DOE Working Group on Ethical, Legal, and Social Implications (ELSI)  
1,000 Genomes Project  
Personal Genome Project  
Public Population Project in Genomics  
Recombinant DNA Advisory Committee  
Schmeister v. Monsanto Company  
Secretary's Advisory Committee on Genetics, Health, and Society [SACGHS]  
Statement on Human Genomic Databases (HUGO Ethics Committee)  
Taiwan Biobank Project  
Targeted Genetics Corp.  
23andMe  
UK Biobank  
Universal Declaration on the Human Genome and Human Rights  
Venter, J. Craig