

# Index

*Compiled by Linda English*

The page numbers in bold type refer to definitions in the text.

- additive gene effects **39**
- adoption studies 35–36, 150
- adoptee's family studies **35**
- adoptive studies **35**
- affective disorders 114–115
- alcoholism 36, 165–166 & Table 9.3, 167
- conduct disorder 180
- cross-fostering studies 35, 92, 150, 167
- hyperactivity, childhood 182–183
- schizophrenia 36, 90–92 & Table 5.2
- affected relative pairs:
  - linkage studies 60
- affective disorders 110–127, 155, 222
- adoption studies 114–115
- adversity and 119–120, 219–220
- alcoholism and 49, 166–167
- anxiety and 120, 133, 134–135
- in childhood 178–179
- eating disorders and 139
- family studies 110–112 & Table 6.1, 118 Table 6.4
- linkage/association studies and molecular biology 122–124
- modes of transmission 115–117
- neurotic and endogenous depression 117–118
- schizophrenia and 93–94
- sex differences 121–122
- twin studies 34, 50 & Table 2.4, 112–114 & Tables 6.2–6.3, 118, 119 Table 6.5
- age correction 31 Box 2.1, 32
- agoraphobia 131–132 & Table 7.2, 138
- Aicardi syndrome 71 Table 4.4
- alcoholism 150, 161–173, 220
  - adoption studies 36, 165–166 & Table 9.3, 167
  - biological basis 168–170
  - depression and 49, 166–167
  - family studies 161–162 & Table 9.1
  - subtypes 167
  - twin studies 163–164 & Table 9.2
  - 'normal' use 164–165
- alleles **1, 37**
  - marker: identical by descent (IBD)/by state (IBS) 60
- allelic association *see* association studies
- allelic heterogeneity **59**
- Alzheimer's disease (AD) 59, 192–205, 220, 224
  - familial (FAD) 197–198
  - chromosome 14 linkage 204
  - chromosome 21 linkage 25, 78, 199–201 & Fig.11.1, 202
  - genetic epidemiology 194–196
  - mode of transmission 47, 52, 198–199
  - molecular genetics of 199–205
  - senile plaques and neurofibrillary tangles 192–193
  - twin studies 196
- amyloid precursor protein (APP) gene: link with Down's syndrome and Alzheimer's disease 78, 193, 199, 202–204
- aneuploidies **7, 77**
- Angelman syndrome 14, 81–82
- animal studies
  - alcoholism 169
  - gene expression in central nervous system 27,28
  - genetics of normal personality 146–147
- anorexia nervosa 139–140, 141, 222
- anticipation 14, 76–77, 207–208
- antisocial personality 149–151
- anxiety
  - depression and 120, 133, 134–135
  - disorders in childhood 179–180
  - neurosis 130–132 & Table 7.2
  - see also* neurotic disorders
- anxious personality 151
- Apert's syndrome 70 Table 4.2
- Argininosuccinic aciduria 72 Table 4.5
- ascertainment of probands **31–32**
- association studies 60–63 & Table 3.1, 123, 141–142, 205
- classical markers:
  - schizophrenia 100–101
  - DNA markers in 26
- ataxia telangiectasia 71 Table 4.3
- autosomes **1**
  - anomalies of and mental retardation 77–78, 79 Table 4.6
  - disorders of and mental retardation 70–74 & Tables 4.2–4.3 & Table 4.5
- bacteria and molecular cloning 15–16 & Fig.1.7
- Barr body **2**
- base pairing rule and DNA 8 Fig.1.4, 9, 15
- Bezugsziffer* 31 Box 2.1
- biological markers
  - infantile autism 177
  - personality disorder 155
- bipolar (BP) disorder 38, 47, 52, 93, 94, 111–112 & Tables 6.1–6.2, 113 & Table 6.3, 115, 116–117, 121, 139
- borderline personality disorder 154–155
- brain, study of gene expression in 26–28
- Briquet syndrome 150–151, 152–153
- bulimia nervosa 44 & Table 4.2, 139–141
- candidate gene studies 24, 25–26, 27, 124
- schizophrenia 103–104
- carriers: sex-linked traits **38**
- cell division 2–5 & Figs 1.1–1.2
- central nervous system (CNS)
  - response to alcohol 168

- study of gene expression in 26–28
- Charcot-Marie-Tooth (CMT) neuropathy 59
- childhood psychiatric disorders 174–191
- chromatin 1
- chromosomal abnormalities 25, 155
  - cytogenetic techniques and 7–8
  - familial Alzheimer's disease and *see under* Alzheimer's disease, familial
  - mental retardation and 77–80 & Table 4.6
- chromosomes 1–8
  - behaviour during cell division 2–5
  - cytogenetic techniques and application 5–8, 55
- clinical practice: ethical issues 222–225
- complementary DNA (cDNA) 15–16
- concordance and twin studies 33–34
- conduct disorder 180–181, 182
- Creutzfeldt–Jakob disease (CJD) 206, 210–211
- Cri du chat syndrome 79 Table 4.6
- criminality 149–151, 155, 167, 180–181
- cross-fostering studies 35, 92, 150, 167
- crossing over (recombination) 4 Fig.1.2, 5, 55
- Crouzon's syndrome 70 Table 4.2
- cytogenetic techniques and application 5–8 & Fig.1.3, 55
  
- deletions 7, 12, 20, 25
- dementia 192–217
- deoxyribonucleic acid (DNA) 1
  - classes of in genome 10–11
  - complementary (cDNA) 15–16
  - enhancer/promoter regions 11 & Fig.1.6
  - markers
    - in association studies 26 and disease 20–24
    - linkage studies with 24–26, 102–103
  - mutation and variation 12–13
  - probes 15–17
  - recombinant DNA technology and new genetics 14–19
  - sequencing 15, 18
  - structure 8–9 & Fig.1.4
  - unstable sequences 13–14, 76–77, 207–208
- depression *see* affective disorder
- diploid/haploid distinction and cell division 3
- dizygotic (DZ)/fraternal twins 32–33
- dominant disorders 38
  - autosomal, and mental retardation 70 Table 4.2
- dominant traits 36–37, 39, 41
- dopamine receptor genes alcoholism and 170
- schizophrenia and 102, 103
- double back-cross matings 37, 55–56 & Fig.3.1
- Down's syndrome (trisomy 21) 77–78, 79 Table 4.6
  - link with Alzheimer's disease and chromosome 21: 25, 78, 193, 194, 203–204
- Duchenne muscular dystrophy 25, 59, 71 Table 4.4
- duplications 7
  
- eating disorders 44 & Table 4.2, 139–142, 222
- Edward's syndrome 79 Table 4.6
- endogenous depression 117–118
- enuresis, childhood 183
- environment 219–220
  - alcoholism and 164, 166–167
  - bulimia nervosa and 140–141
  - contributors to variance in 41–42
  - depression and 119–120, 121
  - path analysis and 42–45
  - twin studies and 34–35
  - see also under* genes
- epistasis 44, 134
- equilibrium and allelic association 61
- ethical issues 221–225
- eugenics 221, 225
- exclusion and linkage studies 57
- exons and introns 9–10
  
- familial Alzheimer's disease *see under* Alzheimer's disease
- family studies 30–32
  - affective disorder 110–112 & Table 6.1
  - in childhood 178–179
  - alcoholism 161–162 & Table 9.1
- conduct disorder 180
- developmental reading disorders 183
- family history method 30–31
- family study method 31
- hyperactivity, childhood 181
- infantile autism 175–176
- neurosis 128–129
- obsessive–compulsive disorder 135–137
- tics and Tourette's syndrome 184–185
- foetal karyotyping 7
- fragile sites 7, 75
- fragile X syndrome 7, 14, 38, 74, 75–77, 178, 207–208
- frame shift mutations 12
  
- galactosaemia 72 Table 4.5
- gametes 2, 3
- Gaucher disease 73 Table 4.5
- generalised anxiety disorder (GAD) 130–133 & Table 7.2
- genes 1
  - and environment:
    - co-actions 44
    - covariance 45
    - interactions 44–45, 221–222
    - infantile autism and 177–178
    - neurotic disorders and 133–134
    - non-additive effects 44–45
  - gene–gene interactions 44, 134
  - structure and expression 9–10 & Fig.1.5, 11 Fig.1.6
  - study of expression in central nervous system 26–28
- genetic counselling 218–221
- genetic fingerprinting 13, 33
- genetic linkage 5
  - see also* linkage studies
- genetic markers 55
  - classical 55, 100–102, 122–123, 141
  - informativeness of 23
  - see also under* deoxyribonucleic acid
- genetic marker studies
  - alcoholism 169–170
  - neuroses and eating disorders 141–142
  - personality 155–156
  - schizophrenia 25, 58, 100–103
  - see also* association studies; linkage studies
- genetics, formal: historical origins 36
- genomic imprinting 14, 76, 81

- genomic phenomena that decrease familial resemblance 13–14
- genotype **36**
- germ line mutations **13**
- Gerstmann–Straussler syndrome (GSS) 210, 211
- Hardy–Weinberg equilibrium **39**
- Hartnup disease 72 Table 4.5
- hemizygous, males as, and sex-linked traits **37–38**
- hereditary cerebral hemorrhage with amyloidosis (HCHWA) 202, 203, 206
- heredity
- chromosomal basis 1–8
  - molecular basis 8–13
  - heritability of a trait **41**
- heterogeneity
- genetic 59, 70
  - and multiple thresholds 47–49
  - phenotypic 70
  - of schizophrenia 48, 95–98 & Table 5.3
- heterozygotes **1, 36**
- high-resolution banding and chromosomal analysis 6–7
- histocompatibility (HLA) antigens, marker studies with 55, 100–101, 123, 141
- homocystinuria 72 Table 4.5
- homosexuality 148–149
- homotypia
- affective disorder and **111, 113**
  - schizophrenia and **96**
- homozygotes **1, 36**
- human genome
- classes of DNA in 10–11
  - mapping of 18, 24, 63
- human karyotype **1**
- Hunter syndrome 73 Table 4.5
- Huntington's disease (HD) 14, 38, 207–209
- predictive testing 208, 220, 222–223, 224, 225
- Hurler's syndrome 73 Table 4.5
- hyperactivity, childhood 181–183
- hysterical personality 152–153
- idiopathic mental retardation 66–69 & Fig.4.1
- imprinting, genomic **14, 76, 81**
- inbred populations **38**
- incomplete penetrance 46, 58
- independent assortment **3, 37 & Table 2.1**
- infantile autism 75, 175–178
- insertions **12**
- in situ* hybridisation
- histochemistry (ISHH) 27–28
- intelligence quotient (IQ) 43, 44 & Table 2.2
- and mental retardation 66, 67 Fig.4.1, 68–69, 80
- intra-class correlation coefficient **33**
- introns and exons **9–10**
- inversions **7**
- iterative model fitting 49–50, 52
- juvenile delinquency 149, 180–181
- karyotype, human **1**
- karyotyping 5–7 & Fig.1.3
- Klinefelter's syndrome (XXY) 2, 79–80 & Table 4.6
- kuru 210, 211
- Laurence–Moon–Biedl syndrome 71 Table 4.3
- Lesch–Nyhan syndrome 38, 71 Table 4.4
- liability/threshold models 45–49 & Figs 2.6–2.8, 51–52 & Fig.2.9, 115–116, 153
- libraries and molecular cloning **17**
- life events and depression 119–120
- lifetime incidence/expectancy **32**
- lifetime prevalence **32**
- likelihood ratio tests 51, 59
- linkage disequilibrium **61, 63**
- linkage studies 22–24, 55–57 & Figs 3.1–3.2
- affective disorder 122–124
  - Alzheimer's disease 199–205 & Fig.11.1
  - with classical markers 55, 101–102, 122–123, 141
  - and complex disorders 57–59
  - with DNA markers 22–24, 102–103
  - Huntington's disease 207–208, 222–223
  - model-free 60
  - schizophrenia 25, 101–104
- lipid metabolism and connective tissue disorders 73 Table 4.5
- locus, gene **1, 37**
- locus heterogeneity **59**
- lod scores **56–57 & Fig.3.2**
- Louis Barr syndrome 71 Table 4.3
- Lowe's syndrome 71 Table 4.4
- mandibulofacial dysostosis 70 Table 4.2
- manic depressive illness 58–59, 110–113 & Tables 6.1–6.3, 115, 120, 122–123, 139
- maple syrup urine disease 72 Table 4.5
- Marinesco Sjogren syndrome 71 Table 4.3
- maternal age and increased risk 77, 78, 80, 194
- meiosis 2–5 & Fig.1.2
- Mendel, Gregor, laws of inheritance 36–42 & Table 2.1
- mental retardation 66–86
- aetiology 66–68 & Fig.4.1 & Table 4.1
  - chromosomal abnormalities 77–80 & Table 4.6
  - idiopathic 66–69 & Fig.4.1
  - single-gene defects 69–77 & Tables 4.2–4.5
- messenger RNA (mRNA) 9, 10 Fig.1.5, 27–28
- metabolism
- of alcohol 168
  - inborn errors of 72–73 & Table 4.5
- microcephaly, true 71 Table 4.3
- microsatellite repeats **22**
- mitosis 2, 3 Fig.1.1
- mixed-model inheritance 47, 51 & Fig.2.9, 116
- model fitting 49–52 & Table 2.4, 99–100, 114
- model-free linkage tests 60
- molecular basis of heredity 8–13
- molecular cloning 15–17 & Fig.1.7
- molecular genetics
- application to study of disease 20–26
  - 'central dogma' 9
- monozygotic (MZ)/identical twins **32**
- reared apart (MZA) 34–35
- morbid risk **32**
- mosaicism **77**
- mucopolysaccharidoses 73 Table 4.5
- multifactorial inheritance **41**
- multifactorial (MF) threshold model of disease transmission 45–46 & Fig.2.6
- multi-infarct dementia (MID) 192, 206–207
- multiple incomplete ascertainment **32**
- multiple thresholds and heterogeneity 47–49
- multi-point linkage analysis 57
- mutational testing 224
- mutations 12–13
- amyloid precursor protein 202–204
  - identification of 18–19, 20, 224

- myotonic dystrophy (MD) 14, 76–77, 207, 208
- nephrogenic diabetes insipidus 71 Table 4.4
- neurofibromatosis 46
- neurotic depression 116, 117–118
- neurotic disorders 120, 126–145
- anxiety and depression 120, 133, 134–135
  - in childhood 179–180
  - eating disorders 139–142
  - genetic marker studies 141–142
  - mode of transmission and gene–environment interactions 133–134
  - neurosis as a whole 126–130 & Table 7.1
  - obsessive–compulsive disorder 135–138 & Table 7.3, 151, 179, 185–186
  - specific phobias 138
  - specific syndromes 130–132 & Table 7.2
  - twin studies, population based 132–133
- neurotic personality 151
- neutral mutations 12–13
- Niemann–Pick disease 73 Table 4.5
- non-disjunction 77, 78, 79
- non-recombinants 55–56 & Fig.3.1
- Norrie's disease 71 Table 4.4
- Northern blotting 27
- nucleotide bases and DNA 8
- obesity 139, 141
- obsessional personality 151–152
- obsessive–compulsive disorder (OCD) 135–138 & Table 7.3, 151, 179, 185–186
- oligogenic model of inheritance 47
- pair-wise concordance: twin studies 33
- panic disorder (PD) 130–132 & Table 7.2, 133, 134, 141, 179
- paranoid schizophrenia and HLA system 100–101
- Paris classification of chromosomes 6 Fig.1.3
- Patau's syndrome 79 Table 4.6
- path analysis 42–44 & Figs 2.4–2.5 & Table 2.2, 99
- with model fitting 49–51 & Table 2.4
- penetrance 46 & Table 2.3
- incomplete 46, 76
- perinatal adversity 67 Table 4.1, 177–178, 182
- personality
- alcoholism and 167
  - depression and 120
  - normal, genetics of 43–44 & Table 2.2, 146–149
  - temperament in childhood 174–175
- personality disorders 146–160
- antisocial 149–151
  - anxious/neurotic 151–153
  - borderline 154–155
  - genetic marker studies 155–156
  - hysterical 152–153
  - obsessional 151–152
  - schizoid–schizotypal 94, 99, 153–154, 155
- personality questionnaire studies 147–148
- phenocopies 38
- schizophrenia and 96–98 & Table 5.3
- phenotype(s) 36
- continuous 39–41 & Figs 2.1–2.3
  - irregular, and threshold models 45–47 & Figs 2.6–2.7 & Table 2.3
- phenylketonuria (PKU) 20, 38, 70, 72 & Table 4.5, 74, 177, 222
- phobias 131–132 & Table 7.2, 138, 151
- Pick's disease 209–210
- pleiotropy 48, 62, 63, 95
- point mutations 12, 20
- point prevalence 32
- polygenic inherited traits 41
- polygenic threshold model of disease transmission 45–46 & Fig.2.6
- polymerase chain reaction (PCR) 18–19 & Fig.1.9, 20, 22–23 Fig.1.11, 24, 76
- polymorphic, genetic markers as 55
- populations and heritability 42
- positional cloning 24–25, 206–207
- Prader–Willi syndrome 14, 80–81
- premutation 76
- prevalence and family studies 32
- prien dementia 26, 209–210, 220, 224
- prien protein (PrP) 209, 210
- probands 30
- ascertainment of 31–32
- proband-wise concordance: twin studies 33
- psychiatric genetics: twofold task 30
- psychophysiological studies: normal personality 147
- quantitative genetics 30–54
- quantitative trait loci (QTL) 63, 142, 156, 169
- quasi-continuous disorders 45
- reaction ranges, phenotypic 45
- reading disorders, developmental 183–184
- recessive disorders 38
- autosomal, and mental retardation 71 Table 4.3
- recessive traits 36–37
- reciprocal translocations 7
- recombinant DNA technology and new genetics 14–19 & Fig.1.7
- recombinants 55–56 & Fig.3.1
- recombination 4 Fig.1.2, 5, 24, 55–57, 223
- recombination fraction 56–57 & Fig.3.2
- Refsum disease 73 Table 4.5
- relative risk and association studies 61
- renal (transport) aminoacidurias 72 Table 4.5
- research: ethical issues 221–222
- restriction enzymes 15–16, 21
- restriction fragment length polymorphisms (RFLPs) 21 Fig.1.10, 22, 55
- retinoblastoma, hereditary 13
- ribonucleic acid (RNA) 9, 10 Fig.1.5
- risk alteration, unintentional 220, 224
- Robertsonian translocations 7
- sample stratification 62
- schizoaffective disorder 93–94
- schizoid–schizotypal personality 94, 99, 153–154, 155
- schizophrenia 87–109 & Fig.5.1
- adoption studies 36, 90–92 & Table 5.2
  - candidate gene studies 103–104
  - defining limits of 93–100 & Fig.5.2, 153–154, 155
  - heterogeneity 48, 95–98 & Table 5.3
  - mode of inheritance 47, 52, 98–100
  - genetic counselling/ethical issues 219, 220, 222, 223–224
  - genetic marker studies 25, 58, 100–103

- twin studies 89–90 & Table 5.1
- schizophrenia spectrum disorder 91 Table 5.2, 92, 153, 154
- segregation **3**, **37** & Table 2.1
- segregation analysis 51–52 & Fig.2.9, 99, 116
- sex cell division 2–5 & Fig.1.2
- sex chromosomes **2**
- anomalies 78–80 & Table 4.6
- pseudoautosomal region and schizophrenia 102–103
- sex differences in psychiatric disorder 120–121, 166–167, 185–186
- multiple threshold models and 48–49, 121, 150, 166–167, 177
- sex-linked traits 37–38  
*see also* X-linked disorders
- sexual orientation 148–149
- simple sequence repeats 22  
Fig.1.11, **24**, **103**
- single ascertainment **31**
- single-gene defects and mental retardation 69–77 & Tables 4.2–4.5
- single major locus (SML) model of inheritance 46–47 & Table 2.3 & Fig.2.7
- somatic cell division 2, 3  
Fig.1.1
- somatic mutations **13**
- somatisation disorder 150–151, 152–153
- Southern blotting 17–18 & Fig.1.8
- splicing out non-coding regions and gene expression 10, 11 Fig.1.6
- spongiform encephalopathies 210–211
- staining techniques and karyotyping 5–7
- Tay Sachs disease 73 Table 4.5
- temperament *see* personality
- testing, predictive 7–8, 218, 223–224
- fragile X syndrome 76
- Huntington's disease 208, 220, 222–223, 224, 225
- phenylketonuria 20, 74
- third parties, availability of information to 224–225
- threshold models
- irregular phenotypes and 45–47 & Figs 2.6–2.7 & Table 2.3
- multiple, heterogeneity and 47–49 & Fig.2.8
- tics and Tourette's syndrome (TS) in childhood 184–186
- transcription/translation of genetic information 9–10 & Fig.1.5
- translocations 12, 25, 77
- transmitter males: fragile X syndrome 75, 76
- triple X syndrome 79 Table 4.6
- tuberous sclerosis 13, 59, 70 Table 4.2, 177
- Turner's syndrome (XO) 2, 79 Table 4.6, 80
- twin studies 32–35
- affective disorder 34, 50 & Table 2.4, 112–114 & Tables 6.2–6.3, 118
- alcoholism 163–165 & Table 9.2
- Alzheimer's disease 196
- conduct disorder 180
- developmental reading disorders 183–184
- eating disorders 139–141
- hyperactivity, childhood 182
- infantile autism 176
- neuroses 129–130 & Table 7.1
- neurotic syndromes 132–133
- obsessional symptoms/traits 137–138 & Table 7.3
- personality questionnaires 147–148
- schizophrenia 89–90 & Table 5.1
- tics and Tourette's syndrome 185
- 'two-hit' hypothesis and mutations 13
- uniformity **36**, **37** Table 2.1
- unipolar (UP) disorder 111–112 & Table 6.1, 113 & Table 6.3, 115
- variation in quantitative traits, components of 41–42
- variations affecting protein structure or expression (VAPSE) in genes 63, 104
- Virchow Sekel dwarf 71 Table 4.3
- Weinberg's shorter method of age correction 31 Box 2.1, 32
- Wilson's disease 38
- X-linked disorders 37–38, 121, 123
- and mental retardation 71 Table 4.4, 74–77, 82
- X-linked hydrocephalus 71 Table 4.4
- XYY syndrome 79 Table 4.6, 80, 155
- zygosity in twins, mistaken 33, 34