Pharmacogenomics Genotyping Panels

This document lists the candidate genes included in the six different OSU Pharmacogenomics genotyping panels. These panels were developed for use in evaluating possible genetic contribution to individual variation in:

Drug Metabolizing Enzymes (DME) – pharmacologic drug effects and response  
Inflammation (INF) – predisposition to and progression of inflammatory processes  
DNA Repair – maintenance of the correct DNA sequence in cells  
Cell Cycle – genes controlling cell replication and programmed cell death  
Central Nervous System (CNS) – neurotransmitters, enzymes and receptors  
Coronary Artery Disease (CAD) – candidate genes for heart problems

Suggestions regarding the use of information in this list:  
A good first place to go for information about any gene is the website for the “Gene Cards” database. This gives summaries of chromosome, gene, protein, functional, expression, polymorphism, etc…data on the initial gene page with links to other databases for more extensive follow up. The url for Gene Cards is:  
http://www.genecards.org/index.shtml From the home page type in the gene symbol and select the symbol/alias circle.

Another place to go for more extensive information regarding almost any aspect of these genes is the  NCBI  Entrez cross database search –  
url:  http://www.ncbi.nlm.nih.gov/gquery/gquery.fcgi This is a gateway for dbSNP, HapMap, gene, nucleotide, Blast (sequence similarity) and many other genome resources.
Drug Metabolizing Enzyme genes:

1: LOC732146
hypothetical protein LOC732146 [Homo sapiens]Chromosome: 2GeneID: 732146
2: C1orf167
Official Symbol: C1orf167 and Name: chromosome 1 open reading frame 167 [Homo sapiens]Other Aliases: DKFZp434E1410, RP11-56N19.2Other Designations: hypothetical protein LOC284498Location: 1p36.22Chromosome: 1 Annotation: NC_000001.9 (11744430..11773197)GeneID: 284498
3: CCDC101
4: ABCG8
Official Symbol: ABCG8 and Name: ATP-binding cassette, sub-family G (WHITE), member 8 (sterolin 2) [Homo sapiens]Other Aliases: MGC142217, STSLOther Designations: ATP-binding cassette, subfamily G, member 8; sterolin 2Location: 2p21Chromosome: 2 Annotation: NC_000002.10 (43919606..43959108)MIM: 605460GeneID: 64241
5: SLCO1B1
Official Symbol: SLCO1B1 and Name: solute carrier organic anion transporter family, member 1B1 [Homo sapiens]Other Aliases: LST-1, MGC133282, OATP-C, OATP1B1, OATP2, SLC21A6Other Designations: solute carrier family 21 (organic anion transporter), member 6Location: 12pChromosome: 12 Annotation: NC_000012.10 (21175402..21283996)MIM: 604843GeneID: 10599
6: ABCA9
Official Symbol: ABCA9 and Name: ATP-binding cassette, sub-family A (ABC1), member 9 [Homo sapiens]Other Aliases: DKFZp686F2450, EST640918, MGC75415Other Designations: ATP-binding cassette A9; ATP-binding cassette, sub-family A, member 9Location: 17q24.2Chromosome: 17 Annotation: NC_000017.9 (64568730..64482367, complement)GeneID: 10350
7: ABCA10
Official Symbol: ABCA10 and Name: ATP-binding cassette, sub-family A (ABC1), member 10 [Homo sapiens]Other Aliases: EST698739Other Designations: ATP-binding cassette A10; ATP-binding cassette sub-family A member 10; ATP-binding cassette, sub-family A, member 10Location: 17q24Chromosome: 17 Annotation: NC_000017.9 (64752550..64655743, complement)GeneID: 10349
8: ABCC4
Official Symbol: ABCC4 and Name: ATP-binding cassette, sub-family C (CFTR/MRP), member 4 [Homo sapiens]Other Aliases: RP11-74A12.1, EST170205, MOAT-B, MOATB, MRP4Other Designations: ATP-binding cassette, sub-family C, member 4; bA464I2.1 (ATP-binding cassette, sub-family C (CFTR/MRP), member 4); canalicular multispecific organic anion transporter (ABC superfamily)Location: 13q32Chromosome: 13 Annotation: NC_000013.9 (94751683..94470089, complement)MIM: 605250GeneID: 10257
9: ABCG2
Official Symbol: ABCG2 and Name: ATP-binding cassette, sub-family G (WHITE), member 2 [Homo sapiens]Other Aliases: ABC15, ABCP, BCRP, BCRP1, BMDP, CDw338, EST157481, MGC102821, MRX, MXR, MXR1Other Designations: ABC transporter; ATP-binding cassette sub-family G (WHITE) member 2; ATP-binding cassette transporter G2; ATP-binding cassette, sub-family G, member 2; breast cancer resistance protein; mitoxantrone resistance protein; placenta specific MDR proteinLocation: 4q22Chromosome: 4 Annotation: NC_000004.10 (89299034..89230439, complement)MIM: 603756GeneID: 9429
10: ABCC3
Official Symbol: ABCC3 and Name: ATP-binding cassette, sub-family C (CFTR/MRP), member 3 [Homo sapiens]Other Aliases: ABC31, EST90757, MLP2, MOAT-D, MRP3, cMOAT2Other Designations: ATP-binding cassette, sub-family C, member 3; canalicular multispecific organic anion transporter; multidrug resistance
DME genes

11. **UGT2B7**
   - Official Symbol: UGT2B7
   - Name: UDP glucuronosyltransferase 2 family, polypeptide B7
   - Other Aliases: UGT2B9
   - Other Designations: UDP glucosyltransferase 2 family, polypeptide B7; UDP-glucuronosyltransferase 2B7; UDP-glucuronyltransferase, family 2, beta-7
   - Location: 4q13
   - Chromosome: 4
   - Annotation: NC_000004.10 (18263352..18236520, complement)
   - MIM: 187680
   - GeneID: 7172

12. **TPMT**
   - Official Symbol: TPMT
   - Name: thiopurine S-methyltransferase
   - Other Designations: S-adenosyl-L-methionine:thiopurine S-methyltransferase; thiopurine methyltransferase
   - Location: 6p22.3
   - Chromosome: 6
   - Annotation: NC_000006.10 (69996813..70013292)
   - MIM: 600068
   - GeneID: 7364

13. **SULT1A1**
   - Official Symbol: SULT1A1
   - Name: sulfotransferase family, cytosolic, 1A, phenol-prefering, member 1
   - Other Aliases: HASt1/HAST2, MGC131921, MGC5163, P-PST, PST, ST1A3, STP, STP1, TSPST1
   - Other Designations: aryl sulfotransferase; phenol-prefering phenol sulfotransferase1; phenol-sulfating phenol sulfotransferase; thermostable phenol sulfotransferase
   - Location: 16p12.1
   - Chromosome: 16
   - Annotation: NC_000016.8 (28542366..28524413, complement)
   - MIM: 171150
   - GeneID: 6817

14. **SULT1A2**
   - Official Symbol: SULT1A2
   - Name: sulfotransferase family, cytosolic, 1A, phenol-prefering, member 2
   - Other Aliases: HASt4, MGC142287, MGC142289, P-PST, ST1A2, STP2, TSPST2
   - Other Designations: aryl sulfotransferase; phenol-prefering phenol sulfotransferase2; phenol-sulfating phenol sulfotransferase 2; phenolic-metabolizing (P) form of PST; thermostable phenol sulfotransferase
   - Location: 16p12.1
   - Chromosome: 16
   - Annotation: NC_000016.8 (28515891..28510766, complement)
   - MIM: 601292
   - GeneID: 6799

15. **SLC19A1**
   - Official Symbol: SLC19A1
   - Name: solute carrier family 19 (folate transporter), member 1
   - Other Aliases: CHMD, FOLT, IFC1, REFC
   - Other Designations: reduced folate carrier; solute carrier family 19 member 1
   - Location: 21q22.3
   - Chromosome: 21
   - Annotation: NC_000021.7 (45786778..45759056, complement)
   - MIM: 600424
   - GeneID: 6573

16. **ABCB4**
   - Official Symbol: ABCB4
   - Name: ATP-binding cassette, sub-family B (MDR/TAP), member 4
   - Other Aliases: ABC21, GBD1, MDR2, MDR2/3, MDR3, PFIC-3
   - Other Designations: ATP-binding cassette, subfamily B, member 4; P glycoprotein 3/multiple drug resistance 3; P-glycoprotein-3/multiple drug resistance-3; multidrug resistance protein 3; multiple drug resistance 3
   - Location: 7q21.1
   - Chromosome: 7
   - Annotation: NC_00007.12 (86947683..86869296, complement)
   - MIM: 604244
   - GeneID: 6573

17. **NT5E**
   - Official Symbol: NT5E
   - Name: 5'-nucleotidase, ecto (CD73)
   - Other Aliases: RP11-321N4.1, CD73, E5NT, NT, NT5, NTE, eN, eNT
   - Other Designations: 5' nucleotidase (CD73); 5' nucleotidase, ecto; OTTHUMP0000040565; Purine 5-Prime-Nucleotidase; ecto-5'-nucleotidase
   - Location: 6q14-q21
   - Chromosome: 6
   - Annotation: NC_000006.10 (86261556..86262214)
   - MIM: 129190
   - GeneID: 4907

18. **MTHFR**
   - Official Symbol: MTHFR
   - Name: 5,10-methylenetetrahydrofolate reductase (NADPH)
   - Other Aliases: RP11-321N4.1, CD73, E5NT, NT, NT5, NTE, eN, eNT
   - Other Designations: 5' nucleotidase (CD73); 5' nucleotidase, ecto; OTTHUMP0000040565; Purine 5-Prime-Nucleotidase; ecto-5'-nucleotidase
   - Location: 1p36.3
   - Chromosome: 1
   - Annotation: NC_000001.9 (11788701..11788373, complement)
   - MIM: 607093
   - GeneID: 4524

19. **MSH3**
   - Official Symbol: MSH3
   - Name: mutS homolog 3 (E. coli)
   - Other Aliases: DUP, MGC163306, MGC163308, MRP1
   - Other Designations: Divergent upstream protein; Mismatch repair protein 1; mutS homolog 3
   - Location: 5q11-q12
   - Chromosome: 5
5 Annotation: NC_000005.8 (79986049..80208389)MIM: 600887 GeneID: 4437
20: ABCC1
Official Symbol: ABCC1 and Name: ATP-binding cassette, sub-family C (CFTR/MRP), member 1 [Homo sapiens]Other Aliases: ABC29, ABCC, DKFZp686N04233, DKFZp781G125, GS-X, MRP, MRP1Other Designations: ATP-binding cassette, sub-family C, member 1; LTC4 transporter; leukotriene C(4) transporter; multidrug resistance protein; multiple drug resistance protein 1; multiple drug resistance-associated proteinLocation: 16p13.1Chromosome: 16 Annotation: NC_000016.8 (15950934..16143773)MIM: 158343 GeneID: 4363
21: GSTT1
Official Symbol: GSTT1 and Name: glutathione S-transferase theta 1 [Homo sapiens]Location: 22q11.23Chromosome: 22 Annotation: NC_000022.9 (22714230..22706140, complement)MIM: 600436 GeneID: 2952
22: GSTP1
Official Symbol: GSTP1 and Name: glutathione S-transferase pi [Homo sapiens]Other Aliases: DFN7, FAEES3, GST3, P1Other Designations: deafness, X-linked 7; fatty acid ethyl ester synthase III; glutathione transferaseLocation: 11q13Chromosome: 11 Annotation: NC_000011.8 (67107861..67110698)MIM: 134660 GeneID: 2950
23: GSTM3
Official Symbol: GSTM3 and Name: glutathione S-transferase M3 (brain) [Homo sapiens]Other Aliases: GST5, GSTB, GSTM3-3, GTM3, MGC3310, MGC3704Other Designations: GST class-mu 3; S-(hydroxyalkyl)glutathione lyase M3; brain GST; glutathione S-alkyltransferase M3; glutathione S-aralkyltransferase M3; glutathione S-arylttransferase M3; glutathione S-transferase M3; glutathione S-transferase, Mu-3Location: 1p13.3Chromosome: 1 Annotation: NC_000011.9 (110084562..110078076, complement)MIM: 138390 GeneID: 2947
24: GSTA4
25: GSTA1
26: EPHX1
Official Symbol: EPHX1 and Name: epoxide hydrolase 1, microsomal (xenobiotic) [Homo sapiens]Other Aliases: EPHX, EPOX, MEHOther Designations: Epoxide hydrolase 1, microsomal (xenobiotic)Location: 1q42.1Chromosome: 1 Annotation: NC_000001.9 (224079598..224099883)MIM: 132810 GeneID: 2052
27: DPYD
Official Symbol: DPYD and Name: dihydropyrimidine dehydrogenase [Homo sapiens]Other Aliases: DHP, DPD, MGC132008, MGC70799Other Designations: OTTHUMP00000058954Location: 1p22Chromosome: 1 Annotation: NC_000001.9 (98159166..97315889, complement)MIM: 274270 GeneID: 1806
28: NQO1
Official Symbol: NQO1 and Name: NAD(P)H dehydrogenase, quinone 1 [Homo sapiens]Other Aliases: DHQU, DIA4, DTD, NMOR1, NMORI, QR1Other Designations: DT-diaphorase; NAD(P)H menadione oxidoreductase 1, dioxin-inducible; NAD(P)H:quinone acceptor oxidoreductase type 1; NAD(P)H:menadione oxidoreductase 1; NAD(P)H:quinone oxireductase; azoreductase; diaphorase (NADH/NADPH);
DME genes

29: DHFR  
Official Symbol: DHFR and Name: dihydrofolate reductase [Homo sapiens]  
Location: 5q11.2-q13.2  
Chromosome: 5  
Annotation: NC_000005.8 (79986555..79957800, complement)  
MIM: 126060  
GeneID: 1719

30: DCK  
Official Symbol: DCK and Name: deoxycytidine kinase [Homo sapiens]  
Other Aliases: MGC117410, MGC138632  
Location: 4q13.3-q21.1  
Chromosome: 4  
Annotation: NC_000004.10 (72078255..72115476)  
MIM: 125450  
GeneID: 1633

31: CYP17A1  
Official Symbol: CYP17A1 and Name: cytochrome P450, family 17, subfamily A, polypeptide 1 [Homo sapiens]  
Other Aliases: RP11-753C18.1, CPT7, P450C17, S17A  
Designations: cytochrome P450, family 17; cytochrome P450, subfamily XVII (steroid 17-alpha-hydroxylase), adrenal hyperplasia; cytochrome p450  
油耗: 10q24.3  
Chromosome: 10  
Annotation: NC_000010.9 (104587279..104580277, complement)  
MIM: 609300  
GeneID: 1586

32: CYP3A5  
Official Symbol: CYP3A5 and Name: cytochrome P450, family 3, subfamily A, polypeptide 5 [Homo sapiens]  
Other Aliases: CP35, P450PCN3, PCN3  
Designations: aryl hydrocarbon hydroxylase; cytochrome P-450; cytochrome P450, subfamily IIIA (niphedipine oxidase), polypeptide 5; flavoprotein-linked monoxygenase; microsomal monoxygenase; niphedipine oxidase; xenobiotic monoxygenase  
油耗: 7q21.1  
Chromosome: 7  
Annotation: NC_000007.12 (99115556..99083752, complement)  
MIM: 605325  
GeneID: 1576

33: CYP3A4  
Official Symbol: CYP3A4 and Name: cytochrome P450, family 3, subfamily A, polypeptide 4 [Homo sapiens]  
Other Aliases: CP33, CP34, CYP3A, CYP3A3, HLP, MGC126680, NF-25, P450C3, P450PCN1  
Designations: aryl hydrocarbon hydroxylase; cytochrome P-450; cytochrome P450, subfamily IIIA (niphedipine oxidase), polypeptide 3; cytochrome P450, subfamily IIIA, polypeptide 4; cytochrome P450, subfamily IIIA, polypeptide 4; glucocorticoid-inducible P450; niphedipine oxidase  
油耗: 7q21.1  
Chromosome: 7  
Annotation: NC_000007.12 (99219743..99192539, complement)  
MIM: 605325  
GeneID: 1576

34: CYP2E1  
Official Symbol: CYP2E1 and Name: cytochrome P450, family 2, subfamily E, polypeptide 1 [Homo sapiens]  
Other Aliases: CPE1, CYP2E, P450-J, P450C2EOther Designations: OTTHUMP00000046571; cytochrome P450 2E1; cytochrome P450, subfamily IIE (ethanol-inducible); cytochrome P450, subfamily IIE (ethanol-inducible), polypeptide 1; flavoprotein-linked monoxygenase; microsomal monoxygenase; putative cytochrome P450 2E1; xenobiotic monoxygenase  
油耗: 10q24.3-pter  
Chromosome: 10  
Annotation: NC_000010.9 (135190856..135202609)  
MIM: 124040  
GeneID: 1571

35: CYP2D6  
Official Symbol: CYP2D6 and Name: cytochrome P450, family 2, subfamily D, polypeptide 6 [Homo sapiens]  
Other Aliases: RP4-669P10.2, CPD6, CYP2D, CYP2D@, CYP2DL1, MGC120389, MGC120390, P450-DB1, P450C2DOther Designations: cytochrome P450 2D6; cytochrome P450, subfamily IID (debrisoquine, sparteine, etc., -metabolizing), polypeptide 6; cytochrome P450, subfamily IID (debrisoquine, sparteine, etc., -metabolizing)-like 1; debrisoquine 4-hydroxylase; flavoprotein-linked monoxygenase; microsomal monoxygenase; xenobiotic monoxygenase  
油耗: 22q13.1  
Chromosome: 22  
Annotation: NC_000022.9 (40856826..40852444, complement)  
MIM: 124030  
GeneID: 1565

36: CYP2C18  
Official Symbol: CYP2C18 and Name: cytochrome P450, family 2, subfamily C, polypeptide 18 [Homo sapiens]  
Other Aliases: RP11-466J14.4, CPCI, CYP2C, CYP2C17, DME genes
DME genes

DKFZp686I24235, P450-6B/29C, P450IIC17
Other Designations: (S)-mephenytoin hydroxylase associated cytochrome P450; cytochrome P450, subfamily IIC (mephenytoin 4-hydroxylase), polypeptide 17; cytochrome P450, subfamily IIC (mephenytoin 4-hydroxylase), polypeptide 18; flavoprotein-linked monooxygenase; microsomal monooxygenase; unspecific monooxygenase
Location: 10q24
Chromosome: 10
Annotation: NC_000010.9 (96433367..96485513)MIM: 601131GeneID: 1562

37: CYP2C9
Official Symbol: CYP2C9 and Name: cytochrome P450, family 2, subfamily C, polypeptide 9 [Homo sapiens]Other Aliases: CPC9, CYP2C, CYP2C10, MGC149605, MGC88320, P450 MP-4, P450 PB-1, P450IIC9
Other Designations: cytochrome P-450 S-mephenytoin 4-hydroxylase; cytochrome P450, subfamily IIC (mephenytoin 4-hydroxylase), polypeptide 8; flavoprotein-linked monooxygenase; microsomal monooxygenase; s-mephenytoin 4-hydroxylase; xenobiotic monooxygenase
Location: 10q24
Chromosome: 10
Annotation: NC_000010.9 (96688429..96739136)MIM: 601130GeneID: 1559

38: CYP2C8
Official Symbol: CYP2C8 and Name: cytochrome P450, family 2, subfamily C, polypeptide 8 [Homo sapiens]Other Aliases: CPC8, P450 MP-12/MP-20
Other Designations: P450 form 1; cytochrome P450, subfamily IIC (mephenytoin 4-hydroxylase), polypeptide 8; flavoprotein-linked monooxygenase; microsomal monooxygenase; s-mephenytoin 4-hydroxylase; xenobiotic monooxygenase
Location: 10q23.33
Chromosome: 10
Annotation: NC_000010.9 (96819171..96786518, complement)MIM: 601129GeneID: 1558

39: CYP2C19
Other Designations: OTTHUMP00000059588; S-mephenytoin 4-hydroxylase; cytochrome P-450 II C; cytochrome P450, subfamily IIC (mephenytoin 4-hydroxylase), polypeptide 19; flavoprotein-linked monooxygenase; mephenytoin 4'-hydroxylase; microsomal monooxygenase; xenobiotic monooxygenase
Location: 10q24.1-q24.3
Chromosome: 10
Annotation: NC_000010.9 (96512452..96602660)MIM: 124020GeneID: 1557

40: CYP2A6
Official Symbol: CYP2A6 and Name: cytochrome P450, family 2, subfamily A, polypeptide 6 [Homo sapiens]Other Aliases: CPA6, CYP2A, CYP2A3, P450C2A, P450PBOther Designations: coumarin 7-hydroxylase; cytochrome P450, subfamily IIA (phenobarbital-inducible), polypeptide 3; cytochrome P450, subfamily IIA (phenobarbital-inducible), polypeptide 6; flavoprotein-linked monooxygenase; xenobiotic monooxygenase
Location: 19q13.2
Chromosome: 19
Annotation: NC_000019.8 (46048179..46041283, complement)MIM: 122720GeneID: 1548

41: CYP1B1
Official Symbol: CYP1B1 and Name: cytochrome P450, family 1, subfamily B, polypeptide 1 [Homo sapiens]Other Aliases: CP1B, GLC3A
Other Designations: aryl hydrocarbon hydroxylase; cytochrome P450, subfamily I (dioxin-inducible), polypeptide 1 (glaucoma 3, primary infantile); flavoprotein-linked monooxygenase; microsomal monooxygenase; xenobiotic monooxygenase
Location: 2p21
Chromosome: 2
Annotation: NC_000002.10 (38156795..38148249, complement)MIM: 601771GeneID: 1545

42: CYP1A2
Official Symbol: CYP1A2 and Name: cytochrome P450, family 1, subfamily A, polypeptide 2 [Homo sapiens]Other Aliases: CP12, P3-450, P450(PA)
Other Designations: P450 form 4; aryl hydrocarbon hydroxylase; cytochrome P450, subfamily I (aromatic compound-inducible), polypeptide 2; dioxin-inducible P3-450; flavoprotein-linked monooxygenase; microsomal monooxygenase; xenobiotic monooxygenase
Location: 15q24
Chromosome: 15
Annotation: NC_000015.8 (7282836..72835993)MIM: 124060GeneID: 1544

43: CYP1A1
Official Symbol: CYP1A1 and Name: cytochrome P450, family 1, subfamily A,
polypeptide 1 [Homo sapiens]Other Aliases: AHH, AHRR, CP11, CYP1, P1-450, P450-C, P450DXOther Designations: aryl hydrocarbon hydroxylase; cytochrome P1-450, dioxin-inducible; cytochrome P450 1A1; cytochrome P450, subfamily I (aromatic compound-inducible), polypeptide 1; flavoprotein-linked monoxygenase; xenobiotic monoxygenaseLocation: 15q22-q24Chromosome: 15 Annotation: NC_000015.8 (72804928..72798942, complement)MIM: 108330GeneID: 1543

44: ABCC2
Official Symbol: ABCC2 and Name: ATP-binding cassette, sub-family C (CFTR/MRP), member 2 [Homo sapiens]Other Aliases: ABC30, CMOAT, DJS, KIAA1010, MRP2, cMRPOther Designations: canalicular multispecific organic anion transporterLocation: 10q24Chromosome: 10 Annotation: NC_000010.9 (101532560..101601570)MIM: 601107GeneID: 1244

45: AHR

46: ABCA3
Official Symbol: ABCA3 and Name: ATP-binding cassette, sub-family A (ABC1), member 3 [Homo sapiens]Other Aliases: ABC-C, ABC3, EST111653, LBM180, MGC72201, SMDP3Other Designations: ABC transporter 3; ATP-binding cassette 3; ATP-binding cassette, sub-family A member 3Location: 16p13.3Chromosome: 16 Annotation: NC_000016.8 (2330594..2265882, complement)MIM: 601615GeneID: 21

47: ABCA2
Official Symbol: ABCA2 and Name: ATP-binding cassette, sub-family A (ABC1), member 2 [Homo sapiens]Other Aliases: ABC2, MGC129761Other Designations: ATP-binding cassette, sub-family A, member 2; OTTHUMP00000064733Location: 9q34Chromosome: 9 Annotation: NC_00009.10 (139043194..139021506, complement)MIM: 600047GeneID: 20

48: ABCA1
Official Symbol: ABCA1 and Name: ATP-binding cassette, sub-family A (ABC1), member 1 [Homo sapiens]Other Aliases: ABC-1, ABC1, CERP, FLJ14958, HDLDT1, TGDOther Designations: ATP binding cassette transporter 1; ATP-binding cassette 1; ATP-binding cassette transporter-1; ATP-binding cassette, sub-family A member 1; cholesterol efflux regulatory protein; high density lipoprotein deficiency, Tangier type, 1; membrane-boundLocation: 9q31.1Chromosome: 9 Annotation: NC_00009.10 (106730256..106583103, complement)MIM: 600046GeneID: 19

49: NAT2
Official Symbol: NAT2 and Name: N-acetyltransferase 2 (arylamine N-acetyltransferase) [Homo sapiens]Other Aliases: AAC2Other Designations: Arylamine N-acetyltransferase-2; arylamide acetylase 2; arylamide acetylase 2 (N-acetyltransferase 2, isoniazid inactivation); arylamine N-acetyltransferase 2Location: 8p22Chromosome: 8 Annotation: NC_000008.9 (18293034..18302961)MIM: 243400GeneID: 10

50: NAT1
Official Symbol: NAT1 and Name: N-acetyltransferase 1 (arylamine N-acetyltransferase) [Homo sapiens]Other Aliases: AAC1, NATIOther Designations: N-acetyltransferase 1; arylamide acetylase 1 (N-acetyltransferase 1); arylamine N-acetyltransferase 1Location: 8p23.1-p21.3Chromosome: 8 Annotation: NC_000008.9 (18111894..18125099)MIM: 108345GeneID: 9

51: VKORC1
Official Symbol: VKORC1 and Name: vitamin K epoxide reductase complex, subunit 1 [Homo sapiens]Other Aliases: EDTP308, FLJ00289, IMAGE3455200, MGC2694, MST134, MST576, VKCFD2, VKOROther Designations: Vitamin K-dependent clotting factors, combined deficiency of; 2; phylloquinone epoxide reductase; vitamin K dependent clotting factors deficiency 2; vitamin K1 epoxide reductase (warfarin-sensitive)Location: 16p11.2Chromosome: 16 Annotation: NC_000016.8 (31013776..31009675, complement)MIM: 608547GeneID: 79001

DME genes
**INF genes**

1: **ICOS**
   - Official Symbol: ICOS and Name: inducible T-cell co-stimulator [Homo sapiens]
   - Other Aliases: AILIM, CD278, MGC39850
   - Other Designations: activation-inducible lymphocyte immunomediatory molecule; inducible costimulator
   - Location: 2q33
   - Chromosome: 2
   - Annotation: NC_000002.10 (204509747..204534544)
   - MIM: 604558
   - GeneID: 29851

2: **CXCL13**
   - Official Symbol: CXCL13 and Name: chemokine (C-X-C motif) ligand 13 (B-cell chemoattractant) [Homo sapiens]
   - Other Aliases: ANGIE, ANGIE2, BCA-1, BCA1, BLC, BLR1L, SCYB13
   - Other Designations: B-cell-homing chemokine (ligand for Burkitt's lymphoma receptor-1); small inducible cytokine B subfamily (Cys-X-Cys motif), member 13 (B-cell chemoattractant)
   - Location: 4q21
   - Chromosome: 4
   - Annotation: NC_000004.10 (78651930..78752009)
   - MIM: 605149
   - GeneID: 10563

3: **SH2D2A**
   - Official Symbol: SH2D2A and Name: SH2 domain protein 2A [Homo sapiens]
   - Other Aliases: F2771, TSAd
   - Other Designations: T cell specific adapter protein TSAd; T cell specific adapter protein TSAd; T lymphocyte specific adaptor protein
   - Location: 1q21
   - Chromosome: 1
   - Annotation: NC_000001.9 (155053225..155042658, complement)
   - MIM: 604514
   - GeneID: 9047

4: **IL1R2**
   - Official Symbol: IL1R2 and Name: interleukin 1 receptor, type II [Homo sapiens]
   - Other Aliases: CD121b, IL1RB, MGC47725
   - Other Designations: antigen CDw121b; type II interleukin-1 receptor, beta
   - Location: 2q12-q22
   - Chromosome: 2
   - Annotation: NC_000002.10 (101974737..102011316)
   - MIM: 147811
   - GeneID: 7850

5: **TNFRSF1B**
   - Official Symbol: TNFRSF1B and Name: tumor necrosis factor receptor superfamily, member 1B [Homo sapiens]
   - Other Aliases: CD120b, TBPII, TNF-R-II, TNF-R75, TNFBR, TNFR2, TNFR80, p75, p75TNFR
   - Other Designations: tumor necrosis factor beta receptor; tumor necrosis factor binding protein 2; tumor necrosis factor receptor 2
   - Location: 1p36.3-p36.2
   - Chromosome: 1
   - Annotation: NC_000001.9 (12149646..12191863)
   - MIM: 191191
   - GeneID: 7133

6: **TNFRSF1A**
   - Official Symbol: TNFRSF1A and Name: tumor necrosis factor receptor superfamily, member 1A [Homo sapiens]
   - Other Aliases: CD120a, FPF, MGC19588, TBP1, TNF-R, TNF-R-I, TNF-R55, TNFAR, TNFR1, TNFR55, TNFR60, p55, p55-R, p60
   - Other Designations: tumor necrosis factor binding protein 1; tumor necrosis factor receptor 1; tumor necrosis factor receptor type 1; tumor necrosis factor-alpha receptor
   - Location: 12p13.2
   - Chromosome: 12
   - Annotation: NC_000012.10 (6321521..6308183, complement)
   - MIM: 191190
   - GeneID: 7132

7: **TNF**
   - Official Symbol: TNF and Name: tumor necrosis factor (TNF superfamily, member 2) [Homo sapiens]
   - Other Aliases: DASS-280D8.2, DIF, TNF-alpha, TNFA, TNFSF2
   - Other Designations: APC1 protein; OTTHUMP00000037669; TNF superfamily, member 2; TNF, macrophage-derived; TNF, monocyte-derived; cachectin; tumor necrosis factor alpha
   - Location: 6p21.3
   - Chromosome: 6
   - Annotation: NC_000006.10 (31651328..31654090)
   - MIM: 191160
   - GeneID: 7124

8: **TGFBR2**
   - Official Symbol: TGFBR2 and Name: transforming growth factor, beta receptor II (70/80kDa) [Homo sapiens]
   - Other Aliases: AAT3, FAA3, MFS2, RIIC, TAAD2, TGFBR-2, TGFbeta-RIOther Designations: TGF-beta receptor type II; transforming growth factor beta receptor type II; transforming growth factor, beta receptor II; transforming growth factor, beta receptor II
   - Location: 3p22
   - Chromosome: 3
   - Annotation: NC_000003.10 (30622997..30710637)
   - MIM: 190182
   - GeneID: 7048

9: **TGFBR1**
   - Official Symbol: TGFBR1 and Name: transforming growth factor, beta receptor I (activin A receptor type II-like kinase, 53kDa) [Homo sapiens]
   - Other Aliases:
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cytokine A2; small inducible cytokine A2 (monocyte chemotactic protein 1, homologous to mouse Sig-je); small inducible cytokine subfamily A (Cys-Cys), member 2Location: 17q11.2-q12Chromosome: 17 Annotation: NC_000017.9 (29606408..29608334)MIM: 158105GeneID: 6347
18: PTPRC
Official Symbol: PTPRC and Name: protein tyrosine phosphatase, receptor type, C [Homo sapiens]Other Aliases: B220, CD45, GP180, LCA, LY5, T200Other Designations: CD45 antigen; SCID due to PTPRC deficiency; T200 glycoprotein; T200 leukocyte common antigen; glycoprotein; human homolog of severe combined immunodeficiency due to PTPRC deficiency; leukocyte-common antigen; protein tyrosine phosphatase, receptor type, c polypeptideLocation: 17q22-q23.2Chromosome: 17 Annotation: NC_000017.9 (19687487..19699295)MIM: 151460GeneID: 5788
19: PRKCA
20: PECAM1
Official Symbol: PECAM1 and Name: platelet/endothelial cell adhesion molecule (CD31 antigen) [Homo sapiens]Other Aliases: CD31, PECAM-1Other Designations: CD31/EndoCAM; PECAM-1, CD31/EndoCAM; adhesion moleculeLocation: 17q22-q23.2Chromosome: 17 Annotation: NC_000017.9 (29606408..29608334)MIM: 176960GeneID: 5578
21: OTC
22: NTRK1
Official Symbol: NTRK1 and Name: neurotrophic tyrosine kinase, receptor, type 1 [Homo sapiens]Other Aliases: DKFZp781114186, MTC, TRK, TRK1, TRKA, p140-TrkAOther Designations: Oncogene TRK; high affinity nerve growth factor receptor; tyrosine kinase receptor; tyrosine kinase receptor ALocation: 1q21-q22Chromosome: 1 Annotation: NC_000017.9 (155052165..155118265)MIM: 191315GeneID: 4914
23: MIF
Official Symbol: MIF and Name: macrophage migration inhibitory factor (glycosylation-inhibiting factor) [Homo sapiens]Other Aliases: GIF, GLIF, MMIFOther Designations: glycosylation-inhibiting factor; phenylpyruvate tautomeraseLocation: 22q11.23Chromosome: 22 Annotation: NC_000022.9 (22566564..22567408)MIM: 153620GeneID: 4282
24: LAG3
25: ITGB3
Official Symbol: ITGB3 and Name: integrin, beta 3 (platelet glycoprotein Ila, antigen CD61) [Homo sapiens]Other Aliases: CD61, GP3A, GPlIaOther Designations: integrin beta chain, beta 3; platelet glycoprotein IlaLocation: 17q21.32Chromosome: 17 Annotation: NC_000017.9 (42686206..42745075)MIM: 173470GeneID: 3690
26: ITGA4
Official Symbol: ITGA4 and Name: integrin, alpha 4 (antigen CD49D, alpha 4 subunit of VLA-4 receptor) [Homo sapiens]Other Aliases: CD49D, IA4, MGC90518Other Designations: 269C wild type; antigen CD49D, alpha-4 subunit of VLA-4 receptor; integrin alpha 4; integrin alpha-4 subunit; very late activation protein 4 receptor; alpha 4 subunitLocation: q31.3Chromosome: 2 Annotation: NC_000002.10 (182029863..182110718)MIM: 192975GeneID: 3676
27: ITGA2
Official Symbol: ITGA2 and Name: integrin, alpha 2 (CD49B, alpha 2 subunit of
VLA-2 receptor) [Homo sapiens]Other Aliases: BR, CD49B, GPIa, VLA-2, VLA2
Other Designations: integrin alpha 2; platelet antigen Br; platelet glycoprotein GPIa;
platelet glycoprotein la; very late activation protein 2 receptor, alpha-2
subunitLocation: 5q23-q31Chromosome: 5 Annotation: NC_000005.8
(52321013..52423946)MIM: 192974GeneID: 3673
28: CXCL10
Official Symbol: CXCL10 and Name: chemokine (C-X-C motif) ligand 10 [Homo
sapiens]Other Aliases: C7, IFI10, INP10, IP-10, SCYB10, crg-2, gIP-10,
moi-10Other Designations: gamma IP10; interferon-inducible cytokine IP-10;
protein 10 from interferon (gamma)-induced cell line; small inducible cytokine
B10; small inducible cytokine subfamily B (Cys-X-Cys), member 10Location:
4q21Chromosome: 4 Annotation: NC_000004.10 (77163673..77161296, complement)MIM:
147310GeneID: 3627
29: IL18
Official Symbol: IL18 and Name: interleukin 18 (interferon-gamma-inducing
factor) [Homo sapiens]Other Aliases: IGIF, IL-18, IL-1g, IL1F4, MGC12320
Other Designations: IL-1 gamma; interferon-gamma-inducing factor; interleukin 18;
interleukin-1 gamma; interleukin-18Location: 11q22.2-q22.3Chromosome: 11
Annotation: NC_000011.8 (111540049..111519185, complement)MIM:
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30: IL12RB2
Official Symbol: IL12RB2 and Name: interleukin 12 receptor, beta 2 [Homo
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interleukin 12 receptor, beta 2 (IL12RB2); interleukin-12 receptor beta-2
chainLocation: 1p31.3-p31.2Chromosome: 1 Annotation: NC_000001.9
(67545634..67635170)MIM: 601642GeneID: 3595
31: IL12RB1
Official Symbol: IL12RB1 and Name: interleukin 12 receptor, beta 1 [Homo
sapiens]Other Aliases: CD212, IL-12R-BETA1, IL12RB, MGC34454
Other Designations: interleukin-12 receptor beta component; interleukin-12 receptor beta-1
chainLocation: 19p13.1Chromosome: 19 Annotation: NC_000019.8 (18058696..18031370,
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32: IL12B
Official Symbol: IL12B and Name: interleukin 12B (natural killer cell
stimulatory factor 2, cytotoxic lymphocyte maturation factor 2, p40) [Homo
sapiens]Other Aliases: CLMF, CLMF2, IL-12B, NKSF, NKSF2
Other Designations: IL12 subunit p40; cytotoxic lymphocyte maturation factor 2, p40;
interleukin 12, p40; interleukin 12B; interleukin-12 beta chain; natural killer cell stimulatory
factor, 40 kD subunit; natural killer cell stimulatory factor-2Location:
5q31.1-q33.1Chromosome: 5 Annotation: NC_000005.8 (158690058..158674368,
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33: IL12A
Official Symbol: IL12A and Name: interleukin 12A (natural killer cell
stimulatory factor 1, cytotoxic lymphocyte maturation factor 1, p35) [Homo
sapiens]Other Aliases: CLMF, IL-12A, NFSK, NKSF1, p35
Other Designations: IL-12, subunit p35; NF cell stimulatory factor chain 1; cytotoxic lymphocyte maturation
factor 1, p35; interleukin 12, p35; interleukin 12A; interleukin-12 alpha chain;
natural killer cell stimulatory factor 1, 35 kD subunitLocation:
3q25.33-q26Chromosome: 3 Annotation: NC_000003.10 (161189322..161196499)MIM:
161560GeneID: 3592
34: IL10RB
Official Symbol: IL10RB and Name: interleukin 10 receptor, beta [Homo
sapiens]Other Aliases: CDW210B, CRF2-4, CRF34, D21558, D21666, IL-10R2
Other Designations: cytokine receptor class-II CRF2-4; cytokine receptor family II,
member 4Location: 21q22.11Chromosome: 21 Annotation: NC_000021.7
(33560541..33591389)MIM: 123889GeneID: 3588
35: IL10

INF genes
Official Symbol: IL10 and Name: interleukin 10 [Homo sapiens]
Other Aliases: CSF1, IL-10, IL10A, MGC126450, MGC126451, TGF
Other Designations: cytokine synthesis inhibitory factor
Location: 1q31-q32
Chromosome: 1
Annotation: NC_000001.9 (205012461..205007570, complement)
MIM: 124092
GeneID: 3586

36: IL8
Official Symbol: IL8 and Name: interleukin 8 [Homo sapiens]
Other Aliases: 3-10C, AMCF-I, CXCL8, GCP-1, GCP1, K60, LECT, LUCT, LYNAP, MDNCF, MONAP, NAF, NAP-1, NAP1, SCYB8, TSG-1, b-ENA
Other Designations: cytokine synthesis inhibitory factor; beta-thromboglobulin-like protein; chemokine (C-X-C motif) ligand 8; emoctakin; granulocyte chemotactic protein 1; lymphocyte-derived neutrophil-activating factor; monocyte derived neutrophil-activating protein; monocyte-derived neutrophil chemotactic factor; neutrophil-activating peptide 1; small inducible cytokine subfamily B, member 8
Location: 4q13-q21
Chromosome: 4
Annotation: NC_000004.10 (74825138..74828296)
MIM: 146930
GeneID: 3576

37: IL7R
Official Symbol: IL7R and Name: interleukin 7 receptor [Homo sapiens]
Other Aliases: CD127, CDW127, IL-7R-alpha
Other Designations: CD127 antigen; interleukin 7 receptor alpha chain
Location: 5p13
Chromosome: 5
Annotation: NC_000005.8 (35892747..35912680)
MIM: 146661
GeneID: 3575

38: IL6
Official Symbol: IL6 and Name: interleukin 6 (interferon, beta 2) [Homo sapiens]
Other Aliases: BSF2, HGF, HSF, IFNB2, IL-6
Location: 7p21
Chromosome: 7
Annotation: NC_000007.12 (22733344..22738140)
MIM: 147620
GeneID: 3569

39: IL4R
Official Symbol: IL4R and Name: interleukin 4 receptor [Homo sapiens]
Other Aliases: CD124, IL4RA
Other Designations: interleukin 4 receptor alpha chain; interleukin-4 receptor alpha chain
Location: 16p12.1-p11.2
Chromosome: 16
Annotation: NC_000016.8 (27232751..27283599)
MIM: 147781
GeneID: 3566

40: IL2RB
Official Symbol: IL2RB and Name: interleukin 2 receptor, beta [Homo sapiens]
Other Aliases: CD122, P70-75
Other Designations: CD122 antigen; OTTHUMP00000028799; high affinity IL-2 receptor beta subunit; interleukin 2 receptor beta
Location: 1p13.1
Chromosome: 1
Annotation: NC_000001.12 (22733344..22738140)
MIM: 147620
GeneID: 3560

41: IL2
Official Symbol: IL2 and Name: interleukin 2 [Homo sapiens]
Other Aliases: IL-2, TCGF, lymphokine
Other Designations: T cell growth factor; aldesleukin; interleukin-2; involved in regulation of T-cell clonal expansion
Location: 4q26-q27
Chromosome: 4
Annotation: NC_000004.10 (123597329..123592074, complement)
MIM: 147680
GeneID: 3558

42: IL1R1
Official Symbol: IL1R1 and Name: interleukin 1 receptor, type I [Homo sapiens]
Other Aliases: CD121A, D251473, IL-1R-alpha, IL1R, IL1RA, P80
Other Designations: antigen CD121a; interleukin 1 receptor alpha, type I; interleukin receptor 1
Location: 2q12
Chromosome: 2
Annotation: NC_000002.10 (102136833..102162765)
MIM: 147810
GeneID: 3554

43: IL1B
Official Symbol: IL1B and Name: interleukin 1, beta [Homo sapiens]
Other Aliases: IL-1, IL1-BETA, IL1F2
Other Designations: catabolin; preinterleukin 1 beta; pro-interleukin-1-beta
Location: 2q14
Chromosome: 2
Annotation: NC_000002.10 (113310826..113303807, complement)
MIM: 147720
GeneID: 3553

44: IL1A
Official Symbol: IL1A and Name: interleukin 1, alpha [Homo sapiens]
Other Aliases: IL-1A, IL1, IL1-ALPHA, IL1F1
Other Designations: antigen CD121a; interleukin 1 alpha; pro-interleukin-1-alpha
Location: 2q14
Chromosome: 2
Annotation: NC_000002.10 (113259441..113247962, complement)
MIM: 147760
GeneID: 3552

45: IFNGR2
Official Symbol: IFNGR2 and Name: interferon gamma receptor 2 (interferon gamma
INF genes

46: IFNG

47: IFNAR2
Official Symbol: IFNAR2 and Name: interferon (alpha, beta and omega) receptor 2 [Homo sapiens] Other Aliases: IFN-R, IFN-alpha-REC, IFNABR, IFNARB Other Designations: human interferon alpha/beta receptor; interferon alpha/beta receptor 2; interferon-alpha/beta receptor beta chain; type I interferon receptor Location: 21q22.11 Chromosome: 21 Annotation: NC_000021.7 (33524100..33558696) MIM: 602376 GeneID: 3455

48: IFNAR1
Official Symbol: IFNAR1 and Name: interferon (alpha, beta and omega) receptor 1 [Homo sapiens] Other Aliases: AVP, IFN-alpha-REC, IFNAR, IFNBR, IFRC Other Designations: alpha-type antiviral protein; beta-type antiviral protein; interferon-alpha receptor 1; interferon-alpha/beta receptor alpha chain; interferon-beta receptor 1 Location: 21q22.11 Chromosome: 21 Annotation: NC_000021.7 (33619083..33653998) MIM: 107450 GeneID: 3454

49: ICAM4

50: ICAM2

51: ICAM1
Official Symbol: ICAM1 and Name: intercellular adhesion molecule 1 (CD54), human rhinovirus receptor [Homo sapiens] Other Aliases: BB2, CD54, P3.58 Other Designations: 60 bp after segment 1; cell surface glycoprotein; cell surface glycoprotein P3.58; intercellular adhesion molecule 1 Location: 19p13.3-p13.2 Chromosome: 19 Annotation: NC_000019.8 (10242778..10258290) MIM: 147840 GeneID: 3383

52: HLA-DRB4
Official Symbol: HLA-DRB4 and Name: major histocompatibility complex, class II, DR beta 4 [Homo sapiens] Other Aliases: DASS-233C19.2, DRB4, HLA DRB1, HLA-DR4B, HLA-DRB1 Other Designations: DRB1 transplantation antigen; HLA DRB1*1202; MHC HLA DR-beta chain; MHC class II HLA-DR-beta-7; MHC class II antigen; MHC class II antigen HLA-DR-beta; MHC class II antigen HLA-DRB1; MHC class2 antigen; class II histocompatibility antigen HLA DR alpha, beta1-0307; human leucocyte antigen DRB4; leucocyte antigen DRB1; leucocyte antigen; major histocompatibility complex, class II, DR beta 1 Chromosome: 6; Location: 6p21.3 GeneID: 3126

53: HLA-DRB3
Official Symbol: HLA-DRB3 and Name: major histocompatibility complex, class II, DR beta 3 [Homo sapiens] Other Aliases: HLA-DR3B, MGCl173300 Other Designations: MHC class II HLA-DR beta 3 chain; MHC class II antigen DR beta 3 chain; human leucocyte antigen DRB3 Chromosome: 6; Location: 6p21.3 GeneID: 3125

54: HLA-DRB1
Official Symbol: HLA-DRB1 and Name: major histocompatibility complex, class II, DR beta 1 [Homo sapiens] Other Aliases: XXbac-BPG161M6.1, DR1B, HLA DRB1, HLA-DR1B, HLA-DRB1* Other Designations: HLA class II antigen beta chain; HLA...
class II histocompatibility antigen, DR-1 beta chain; MHC class II HLA-DR beta 1 chain; MHC class II HLA-DR-beta cell surface glycoprotein; human leucocyte antigen DRB1; lymphocyte antigen DRB1Location: 6p21.3Chromosome: 6 Annotation: NC_000006.10 (32665558..32654526, complement)MIM: 142857GeneID: 3123

55: HLA-DRA

Official Symbol: HLA-DRA and Name: major histocompatibility complex, class II, DR alpha [Homo sapiens]Other Aliases: HLA-DRA1Other Designations: HLA class II histocompatibility antigen, DR alpha chain; MHC cell surface glycoprotein; histocompatibility antigen HLA-DR alphaLocation: 6p21.3Chromosome: 6 Annotation: NC_000006.10 (32515624..32520800)MIM: 142860GeneID: 3122

56: FGFR1

Official Symbol: FGFR1 and Name: fibroblast growth factor receptor 1 (fms-related tyrosine kinase 2, Pfeiffer syndrome) [Homo sapiens]Other Aliases: BFGFR, CD331, CEK, FGFR3, FLG, FLT2, HBGF3, KAL2, N-SAMOther Designations: FMS-like tyrosine kinase 2; basic fibroblast growth factor receptor 1; fibroblast growth factor receptor 1; fms-related tyrosine kinase-2; heparin-binding growth factor receptor; hydroxaryl-protein kinaseLocation: 8p11.2-p11.1Chromosome: 8 Annotation: NC_000008.9 (38445292..38389448, complement)MIM: 136350GeneID: 2260

57: EDG1

Official Symbol: EDG1 and Name: endothelial differentiation, sphingolipid G-protein-coupled receptor, 1 [Homo sapiens]Other Aliases: CHEDG1, D1S3362, ECGF1, EDG-1, S1PR1Other Designations: G protein-coupled sphingolipid receptor; sphingosine 1-phosphate receptor EDG1Location: 1p21Chromosome: 1 Annotation: NC_000001.9 (10147504..101479661)MIM: 601974GeneID: 1901

58: CTLA4


59: CCR6

Official Symbol: CCR6 and Name: chemokine (C-C motif) receptor 6 [Homo sapiens]Other Aliases: BN-1, CD196, CRK-L3, CRK6, CKLR3, CMKBR6, DCR2, DRY-6, GPR-CY4, GPR29, GPRCY4, STRL22Other Designations: G protein-coupled receptor 29; chemokine (C-C) receptor 6; chemokine receptor-like 3; seven-transmembrane receptor, lymphocyte, 22Location: 6q27Chromosome: 6 Annotation: NC_000006.10 (167456246..167476218)MIM: 601835GeneID: 1235

60: CD86

Official Symbol: CD86 and Name: CD86 molecule [Homo sapiens]Other Aliases: B7-2, B70, CD28LG2, LAB72, MGC34413Other Designations: B-lymphocyte activation antigen B7-2; B7-2 antigen; CD28 antigen ligand 2; CD86 antigen; CD86 antigen (CD28 antigen ligand 2, B7-2 antigen); CTLA-4 counter-receptor B7.2Location: 3q21Chromosome: 3 Annotation: NC_000003.10 (123256910..123322672)MIM: 601020GeneID: 942

61: CD80

Official Symbol: CD80 and Name: CD80 molecule [Homo sapiens]Other Aliases: CD28LG, CD28LG1, LAB7Other Designations: B-lymphocyte activation antigen B7; CD80 antigen (CD28 antigen ligand 1, B7-1 antigen); CD80 antigen precursor; costimulatory factor CD80; costimulatory molecule variant IgV-CD80Location: 3q13.3-q21Chromosome: 3 Annotation: NC_000003.10 (120761138..120725829, complement)MIM: 112203GeneID: 941

62: FASLG

Official Symbol: FASLG and Name: Fas ligand (TNF superfamily, member 6) [Homo sapiens]Other Aliases: APT1LG1, CD178, CD95L, FASL, TNFSF6Other Designations: CD95 ligand; apoptosis (APO-1) antigen ligand 1; fas ligand; tumor necrosis factor (ligand) superfamily, member 6Location: 1q23Chromosome: 1 Annotation: NC_000001.9 (170894807..170902635)MIM: 134638GeneID: 356
63: FAS
Official Symbol: FAS and Name: Fas (TNF receptor superfamily, member 6) [Homo sapiens]
Other Aliases: ALPS1A, APO-1, APT1, CD95, FAS1, FASTM, TNFRSF6
Other Designations: APO-1 cell surface antigen; CD95 antigen; Fas antigen;
OTTHUMP00000059646; apoptosis antigen 1; tumor necrosis factor receptor
superfamily, member 6
Location: 10q24.1
Chromosome: 10
Annotation: NC_000010.9 (90740267..90765521)
MIM: 134637
GeneID: 355

64: APOE
Official Symbol: APOE and Name: apolipoprotein E [Homo sapiens]
Other Aliases: AD2, MGC1571, apoprotein
Other Designations: Alzheimer disease 2
(APOE*E4-associated, late onset); apolipoprotein E3
Location: 19q13.2
Chromosome: 19
Annotation: NC_000019.8 (50100878..50104489)
MIM: 107741
GeneID: 348

65: APOB
Official Symbol: APOB and Name: apolipoprotein B (including Ag(x) antigen) [Homo sapiens]
Other Aliases: FLDB
Other Designations: apoB-100; apoB-48; apolipoprotein B; apolipoprotein B48
Location: 2p24-p23
Chromosome: 2
Annotation: NC_000002.10 (21120449..21077805, complement)
MIM: 107730
GeneID: 338
DNA Repair genes

1: LOC731238
   hypothetical protein LOC731238 [Homo sapiens]
   Chromosome: 15
   GeneID: 731238

2: LOC730716
   similar to aryl hydrocarbon receptor [Homo sapiens]
   Chromosome: 7
   GeneID: 730716

3: LOC730361
   similar to aryl hydrocarbon receptor [Homo sapiens]
   Chromosome: 7
   GeneID: 730361

4: LOC729939
   similar to aryl hydrocarbon receptor [Homo sapiens]
   Location: 7p21.1
   Chromosome: 7
   Annotation: NC_000007.12 (17277287..17305061)
   GeneID: 729939

5: LOC729029
   hypothetical protein LOC729029 [Homo sapiens]
   Location: 15q15.1
   Chromosome: 15
   Annotation: NC_000015.8 (38775301..38773222, complement)
   GeneID: 729029

6: LOC727725
   hypothetical protein LOC727725 [Homo sapiens]
   Location: 8p11.21
   Chromosome: 8
   Annotation: NC_000008.9 (40778069..42752013)
   GeneID: 727725

7: KLC3
   Official Symbol: KLC3 and Name: kinesin light chain 3 [Homo sapiens]
   Other Aliases: KLC2, KLC2L, KLCt, KNS2B
   Other Designations: KLC2-like; kinesin light chain 2-like
   Location: 19q13.2-q13.3
   Chromosome: 19
   Annotation: NC_000019.8 (50535837..50546617)
   MIM: 601334
   GeneID: 147700

8: C3orf24
   Official Symbol: C3orf24 and Name: chromosome 3 open reading frame 24 [Homo sapiens]
   Other Aliases: MGC40179
   Other Designations: hypothetical protein LOC115795
   Location: 3p25.3
   Chromosome: 3
   Annotation: NC_000003.10 (10124914..10098003, complement)
   GeneID: 115795

9: TMEM55B
   Official Symbol: TMEM55B and Name: transmembrane protein 55B [Homo sapiens]
   Other Aliases: C14orf9, DKFZp434M0519, MGC26684
   Other Designations: PtdIns-4,5-P(2) 4-phosphatase type I
   Location: 14q11.2
   Chromosome: 14
   Annotation: NC_000014.7 (19999475..19995856, complement)
   MIM: 609865
   GeneID: 90809

10: FLJ22028
    hypothetical protein FLJ22028 [Homo sapiens]
    Other Designations: hypothetical protein LOC79912
    Location: 12p12.1
    Chromosome: 12
    Annotation: NC_000012.10 (21481877..21514566)
    GeneID: 79912

11: TTLL3
    Official Symbol: TTLL3 and Name: tubulin tyrosine ligase-like family, member 3
    [Homo sapiens]
    Other Aliases: DKFZP434B103, DKFZp686D076, FLJ13898, HOTTL,
    MGC120529, MGC120530, MGC120532
    Location: 3p25.3
    Chromosome: 3
    Annotation: NC_000003.10 (9835055..9855084)
    GeneID: 26140

12: RAD54B
    Official Symbol: RAD54B and Name: RAD54 homolog B (S. cerevisiae)
    [Homo sapiens]
    Other Aliases: FSBP
    Other Designations: RAD54 homolog B; RAD54, S. cerevisiae, homolog of, B; fibrinogen silencer binding protein
    Location: 8q21.3-q22
    Chromosome: 8
    Annotation: NC_000008.9 (95556485..95453363, complement)
    Chromosome: 8
    Annotation: NC_000008.9 (95518307..95513350, complement)
    MIM: 604289
    GeneID: 25788

13: RASSF1
    Official Symbol: RASSF1 and Name: Ras association (RalGDS/AF-6) domain family 1
    [Homo sapiens]
    Other Aliases: 123F2, NORE2A, RASSF1A, RDA32, REH3P21
    Other Designations: Ras association domain family 1; Ras association domain family protein 1; WUGSC:H_LUCA12.5; cardiac-specific ras association domain family 1 protein; pancreas-specific ras association domain family 1 protein; tumor suppressor protein RDA32
    Location: 3p21.3
    Chromosome: 3
    Annotation: NC_000003.10 (50353370..50342220, complement)
    MIM: 605082
    GeneID: 11186

14: CD3EAP
    Official Symbol: CD3EAP and Name: CD3e molecule, epsilon associated protein
    [Homo sapiens]
    Other Aliases: ASE-1, CAST, MGC118851, PAF49
    Other Designations: DNA Repair genes
CD3 epsilon associated protein; CD3E antigen, epsilon polypeptide associated protein; CD3e antigen, epsilon polypeptide associated protein; antisense to ERCC
Location: 19q13.3 Chromosome: 19 Annotation: NC_000019.8 (50601306..50605863) MIM: 107325 GeneID: 10849
15: EPM2AIP1
Official Symbol: EPM2AIP1 and Name: EPM2A (laforin) interacting protein 1 [Homo sapiens] Other Aliases: FLJ11207, KIAA0766 Other Designations: EPM2A interacting protein 1; laforin interacting protein 1 Location: 3p22.1 Chromosome: 3 Annotation: NC_000003.10 (37009798..37004232, complement) MIM: 607911 GeneID: 9852
16: CAMK1
Official Symbol: CAMK1 and Name: calcium/calmodulin-dependent protein kinase I [Homo sapiens] Other Aliases: CAMKI, MGC120317, MGC120318 Location: 3p25.3 Chromosome: 3 Annotation: NC_000003.10 (9786660..9774030, complement) MIM: 604998 GeneID: 8536
17: XRCC5
Official Symbol: XRCC5 and Name: X-ray repair complementing defective repair in Chinese hamster cells 5 (double-strand-break rejoining; Ku autoantigen, 80kDa) [Homo sapiens] Other Aliases: FLJ39089, KARP-1, KARP1, KU80, KUB2, Ku86, NF1V Other Designations: ATP-dependent DNA helicase II; DNA repair protein XRCC5; Ku86 autoantigen related protein 1; X-ray repair complementing defective repair in Chinese hamster cells 5 (double-strand-break rejoining; Ku autoantigen, 80kDa); X-ray repair, complementing defective, repair in Chinese hamster Location: 2q35 Chromosome: 2 Annotation: NC_000002.10 (216682377..216779247) MIM: 194364 GeneID: 7520
18: XRCC4
19: XRCC3
Official Symbol: XRCC3 and Name: X-ray repair complementing defective repair in Chinese hamster cells 3 [Homo sapiens] Other Designations: DNA repair protein XRCC3; RAD51-like; X-ray repair cross complementing protein 3; X-ray-repair, complementing defective, repair in Chinese hamster Location: 14q32.3 Chromosome: 14 Annotation: NC_000014.7 (103251548..103233706, complement) MIM: 600675 GeneID: 7517
20: XRCC2
21: XRCC1
22: XPC
23: XPA
Official Symbol: XPA and Name: xeroderma pigmentosum, complementation group A [Homo sapiens] Other Aliases: XP1, XPA Other Designations: excision

DNA Repair genes
DNA Repair genes

24: WRN
- **Official Symbol:** WRN
- **Name:** Werner syndrome [Homo sapiens]
- **Other Aliases:** DKFZp686C2056, RECQ3, RECQL2, RECQL3
- **Other Designations:** Werner Syndrome helicase; Werner syndrome protein
- **Location:** 8p12-p11.2
- **Chromosome:** 8
- **Annotation:** NC_000008.9 (31010319..31150818), MIM: 604611, GeneID: 7507

25: VEGFA
- **Official Symbol:** VEGFA and Name: vascular endothelial growth factor A [Homo sapiens]
- **Other Aliases:** MGCl70609, VEGF, VEGF-A, VPFOther Designations: vascular permeability factor
- **Location:** 6p12
- **Chromosome:** 6
- **Annotation:** NC_000006.10 (43845930..43862201), MIM: 192240, GeneID: 7422

26: VDR
- **Official Symbol:** VDR and Name: vitamin D (1,25- dihydroxyvitamin D3) receptor [Homo sapiens]
- **Other Aliases:** NR1I1
- **Other Designations:** vitamin D (1,25-dihydroxyvitamin D3) receptor
- **Location:** 12q13.11
- **Chromosome:** 12
- **Annotation:** NC_000012.10 (46585080..46521586), MIM: 601769, GeneID: 7421

27: TSC1
- **Official Symbol:** TSC1 and Name: tuberous sclerosis 1 [Homo sapiens]
- **Other Aliases:** KIAA0243, LAM, MGC86987, TSC
- **Other Designations:** hamartin; tuberous sclerosis 1 protein; tumor suppressor
- **Location:** 9q34
- **Chromosome:** 9
- **Annotation:** NC_000009.10 (134809840..134756556), MIM: 605284, GeneID: 7248

28: TERT
- **Official Symbol:** TERT and Name: telomerase reverse transcriptase [Homo sapiens]
- **Other Aliases:** EST2, TCS1, TP2, TRT, hEST2Other Designations: telomerase catalytic subunit
- **Location:** 5p15.33
- **Chromosome:** 5
- **Annotation:** NC_000005.8 (1348158..1306281), MIM: 187270, GeneID: 7015

29: SRD5A2
- **Official Symbol:** SRD5A2 and Name: steroid-5-alpha-reductase, alpha polypeptide 2 (3-oxo-5 alpha-steroid delta 4-dehydrogenase alpha 2) [Homo sapiens]
- **Other Aliases:** MGC138457
- **Other Designations:** 3-oxo-5 alpha-steroid 4-dehydrogenase 2; steroid 5-alpha-reductase 2
- **Location:** 2p23
- **Chromosome:** 2
- **Annotation:** NC_000002.10 (31659543..31603159), MIM: 607306, GeneID: 6716

30: RECQL
- **Official Symbol:** RECQL and Name: RecQ protein-like (DNA helicase Q1-like) [Homo sapiens]
- **Other Aliases:** RECQL1, RecQ1Other Designations: ATP-dependent DNA helicase Q1; DNA helicase Q1-like; RecQ protein-like
- **Location:** 9q31.2
- **Chromosome:** 9
- **Annotation:** NC_000009.10 (99499459..99477011, complement), MIM: 278700, GeneID: 7507

31: RAD51L3
- **Official Symbol:** RAD51L3 and Name: RAD51-like 3 (S. cerevisiae) [Homo sapiens]
- **Other Aliases:** HsTRAD, R51H3, RAD51D
- **Other Designations:** DNA repair protein RAD51 homolog 4; RAD51 (S. cerevisiae)-like 3; RAD51-like 3; recombination repair protein
- **Location:** 17q11
- **Chromosome:** 17
- **Annotation:** NC_000012.10 (21545795..21513964), MIM: 600537, GeneID: 5965

32: RAD51
- **Official Symbol:** RAD51 and Name: RAD51 homolog (RecA homolog, E. coli) (S. cerevisiae) [Homo sapiens]
- **Other Aliases:** BRCC5, HRAD51, HsRad51, HsT16930, RAD51A, RECAOther Designations: BRCA1/BRCA2-containing complex, subunit 5; DNA repair protein RAD51 homolog 1; RAD51 homolog protein; RAD51, S.cerevisiae, homolog of, A; RecA, E. coli, homolog of; RecA-like protein; recombination protein
- **Location:** 15q15.1
- **Chromosome:** 15
- **Annotation:** NC_000015.8 (38774660..38811645), MIM: 179617, GeneID: 5888

33: RAD23B
- **Official Symbol:** RAD23B and Name: RAD23 homolog B (S. cerevisiae) [Homo sapiens]
- **Other Aliases:** HHR23B, HR23B, P58Other Designations: RAD23, yeast homolog of, B; UV excision repair protein RAD23 homolog B; XP-C repair complementing complex 58 kDa; XP-C repair complementing protein
- **Location:** 9q31.2
- **Chromosome:** 9
- **Annotation:** NC_000009.10 (109085364..109134290), MIM:
DNA Repair genes

34: PTCH1
Official Symbol: PTCH1 and Name: patched homolog 1 (Drosophila) [Homo sapiens]
Other Aliases: RP11-43505.3, BCNS, FLJ26746, FLJ42602, HPE7, NBCCS, PTC, PTC1, PTCH
Other Designations: PTCH protein +12b; PTCH protein +4'; PTCH protein -10; patched
Location: 9q22.3
Chromosome: 9
Annotation: NC_000009.10 (97310651..97246207, complement)
MIM: 601309
GeneID: 5887

35: PRKAR1A
Official Symbol: PRKAR1A and Name: protein kinase, cAMP-dependent, regulatory, type I, alpha (tissue specific extinguisher 1) [Homo sapiens]
Other Aliases: CAR, CNC, CNC1, DFKZp779L0468, MGC17251, PKR1, PPNA1, PRKAR1, TSE1
Other Designations: cAMP-dependent protein kinase regulatory subunit Ralpha; cAMP-dependent protein kinase type I-alpha regulatory chain; cAMP-dependent protein kinase, regulatory subunit alpha 1; protein kinase A type 1a regulatory subunit; tissue-specific extinguisher 1
Location: 17q23-q24
Chromosome: 17
Annotation: NC_000017.9 (64019704..64040505)
MIM: 188830
GeneID: 5573

36: POLB
Official Symbol: POLB and Name: polymerase (DNA directed), beta [Homo sapiens]
Other Aliases: MGC125976
Other Designations: DNA pol beta; DNA polymerase beta; DNA polymerase beta subunit
Location: 8p11.2
Chromosome: 8
Annotation: NC_000008.9 (42315186..42348469)
MIM: 174760
GeneID: 5423

37: PMS2
Official Symbol: PMS2 and Name: PMS2 postmeiotic segregation increased 2 (S. cerevisiae) [Homo sapiens]
Other Aliases: HNPPCC4, PMS2CL, PMSL2
Other Designations: DNA mismatch repair gene homologue; DNA mismatch repair protein
PMS2; H_DJ0042M02.9; PMS1 protein homolog 2; PMS2 postmeiotic segregation increased 2; colorectal cancer, hereditary nonpolyposis, type 4; postmeiotic segregation increased (S. cerevisiae) 2
Location: 7p22.2
Chromosome: 7
Annotation: NC_000007.12 (6015231..5979395, complement)
MIM: 600259
GeneID: 5395

38: PHB
Official Symbol: PHB and Name: prohibitin [Homo sapiens]
Location: 17q21
Chromosome: 17
Annotation: NC_000017.9 (44847240..44836418, complement)
MIM: 176705
GeneID: 5245

39: P2RX7
Official Symbol: P2RX7 and Name: purinergic receptor P2X, ligand-gated ion channel, 7 [Homo sapiens]
Other Aliases: MGC20089, P2X7
Other Designations: ATP receptor; P2X purinoceptor 7; P2X7 receptor; purinergic receptor
Location: 12q24
Chromosome: 12
Annotation: NC_000012.10 (120055060..120108258)
MIM: 602566
GeneID: 5027

40: OGG1
Official Symbol: OGG1 and Name: 8-oxoguanine DNA glycosylase [Homo sapiens]
Other Aliases: HMMH, HOGG1, MUTM, OGH1
Other Designations: 8-hydroxyguanine DNA glycosylase; OGG1 type 1d; OGG1 type 1e; OGG1 type 1g; OGG1 type 1h
Location: 3p26.2
Chromosome: 3
Annotation: NC_000003.10 (9765704..9783341)
MIM: 601982
GeneID: 4968

41: NBN
Official Symbol: NBN and Name: nibrin [Homo sapiens]
Other Aliases: AT-V1, AT-V2, ATV, FLJ10155, MGC87362, NBS, NBS1
Other Designations: Nijmegen breakage syndrome 1; Nijmegen breakage syndrome 1 (nibrin); p95 protein of the MRE11/RAD50 complex
Location: 8q21
Chromosome: 8
Annotation: NC_000008.9 (91066074..91014739, complement)
MIM: 602667
GeneID: 4683

42: MUTYH
Official Symbol: MUTYH and Name: mutY homolog (E. coli) [Homo sapiens]
Other Aliases: MGC4416, MYPH
Other Designations: A/G-specific adenine DNA glycosylase; mutY homolog
Location: 1p34.3-p32.1
Chromosome: 1
Annotation: NC_000001.9 (45578646..45567500, complement)
MIM: 604933
GeneID: 4595

43: MSH3
Official Symbol: MSH3 and Name: mutS homolog 3 (E. coli) [Homo sapiens]
Other Aliases: DUP, MGC163306, MGC163308, MRPI
Other Designations: Divergent upstream
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<td>ligase III, DNA, ATP-dependent [Homo sapiens]</td>
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<td>17</td>
<td>17q11.2-q12</td>
<td>NC_000017.9 (30331650..30356200)</td>
<td>600940</td>
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<td>LIG1</td>
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<td>ligase I, DNA, ATP-dependent [Homo sapiens]</td>
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<td>KLC1</td>
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<td>kinesin light chain 1 [Homo sapiens]</td>
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<td>14</td>
<td>14q32.3</td>
<td>NC_000014.7 (103165316..103247465)</td>
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<td>interleukin 6 (interferon, beta 2) [Homo sapiens]</td>
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<td>7p21</td>
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<td>mutS homolog 6 (E. coli) [Homo sapiens]</td>
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<td>Fanconi anemia, complementation group G [Homo sapiens]</td>
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<td>9p13</td>
<td>NC_000009.10 (35070012..35063834)</td>
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<td>Fanconi anemia, complementation group D2 [Homo sapiens]</td>
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<td>D2</td>
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FLJ23826 Other Designations: Fanconi anemia complementation group D2; type 4
Fanconi pancytopenia Location: 3p26 Chromosome: 3 Annotation: NC_00003.10
(10043112..10118613) MIM: 227646 GeneID: 2177

55: EXT1
Official Symbol: EXT1 and Name: exostoses (multiple) 1 [Homo sapiens] Other
Aliases: EXT, ttv Other Designations: Glucuronosyl-N-acetylglucosaminyl-proteoglycan 4-alpha-N-acetylglucosaminyltransferase; N-acetylglucosaminyl-proteoglycan 4-beta-glucuronosyltransferase; exostosin 1 Location: 8q24.11-q24.13 Chromosome: 8 Annotation: NC_000008.9 (119193238..118880782, complement) MIM: 608177 GeneID: 2131

56: ERCC5

57: ERCC4

58: ERCC2
Official Symbol: ERCC2 and Name: excision repair cross-complementing rodent repair deficiency, complementation group 2 (xeroderma pigmentosum D) [Homo sapiens] Other Aliases: COFS2, EM9, MGC102762, MGC126218, MGC126219, TTD, XPD Other Designations: excision repair cross-complementing rodent repair deficiency, complementation group 2 protein; trichothiodystrophy Location: 19q13.3 Chromosome: 19 Annotation: NC_000019.8 (50565668..50546685, complement) MIM: 126380 GeneID: 2067

59: ERCC1
Official Symbol: ERCC1 and Name: excision repair cross-complementing rodent repair deficiency, complementation group 1 (includes overlapping antisense sequence) [Homo sapiens] Other Aliases: COFS4, UV20 Other Designations: excision repair cross-complementing 1; excision repair protein Location: 19q13.2-q13.3 Chromosome: 19 Annotation: NC_000019.8 (50619016..50604711, complement) MIM: 126380 GeneID: 2067

60: EP300

61: DHFR
Official Symbol: DHFR and Name: dihydrofolate reductase [Homo sapiens] Location: 5q11.2-q13.2 Chromosome: 5 Annotation: NC_000005.8 (79986555..79957800, complement) MIM: 126060 GeneID: 1719

62: GADD45A
Official Symbol: GADD45A and Name: growth arrest and DNA-damage-inducible, alpha [Homo sapiens] Other Aliases: RP5-975D15.1, DDIT1, GADD45 Other Designations: DNA damage-inducible transcript 1; DNA damage-inducible transcript-1; DNA-damage-inducible transcript 1 Location: 1p31.2-p31.1 Chromosome: 1 Annotation: NC_000001.9 (67923470..67926606) MIM: 126335 GeneID: 1647

63: KLF6
Official Symbol: KLF6 and Name: Kruppel-like factor 6 [Homo sapiens] Other Aliases: RP11-184A2.1, BCD1, COPEB, CPBP, DKFZp686N0199, GFB, PAC1, ST12,
ZF9 Other Designations: B-cell derived 1; core promoter element binding protein; core promoter element-binding protein, N-terminus truncated; prostate adenocarcinoma-1; protooncogene BCD1; suppression of tumorigenicity 12 (prostate)
Location: 10p15
Chromosome: 10
Annotation: NC_000010.9 (3817454..3808187, complement) MIM: 602053
GeneID: 1316

64: CDA
Official Symbol: CDA and Name: cytidine deaminase [Homo sapiens]
OtherAliases: CDD
OtherDesignations: cytidine aminohydrolase; cytosine nucleoside deaminase; small cytidine deaminase
Location: 1p36.2-p35
Chromosome: 1
Annotation: NC_000001.9 (20788030..20817987) MIM: 123920
GeneID: 978

65: BRCA2
Official Symbol: BRCA2 and Name: breast cancer 2, early onset [Homo sapiens]
OtherAliases: RP11-298P3.4, BRCC2, FACD, FAD, FAD1, FANCB, FANCD, FANCD1
OtherDesignations: BRCA1/BRCA2-containing complex, subunit 2; Fanconi anemia, complementation group D1; OTTHUMP00000042401; breast and ovarian cancer susceptibility gene, early onset; breast cancer 2 tumor suppressor; breast cancer susceptibility protein BRCA2
Location: 13q12.3
Chromosome: 13
Annotation: NC_000013.9 (31787616..31871808) MIM: 600185
GeneID: 675

66: BRCA1
Official Symbol: BRCA1 and Name: breast cancer 1, early onset [Homo sapiens]
OtherAliases: BRCAI, BRCC1, IRIS, PSCP, RNF53
OtherDesignations: BRCA1/BRCA2-containing complex, subunit 1; breast and ovarian cancer susceptibility protein 1
Location: 17q21
Chromosome: 17
Annotation: NC_000017.9 (38530993..38449839, complement) MIM: 113705
GeneID: 672

67: BIK
Official Symbol: BIK and Name: BCL2-interacting killer (apoptosis-inducing) [Homo sapiens]
OtherAliases: BIP1, BP4, NBK
OtherDesignations: BCL2-interacting killer; OTTHUMP00000028974; apoptosis-inducing NBK
Location: 22q13.3
Chromosome: 22
Annotation: NC_000022.9 (41836700..41855661) MIM: 603392
GeneID: 638

68: BCL2
Official Symbol: BCL2 and Name: B-cell CLL/lymphoma 2 [Homo sapiens]
OtherAliases: Bcl-2
OtherDesignations: B-cell lymphoma protein 2
Location: 18q21.3
Chromosome: 18
Annotation: NC_000018.8 (59137592..58941558, complement) MIM: 151430
GeneID: 596

69: BARD1
Official Symbol: BARD1 and Name: BRCA1 associated RING domain 1 [Homo sapiens]
OtherDesignations: BRCA1-associated RING domain 1; BRCA1-associated RING domain gene 1
Location: 2q34-q35
Chromosome: 2
Annotation: NC_000002.10 (215382610..215301521, complement) MIM: 601593
GeneID: 580

70: ATR
Official Symbol: ATR and Name: ataxia telangiectasia and Rad3 related [Homo sapiens]
OtherAliases: FRP1, MEC1, SCKL, SCKL1
OtherDesignations: FRAP-related protein-1; MEC1, mitosis entry checkpoint 1, homolog; Rad3 related protein; Seckel syndrome; ataxia telangiectasia and Rad3 related protein; protein kinase ATR
Location: 3q22-q24
Chromosome: 3
Annotation: NC_00003.10 (143780340..143650768, complement) MIM: 601215
GeneID: 545

71: ATM
Official Symbol: ATM and Name: ataxia telangiectasia mutated (includes complementation groups A, C and D) [Homo sapiens]
OtherAliases: AT1, ATA, ATC, ATD, ATDC, ATE, DKFZp781A0353, MGC74674, TEL1, TELO1
OtherDesignations: AT complementation group A; AT complementation group C; AT complementation group D; AT complementation group E; AT mutated; AT protein; TEL1, telomere maintenance 1, homolog; ataxia telangiectasia mutated protein; human phosphatidylinositol 3-kinase homolog; serine-protein kinase ATM
Location: 11q22-q23
Chromosome: 11
Annotation: NC_000011.8 (107598768..107745035) MIM: 607585
GeneID: 472

72: FAS
Official Symbol: FAS and Name: Fas (TNF receptor superfamily, member 6) [Homo sapiens]
OtherAliases: ALPS1A, APO-1, APT1, CD95, FAS1, FASTM, TNFRSF6
OtherDesignations: APO-1 cell surface antigen; CD95 antigen; Fas antigen;
OTTHUMP00000059646; apoptosis antigen 1; tumor necrosis factor receptor superfamily, member 6
Location: 10q24.1
Chromosome: 10
Annotation: NC_000010.9
(90740267..90765521)MIM: 134637
GeneID: 355

73: APEX1
Official Symbol: APEX1 and Name: APEX nuclease (multifunctional DNA repair enzyme) 1 [Homo sapiens]
Other Aliases: APE, APE1, APEN, APEX, APX, HAP1, REF-1, REF1
Other Designations: AP endonuclease class I; AP lyase; APEX nuclease; DNA-(apurinic or apyrimidinic site) lyase; apurinic/apyrimidinic (abasic) endonuclease; apurinic/apyrimidinic exonuclease; deoxyribonuclease (apurinic or apyrimidinic); multifunctional DNA repair enzyme
Location: 14q11.2-q12
Chromosome: 14
Annotation: NC_000014.7 (19993129..19995765)MIM: 152390
GeneID: 328

74: APC
Official Symbol: APC and Name: adenomatosis polyposis coli [Homo sapiens]
Other Aliases: DP2, DP2.5, DP3, FAP, FPC, GSOther Designations: adenomatosis polyposis coli tumor suppressor; adenomatous polyposis coli protein; adenomatous polyposis coli tumor suppressor
Location: 5q21-q22
Chromosome: 5
Annotation: NC_000005.8 (112101482..112209834)MIM: 175100
GeneID: 324

75: ALOX5
Official Symbol: ALOX5 and Name: arachidonate 5-lipoxygenase [Homo sapiens]
Other Aliases: RP11-67C2.3, 5-LO, 5LPG, LOG5, MGC163204
Other Designations: arachidonic acid 5-lipoxygenase; leukotriene A4 synthase
Location: 10q11.2
Chromosome: 10
Annotation: NC_000010.9 (45189634..45261570)MIM: 152390
GeneID: 240

76: AHR
Official Symbol: AHR and Name: aryl hydrocarbon receptor [Homo sapiens]
Other Designations: AH-receptor; aromatic hydrocarbon receptor
Location: 7p15
Chromosome: 7
Annotation: NC_000007.12 (17304831..17352298)MIM: 600253
GeneID: 196

77: PARP4
Official Symbol: PARP4 and Name: poly (ADP-ribose) polymerase family, member 4 [Homo sapiens]
Other Aliases: ADPRTL1, PARPL, PH5P, VAULT3, VPARP, p193
Other Designations: ADP-ribosyltransferase (NAD+; poly (ADP-ribose)) polymerase-like 1; H5 proline-rich; I-alpha-I-related; OTTHUMP00000042288; PARP-related; poly(ADP-ribose) synthetase; poly(ADP-ribose)transferase-like 1; vault protein, 193-kDa
Location: 13q11
Chromosome: 13
Annotation: NC_000013.9 (23984947..23893069, complement)MIM: 607519
GeneID: 143

78: PARP1
Official Symbol: PARP1 and Name: poly (ADP-ribose) polymerase family, member 1 [Homo sapiens]
Other Aliases: RP11-125A15.2, ADPRT, ADPRT1, PARP, PARP-1, PPOL, pADPRT-10
Other Designations: ADP-ribosyltransferase (NAD+; poly (ADP-ribose)) polymerase; ADP-ribosyltransferase NAD(+); poly(ADP-ribose) polymerase; poly(ADP-ribose) synthetase; poly(ADP-ribose)transferase
Location: 1q41-q42
Chromosome: 1
Annotation: NC_000001.9 (224662413..224615128, complement)MIM: 173870
GeneID: 142

DNA Repair genes
### Cell Cycle genes

1: **LOC731267**
   - Hypothetical protein LOC731267 [Homo sapiens]
   - Chromosome: 12
   - GeneID: 731267

2: **LOC728876**
   - Hypothetical protein LOC728876 [Homo sapiens]
   - Location: 12p13.1
   - Chromosome: 12
   - Annotation: NC_000012.10 (12768838..12768064, complement)
   - GeneID: 728876

3: **ALS2CR12**
   - Official Symbol: ALS2CR12
   - Name: Amyotrophic lateral sclerosis 2 (juvenile) chromosome region, candidate 12 [Homo sapiens]
   - Location: 2q33.1
   - Chromosome: 2
   - Annotation: NC_000002.10 (201924420..201861229, complement)
   - GeneID: 130540

4: **C17orf37**
   - Official Symbol: C17orf37
   - Name: Chromosome 17 open reading frame 37 [Homo sapiens]
   - Location: 17q12
   - Chromosome: 17
   - Annotation: NC_000017.9 (35140313..35138934, complement)
   - GeneID: 84299

5: **CHEK2**
   - Official Symbol: CHEK2
   - Name: CHK2 checkpoint homolog (S. pombe)
   - Other Aliases: RP11-436C9.1, CDS1, CHK2, HuCds1, LFS2, PP1425, RAD53
   - Other Designations: OTTHUMP00000028871; checkpoint-like protein CHK2; protein kinase CHK2; serine/threonine-protein kinase CHK2
   - Location: 17q12
   - Chromosome: 17
   - Annotation: NC_000017.9 (35140313..35138934, complement)
   - GeneID: 11200

6: **TNFRSF10A**
   - Official Symbol: TNFRSF10A
   - Name: Tumor necrosis factor receptor superfamily, member 10a [Homo sapiens]
   - Other Aliases: APO2, CD261, DR4, MGC9365, TRAILR-1, TRAILR1
   - Other Designations: TNF-related apoptosis inducing ligand receptor 1; cytotoxic TRAIL receptor; death receptor 4
   - Location: 8p21
   - Chromosome: 8
   - Annotation: NC_000008.9 (23138583..23104914, complement)
   - GeneID: 8797

7: **IRS2**
   - Official Symbol: IRS2
   - Name: Insulin receptor substrate 2
   - Location: 13q34
   - Chromosome: 13
   - Annotation: NC_000013.9 (109236914..109204184, complement)
   - GeneID: 607052

8: **WT1**
   - Official Symbol: WT1 and Name: Wilms tumor 1 [Homo sapiens]
   - Other Aliases: GUD, WAGR, WIT-2, WT33
   - Location: 11p13
   - Chromosome: 11
   - Annotation: NC_000011.8 (32413662..32365900, complement)
   - GeneID: 607012

9: **VHL**
   - Official Symbol: VHL
   - Name: Von Hippel-Lindau tumor suppressor [Homo sapiens]
   - Other Aliases: HRCA1, RCA1, VHL1
   - Other Designations: elongin binding protein; von Hippel-Lindau syndrome
   - Location: 3p26-p25
   - Chromosome: 3
   - Annotation: NC_000003.10 (10158318..10168761)
   - GeneID: 608537

10: **TP53BP2**
    - Official Symbol: TP53BP2
    - Name: Tumor protein p53 binding protein 2
    - Other Aliases: 53BP2, ASPP2, BBP, PPP1R13A, p53BP2
    - Other Designations: BCL2-binding protein; NY-REN-51 antigen; apoptosis-stimulating protein of p53, 2; tumor suppressor p53-binding protein 2
    - Location: 1q22
    - Chromosome: 1
    - Annotation: NC_000019.9 (222100254..222034412, complement)
    - GeneID: 602143

11: **TP53BP1**
    - Official Symbol: TP53BP1
    - Name: Tumor protein p53 binding protein, 1
    - Other Aliases: 53BP1, FLJ41424, MGC138366, p202
    - Other Designations: tumor protein 53-binding protein, 1; tumor protein p53-binding protein, 1
    - Location: 15q15-q21
    - Chromosome: 15
    - Annotation: NC_000015.8 (41590027..41486985, complement)
    - GeneID: 605230

12: **TP53**
    - Official Symbol: TP53
    - Name: Tumor protein p53 (Li-Fraumeni syndrome)
    - Other Aliases: LFS1, TRP53, p53
    - Other Designations: tumor suppressor; tumor protein p53
    - Location: 17p13.1
    - Chromosome: 17
    - Annotation: NC_000017.9
13: RNASEL
Official Symbol: RNASEL and Name: ribonuclease L (2',5'-oligoisoadenylate synthetase-dependent) [Homo sapiens] Other Aliases: DKFZp781D08126, MGC104972, MGC133329, PRCA1, RNS4 Other Designations: 2',5'-oligoisoadenylate synthetase-dependent; interferon-activated 2'-5A-dependent RNase; ribonuclease 4; ribonuclease L Location: 1q25 Chromosome: 1 Annotation: NC_000001.9 (7531641..7512463, complement) MIM: 191170 GeneID: 7157

14: RET
Official Symbol: RET and Name: ret proto-oncogene [Homo sapiens] Other Aliases: CDH12, HSCR1, MEN2A, MEN2B, MTC1, PTC, RET-ELE1, RET51 Other Designations: Hirschsprung disease 1; RET transforming sequence; cadherin family member 12; hydroxyaryl-protein kinase; multiple endocrine neoplasia and medullary thyroid carcinoma 1; oncogene RET; receptor tyrosine kinase; ret proto-oncogene (multiple endocrine neoplasia and medullary thyroid carcinoma 1, Hirschsprung disease) Location: 10q11.2 Chromosome: 10 Annotation: NC_000010.9 (42892532..42944954) MIM: 164761 GeneID: 5979

15: RB1
Official Symbol: RB1 and Name: retinoblastoma 1 (including osteosarcoma) [Homo sapiens] Other Aliases: OSRC, RBO Other Designations: retinoblastoma 1; retinoblastoma susceptibility protein; retinoblastoma susceptibility protein; retinoblastoma-1 Location: 13q14.2 Chromosome: 13 Annotation: NC_000013.9 (47775911..47954022) MIM: 180200 GeneID: 5925

16: RAD9A

17: PPP1CA
Official Symbol: PPP1CA and Name: protein phosphatase 1, catalytic subunit, alpha isoform [Homo sapiens] Other Aliases: MGC15877, MGC1674, PP-1A, PPP1A Other Designations: protein phosphatase 1, catalytic subunit, alpha; serine/threonine protein phosphatase PP1-alpha 1 catalytic subunit Location: 11q13 Chromosome: 11 Annotation: NC_000011.8 (66925951..66922227, complement) MIM: 176875 GeneID: 5499

18: PDGFRB
Official Symbol: PDGFRB and Name: platelet-derived growth factor receptor, beta polypeptide [Homo sapiens] Other Aliases: CD140B, JTK12, PDGF-R-beta, PDGFR, PDGFR1 Other Designations: beta platelet-derived growth factor receptor; platelet-derived growth factor receptor beta Location: 5q31-q32 Chromosome: 5 Annotation: NC_000005.8 (149515614..149473594, complement) MIM: 173410 GeneID: 5159

19: PDGFR
Official Symbol: PDGFR and Name: platelet-derived growth factor receptor, alpha polypeptide [Homo sapiens] Other Aliases: CD140A, MGC74795, PDGFR2, Rho-PDGFR Other Designations: FIP1L1/PDGFR fusion; FIP1L1/PDGFR fusion protein; platelet-derived growth factor receptor alpha; rearranged-in-hyperesinophilia-platelet derived growth factor receptor alpha fusion protein Location: 4q11-q13 Chromosome: 4 Annotation: NC_000004.10 (54790203..54859168) MIM: 173490 GeneID: 5156

20: PCNA

21: NF2
Official Symbol: NF2 and Name: neurofibromin 2 (bilateral acoustic neuroma) [Homo sapiens] Other Aliases: ACN, BANF, SCH Other Designations: merlin; moesin-ezrin-radixin-like protein; neurofibromatosis type 2; neurofibromatosis-2; neurofibromin 2; schwannomerlin; schwannomin Location:
22q12.2Chromosome: 22 Annotation: NC_000022.9 (28329564..28424586)MIM: 607379GeneID: 4771
22: NF1
Official Symbol: NF1 and Name: neurofibromin 1 (neurofibromatosis, von Recklinghausen disease, Watson disease) [Homo sapiens]Other Aliases: DKFZp686J1293, NFNS, VRNF, WSSOther Designations: Neurofibromin (neurofibromatosis, type I); neurofibrominLocation: 17q11.2Chromosome: 17 Annotation: NC_000017.9 (26446242..26725589)MIM: 162200GeneID: 4763
23: MGMT
Official Symbol: MGMT and Name: O-6-methylguanine-DNA methyltransferase [Homo sapiens]Other Aliases: RP11-109A6.1Other Designations: Methylguanine-DNA methyltransferase; O6-methylguanine-DNA methyltransferaseLocation: 10q26Chromosome: 10 Annotation: NC_000010.9 (131155455..131455357)MIM: 156569GeneID: 4255
24: MDM2
Official Symbol: MDM2 and Name: Mdm2, transformed 3T3 cell double minute 2, p53 binding protein (mouse) [Homo sapiens]Other Aliases: HDMX, MGC71221, hdm2Other Designations: mouse double minute 2 homolog; mouse double minute 2, human homolog of; p53-binding protein; p53-binding protein MDM2; ubiquitin-protein ligase E3 Mdm2Location: 12q14.3-q15Chromosome: 12 Annotation: NC_000012.10 (67488246..67520480)MIM: 164785GeneID: 4193
25: SMAD2
Official Symbol: SMAD2 and Name: SMAD family member 2 [Homo sapiens]Other Aliases: JV18, JV18-1, MADH2, MADR2, MGC22139, MGC34440, hMAD-2, hSMAD2Other Designations: MAD, mothers against decapentaplegic homolog 2; Mad protein homolog; Mad, mothers against decapentaplegic homolog 2; Mad-related protein 2; SMAD, mothers against DPP homolog 2; Sma- and Mad-related protein 2; mother against DPP homolog 2Location: 18q21.1Chromosome: 18 Annotation: NC_000018.8 (43711220..43618434, complement)MIM: 601366GeneID: 4087
26: KIT
Official Symbol: KIT and Name: v-kit Hardy-Zuckerman 4 feline sarcoma viral oncogene homolog [Homo sapiens]Other Aliases: C-Kit, CD117, SCFOther Designations: mast/stem cell growth factor receptor; proto-oncogene tyrosine-protein kinase KitLocation: 4q11-q12Chromosome: 4 Annotation: NC_000004.10 (55218917..55301611)MIM: 164920GeneID: 3815
27: KDR
Official Symbol: KDR and Name: kinase insert domain receptor (a type III receptor tyrosine kinase) [Homo sapiens]Other Aliases: CD309, FLK1, VEGFR, VEGFR2Other Designations: vascular endothelial growth factor receptor 2Location: 4q11-q12Chromosome: 4 Annotation: NC_000004.10 (55686518..55639405, complement)MIM: 191306GeneID: 3791
28: FLT4
Official Symbol: FLT4 and Name: fms-related tyrosine kinase 4 [Homo sapiens]Other Aliases: FLT41, PCL, VEGFR3Other Designations: vascular endothelial growth factor receptor 3Location: 5q35.3Chromosome: 5 Annotation: NC_000005.8 (180009171..179945811, complement)MIM: 136352GeneID: 2324
29: FLT1
Official Symbol: FLT1 and Name: fms-related tyrosine kinase 1 (vascular endothelial growth factor/vascular permeability factor receptor) [Homo sapiens]Other Aliases: FLT, VEGFR1Other Designations: vascular endothelial growth factor receptor 1Location: 13q12Chromosome: 13 Annotation: NC_000013.9 (27967231..27773789, complement)MIM: 165070GeneID: 2321
30: ERBB2
Official Symbol: ERBB2 and Name: v-erb-b2 erythroblastic leukemia viral oncogene homolog 2, neuro/glioblastoma derived oncogene homolog (avian) [Homo sapiens]Other Aliases: HER-2, HER-2/neu, HER2, NEU, NGL, TKR1, c-erb B2Other Designations: c-erb B2/neu protein; erbB-2; herstatin; neuroblastoma/glioblastoma derived oncogene homolog; tyrosine kinase-type cell surface receptor; v-erb-b2 avian erythroblastic leukemia viral oncogene homolog 2 (neuro/glioblastoma derived oncogene homolog)Location: 17q21.1Chromosome: 17 Cell cycle genes
31: **EGFR**

Official Symbol: EGFR and Name: epidermal growth factor receptor (erythroblastic leukemia viral (v-erb-b) oncogene homolog, avian) [Homo sapiens]

Other Aliases: ERBB, ERBB1, mENA

Other Designations: avian erythroblastic leukemia viral (v-erb-b) oncogene homolog; cell growth inhibiting protein 40; epidermal growth factor receptor; truncated epidermal growth factor receptor

Location: 7p12

Chromosome: 7

Annotation: NC_000007.12 (55054218..55242524) MIM: 131550

GeneID: 1956

32: **CDKN2B**

Official Symbol: CDKN2B and Name: cyclin-dependent kinase inhibitor 2B (p15, inhibits CDK4) [Homo sapiens]

Other Aliases: INK4B, MTS2, P15, TP15

Other Designations: CDK inhibitory protein; CDK4B inhibitor; cyclin-dependent kinase 4 inhibitor B; cyclin-dependent kinase inhibitor 2B; cyclin-dependent kinases 4 and 6 binding protein; multiple tumor suppressor 2; p14 CDK inhibitor; p14_INK4B; p15 CDK inhibitor; p15_INK4B

Location: 9p21

Chromosome: 9

Annotation: NC_000009.10 (21999311..21992901, complement) MIM: 600431

GeneID: 1030

33: **CDKN2A**

Official Symbol: CDKN2A and Name: cyclin-dependent kinase inhibitor 2A (melanoma, p16, inhibits CDK4) [Homo sapiens]

Other Aliases: ARF, CDK4I, CDKN2, CMM2, INK4, INK4a, MLM, MTS1, TP16, p14, p14ARF, p16, p16INK4, p16INK4a, p19

Other Designations: CDK4 inhibitor p16-INK4; cell cycle negative regulator beta; cyclin-dependent kinase inhibitor 2A; cyclin-dependent kinase inhibitor p16; multiple tumor suppressor 1

Location: 9p21

Chromosome: 9

Annotation: NC_000009.10 (21984489..21957750, complement) MIM: 600160

GeneID: 1029

34: **CDKN1B**

Official Symbol: CDKN1B and Name: cyclin-dependent kinase inhibitor 1B (p27, Kip1) [Homo sapiens]

Other Aliases: CDKN4, KIP1, MEN1B, MEN4, P27KIP1

Other Designations: cyclin-dependent kinase inhibitor 1B

Location: 12p13.1-p12

Chromosome: 12

Annotation: NC_000012.10 (12761575..12766569) MIM: 600778

GeneID: 1027

35: **CDKN1A**

Official Symbol: CDKN1A and Name: cyclin-dependent kinase inhibitor 1A (p21, Cip1) [Homo sapiens]

Other Aliases: CAP20, CDKN1, CIP1, MDA-6, P21, SDI1, WAF1, p21CIP1

Other Designations: cyclin-dependent kinase inhibitor 1A; melanoma differentiation associated protein 6; wild-type p53-activated fragment 1

Location: 6p21.2

Chromosome: 6

Annotation: NC_000006.10 (36754464..36763086) MIM: 116899

GeneID: 1026

36: **CASP10**

Official Symbol: CASP10 and Name: caspase 10, apoptosis-related cysteine peptidase [Homo sapiens]

Other Aliases: ALPS2, FLICE2, MCH4

Other Designations: FADD-like ICE2; Fas-associated death domain protein; ICE-like apoptotic protease 4; apoptotic protease MCH-4; caspase 10; caspase 10, apoptosis-related cysteine protease; interleukin-1B-converting enzyme 2

Location: 2q33-q34

Chromosome: 2

Annotation: NC_000006.10 (201756099..201802354) MIM: 601762

GeneID: 843

37: **CASP9**

Official Symbol: CASP9 and Name: caspase 9, apoptosis-related cysteine peptidase [Homo sapiens]

Other Aliases: RP11-265F14.3, APAF-3, APAF3, CASPASE-9c, ICE-LAP6, MCH6

Other Designations: ICE-like apoptotic protease 6; OTTHUMP00000044594; apoptotic protease MCH-6; apoptotic protease activating factor 3; caspase 9; caspase 9, apoptosis-related cysteine protease

Location: 1p36.3-p36.1

Chromosome: 1

Annotation: NC_000001.9 (15723376..15691377, complement) MIM: 602234

GeneID: 842

38: **CASP8**

Official Symbol: CASP8 and Name: caspase 8, apoptosis-related cysteine peptidase [Homo sapiens]

Other Aliases: ALPS2B, CAP4, FLICE, MACH, MCH5, MGC78473

Other Designations: FADD-homologous ICE/CED-3-like protease; MACH-alpha-1/2/3 protein; MACH-beta-1/2/3/4 protein; Mch5 isoform alpha; caspase 8; caspase 8, apoptosis-related cysteine protease; cysteine protease; procaspase-8

Location: 2q33-q34

Chromosome: 2

Annotation: NC_000002.10 (201806425..201806676) MIM: 602234
601763GeneID: 841
39: **CASP3**
Official Symbol: CASP3 and Name: caspase 3, apoptosis-related cysteine peptidase [Homo sapiens]Other Aliases: CPP32, CPP32B, SCA-1Other Designations: PARP cleavage protease; SREBP cleavage activity 1; Yama; apopain; caspase 3; caspase 3, apoptosis-related cysteine peptidase; cysteine protease CPP32; pro-caspase3Location: 4q34Chromosome: 4 Annotation: NC_000004.10 (185807622..185785843, complement)MIM: 600636GeneID: 836
40: **CCND1**
Official Symbol: CCND1 and Name: cyclin D1 [Homo sapiens]Other Aliases: BCL1, D11S287E, PRAD1, U21B31Other Designations: B-cell CLL/lymphoma 1; G1/S-specific cyclin D1; cyclin D1 (PRAD1: parathyroid adenomatosis 1); parathyroid adenomatosis 1Location: 11q13Chromosome: 11 Annotation: NC_000011.8 (69165053..69178422)MIM: 168461GeneID: 595
41: **BAX**
Central Nervous System genes

1: LOC731472
hypothetical protein LOC731472 [Homo sapiens]Chromosome: 5GeneID: 731472

2: LOC728594
hypothetical protein LOC728594 [Homo sapiens]Location: 5p15.33Chromosome: 5
Annotation: NC_000005.8 (1497667..1498583)GeneID: 728594

3: ANKK1
Official Symbol: ANKK1 and Name: ankyrin repeat and kinase domain containing 1
[Homo sapiens]Other Aliases: PKK2Other Designations: X-kinase; protein kinase PKK2Location: 11q23.1Chromosome: 11Annotation: NC_000011.8
(112763722..112776349)MIM: 608774GeneID: 255239

4: TPH2
Official Symbol: TPH2 and Name: tryptophan hydroxylase 2 [Homo sapiens]Other Aliases: FLJ37295, MGC138871, MGC138872, NTPHOther Designations: neuronal tryptophan hydroxylaseLocation: 12q21.1Chromosome: 12 Annotation: NC_000012.10
(70618892..70712487)MIM: 605210GeneID: 121278

5: DISC1
Official Symbol: DISC1 and Name: disrupted in schizophrenia 1 [Homo sapiens]Other Aliases: RP4-730B13.1, KIAA0457, SCZD9Location: 1q42.1Chromosome: 1 Annotation: NC_000001.9 (229829183..230243640)MIM: 27185

6: TH

7: SLC18A2
Official Symbol: SLC18A2 and Name: solute carrier family 18 (vesicular monoamine), member 2 [Homo sapiens]Other Aliases: MGC120477, MGC120478, MGC26538, SVAT, SVMT, VAT2, VMAT2Other Designations: vesicle monoamine transporter type 2Location: 10q25Chromosome: 10 Annotation: NC_000010.9
(118990705..119027084)MIM: 193001GeneID: 6571

8: SLC6A4
Official Symbol: SLC6A4 and Name: solute carrier family 6 (neurotransmitter transporter, serotonin), member 4 [Homo sapiens]Other Aliases: 5-HTT, 5HTT, HTT, OCD1, SERT, hSERTOther Designations: 5-hydroxytryptamine transporter; 5HT transporter; Na+/Cl- dependent serotonin transporter; serotonin transporter; sodium-dependent serotonin transporter; solute carrier family 6 member 4Location: 17q11.1-q12Chromosome: 17 Annotation: NC_000017.9
(25586830..25549031, complement)MIM: 182138GeneID: 6532

9: SLC6A3
Official Symbol: SLC6A3 and Name: solute carrier family 6 (neurotransmitter transporter, dopamine), member 3 [Homo sapiens]Other Aliases: DAT, DAT1Other Designations: dopamine transporter; variable number tandem repeat (VNTR)Location: 5p15.3Chromosome: 5 Annotation: NC_000005.8 (1498544..1445908, complement)MIM: 126455GeneID: 6531

10: SLC6A2
Official Symbol: SLC6A2 and Name: solute carrier family 6 (neurotransmitter transporter, noradrenaline), member 2 [Homo sapiens]Other Aliases: NAT1, NET, NET1, SLC6A5Other Designations: noradrenaline transporter; norepinephrine transporter; solute carrier family 6 (neurotransmitter transporter, norepinephrine), member 5; solute carrier family 6 member 2Location: 18q12.2Chromosome: 18 Annotation: NC_000018.8 (54248056..54295200)MIM: 163970GeneID: 6530

11: MAOB
Official Symbol: MAOB and Name: monoamine oxidase B [Homo sapiens]Other Aliases: RP1-201D17__B.1, MGC26382Other Designations: MAO, brain; MAO, platelet; adrenalin oxidase; amine oxidase (flavin-containing); tyramine oxidaseLocation: Xp11.23Chromosome: X Annotation: NC_000023.9 (43626624..43510800,
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<th>Gene</th>
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<th>Name</th>
<th>Chromosome</th>
<th>Annotation</th>
<th>MIM</th>
<th>GeneID</th>
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<tr>
<td>14: ESR1</td>
<td>Official Symbol: ESR1 and Name: estrogen receptor 1 [Homo sapiens]Other Aliases: RP1-130E4.1, DKFZp686N23123, ER, ESR, ESRA, Era, NR3A1Other Designations: dJ443C4.1.1 (estrogen receptor 1); estrogen receptor 1 (alpha); oestrogen receptor; steroid hormone receptor</td>
<td>ESR1 and Name: estrogen receptor 1 [Homo sapiens]Other Aliases: RP1-130E4.1, DKFZp686N23123, ER, ESR, ESRA, Era, NR3A1Other Designations: dJ443C4.1.1 (estrogen receptor 1); estrogen receptor 1 (alpha); oestrogen receptor; steroid hormone receptorLocation: 6q25.1Chromosome: 6 Annotation: NC_000006.10 (152170378..152466098)</td>
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<td>NC_000006.10</td>
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<td>2099</td>
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<td>15: DRD3</td>
<td>Official Symbol: DRD3 and Name: dopamine receptor D3 [Homo sapiens]Other Aliases: D3DR, ETM1, FET1, MGC149204, MGC149205Other Designations: essential tremor 1Location: 3q13.3Chromosome: 3</td>
<td>DRD3 and Name: dopamine receptor D3 [Homo sapiens]Other Aliases: D3DR, ETM1, FET1, MGC149204, MGC149205Other Designations: essential tremor 1Location: 3q13.3Chromosome: 3</td>
<td>3q13.3</td>
<td>NC_000003.10</td>
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<td>16: DRD2</td>
<td>Official Symbol: DRD2 and Name: dopamine receptor D2 [Homo sapiens]Other Aliases: D2DR, D2ROther Designations: seven transmembrane helix receptor</td>
<td>DRD2 and Name: dopamine receptor D2 [Homo sapiens]Other Aliases: D2DR, D2ROther Designations: seven transmembrane helix receptor</td>
<td>11q23</td>
<td>NC_000011.8</td>
<td>126450</td>
<td>1813</td>
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<td>17: DAO</td>
<td>Official Symbol: DAO and Name: D-amino-acid oxidase [Homo sapiens]Other Aliases: DAAO, DAMOX, MGC35381, OXDALocation: 12q24Chromosome: 12 Annotation: NC_000012.10 (107797995..107818825)</td>
<td>DAO and Name: D-amino-acid oxidase [Homo sapiens]Other Aliases: DAAO, DAMOX, MGC35381, OXDALocation: 12q24Chromosome: 12</td>
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<td>NC_000012.10 (107797995..107818825)</td>
<td>124050</td>
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<td>18: COMT</td>
<td>Official Symbol: COMT and Name: catechol-O-methyltransferase [Homo sapiens]Other Aliases: DAAC, DAOM, MGC35381, OXDALocation: 12q24Chromosome: 12 Annotation: NC_000012.10 (107797995..107818825)</td>
<td>COMT and Name: catechol-O-methyltransferase [Homo sapiens]Other Aliases: DAAC, DAOM, MGC35381, OXDALocation: 12q24Chromosome: 12</td>
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<td>NC_000012.10 (107797995..107818825)</td>
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<td>19: CHRNA4</td>
<td>Official Symbol: CHRNA4 and Name: cholinergic receptor, nicotinic, alpha 4 [Homo sapiens]Other Aliases: BFNC, EBN, EBN1, NACRA4Other Designations: cholinergic receptor, nicotinic, alpha 4 subunit; cholinergic receptor, nicotinic, alpha polypeptide 4; neuronal acetylcholine receptor alpha 4 subunit; neuronal nicotinic acetylcholine receptor alpha-4 subunitLocation: 20q13.2-q13.3</td>
<td>CHRNA4 and Name: cholinergic receptor, nicotinic, alpha 4 [Homo sapiens]Other Aliases: BFNC, EBN, EBN1, NACRA4Other Designations: cholinergic receptor, nicotinic, alpha 4 subunit; cholinergic receptor, nicotinic, alpha polypeptide 4; neuronal acetylcholine receptor alpha 4 subunit; neuronal nicotinic acetylcholine receptor alpha-4 subunitLocation: 20q13.2-q13.3</td>
<td>20q13.2-q13.3</td>
<td>NC_000020.9 (61463191..61445108, complement)</td>
<td>118504</td>
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Coronary Artery Disease genes

1: CCL2
Official Symbol: CCL2 and Name: chemokine (C-C motif) ligand 2 [Homo sapiens] Other Aliases: GDCF-2, GDCF-2 HC11, HC11, HSMCR30, MCAF, MCP-1, MCP1, MGC9434, SCYA2, SMC-CF Other Designations: monocyte chemotactic and activating factor; monocyte chemotactic protein 1 (MCP1); homologous to mouse Sig-je; monocyte secretary protein JE; small inducible cytokine A2; small inducible cytokine A2 (monocyte chemotactic protein 1, homologous to mouse Sig-je); small inducible cytokine subfamily A (Cys-Cys), member 2 Location: 17q11.2-q12 Chromosome: 17 Annotation: NC_000017.9 (29606408..29608334) MIM: 158105 GeneID: 6347

2: PON1

3: PLA2G1B
Official Symbol: PLA2G1B and Name: phospholipase A2, group IB (pancreas) [Homo sapiens] Other Aliases: MGC119834, MGC119835, PLA2, PLA2A, PLA2A Other Designations: phospholipase A2, group IB Location: 12q23-q24.1 Chromosome: 12 Annotation: NC_00012.10 (119249974..119244296, complement) MIM: 172410 GeneID: 5319

4: NOS3

5: MTHFR
Official Symbol: MTHFR and Name: 5,10-methylenetetrahydrofolate reductase (NADPH) [Homo sapiens] Other Designations: Methylenetetrahydrofolate reductase; methylenetetrahydrofolate reductase intermediate form Location: 1p36.3 Chromosome: 1 Annotation: NC_000001.9 (11788701..11768373, complement) MIM: 607093 GeneID: 4524

6: MMP3
Official Symbol: MMP3 and Name: matrix metallopeptidase 3 (stromelysin 1, progelatinase) [Homo sapiens] Other Aliases: MGC126102, MGC126103, MGC126104, MMP-3, SL-1, STMY, STMY1, STR1 Other Designations: matrix metalloproteinase 3; matrix metalloproteinase 3 (stromelysin 1, progelatinase); progelatinase; proteoglycanase; stromelysin 1, trans-in-1 Location: 11q22.3 Chromosome: 11 Annotation: NC_000011.8 (102219551..102211737, complement) MIM: 185250 GeneID: 4314

7: LIPC

8: CETP

9: APOE
Official Symbol: APOE and Name: apolipoprotein E [Homo sapiens] Other Aliases: AD2, MGC1571, apoprotein Other Designations: Alzheimer disease 2 (APOE*E4-associated, late onset); apolipoprotein E3 Location: 19q13.2 Chromosome: 19 Annotation: NC_000019.8 (50100878..50104489) MIM: 107741 GeneID: 348

10: ALOX5
Official Symbol: ALOX5 and Name: arachidonate 5-lipoxygenase [Homo sapiens] Other Aliases: RP11-67C2.3, 5-LO, 5LPG, LOG5, MGC163204 Other Designations: arachidonic acid 5-lipoxygenase; leukotriene A4 synthase Location: 10q11.2 Chromosome: 10
Coronary artery disease genes

Annotation: NC_000010.9 (45189634..45261570)MIM: 152390GeneID: 240
11: **ABCA1**
Official Symbol: ABCA1 and Name: ATP-binding cassette, sub-family A (ABC1), member 1 [Homo sapiens]Other Aliases: ABC-1, ABC1, CERP, FLJ14958, HDLDT1, TGDOther Designations: ATP binding cassette transporter 1; ATP-binding cassette 1; ATP-binding cassette transporter-1; ATP-binding cassette, sub-family A member 1; cholesterol efflux regulatory protein; high density lipoprotein deficiency, Tangier type, 1; membrane-boundLocation: 9q31.1Chromosome: 9 Annotation: NC_000009.10 (106730256..106583103, complement)MIM: 600046GeneID: 19