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- (54) Title: GENE EXPRESSION SIGNATURE IN SKIN PREDICTS RESPONSE TO MYCOPHENOLATE MOFETIL

(57) Abstract: Described herein are methods and compositions for identifying patients with SSc or scleroderma who are responders to MMF treatment.

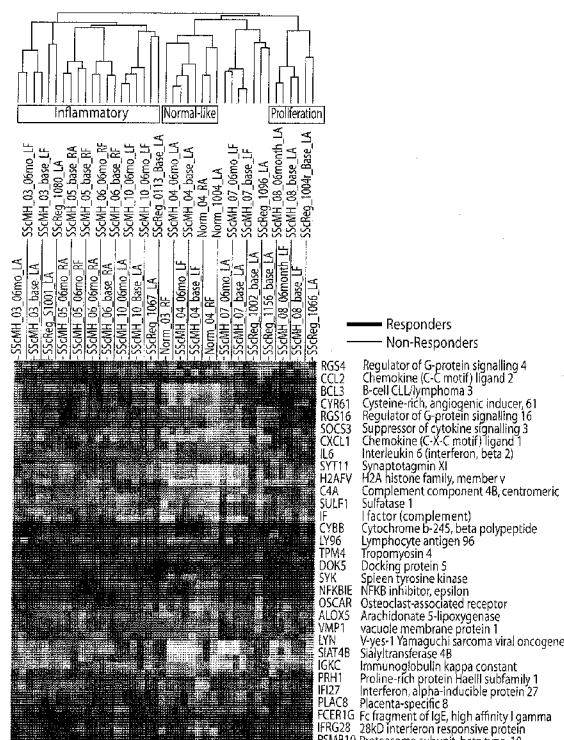


Fig. 1



OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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**GENE EXPRESSION SIGNATURE IN SKIN PREDICTS RESPONSE TO
MYCOPHENOLATE MOFETIL**

GOVERNMENT FUNDING

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RELATED APPLICATION

This application claims the benefit of the filing date of U.S. provisional application USSN 61/447,545, filed February 28, 2011. The referenced application is incorporated herein by reference in its entirety.

FIELD

The present invention is directed generally to methods for identifying mycophenolate mofetil (MMF)-responsive patients diagnosed with systemic sclerosis (SSc)/scleroderma. In particular, the invention relates to the identification of gene expression signatures or molecular profiles of skin, which correlate with a SSc/scleroderma patient's responsiveness to treatment with MMF.

BACKGROUND

Systemic sclerosis (SSc)/scleroderma is a phenotypically diverse autoimmune disease of unknown etiology with a clinical hallmark of skin and internal organ fibrosis. Skin tightening and internal organ dysfunction cause considerable morbidity and mortality in those with SSc, respectively. Patients are prescribed various experimental treatments, including mycophenolate mofetil (MMF) (*e.g.*, CELLCEPT[®], Roche), an immunosuppressant, to halt and/or reverse skin and lung disease. Response to treatment is variable.

MMF inhibits inosine monophosphate dehydrogenase, the enzyme that controls the rate of synthesis of guanine monophosphate in the *de novo* pathway of purine synthesis used in the proliferation of B and T lymphocytes. Inhibition of the enzyme results in alteration of cell-mediated immunity and antibody formation [Ransom, J.T., *Therapeutic Drug Monitoring*, 1995. 17(6): p. 681-4]. MMF is a well-tolerated, safe, and FDA-approved medication for the prevention and treatment of solid organ transplant rejection. Its off-label

indications include treatment for lupus nephritis, idiopathic thrombocytopenic purpura, Wegener's granulomatosis, myasthenia gravis and psoriasis, which are diseases that are thought to result in part from immune system activation. Because allograft vasculopathy resembles the vasculopathy that occurs in SSc, and because allograft vasculopathy is thought to play a major role in allograft rejection, MMF has been used in transplant recipients and SSc patients. Further evidence that supports a role for MMF in the treatment of SSc includes the ability of MMF to inhibit neointimal hyperplasia and prevent collagen production [Roos, N., et al., *J Pharmacol Exp Ther*, 2007. 321(2): p. 583-9; Schwarze, M.L., et al., *J Heart Lung Transplant*, 2001. 20(2): p. 160].

The modified Rodnan Skin Score (mRSS) is a validated marker of skin disease in SSc [Clements, P.J., et al., *J Rheumatol*, 1993. 20(11): p. 1892-6]. Improvement in the score is associated with improved survival. It appears to improve in some patients taking MMF. Lung function and radiographic findings improve in some patients prescribed MMF. Case reports and retrospective studies suggest that MMF may effectively treat SSc skin and lung disease in some patients, but the response is variable and there is no biomarker capable of predicting response to MMF treatment [Plastiras, S.C. et al, *Rheumatology*, 2006. 45(12): p. 1572; Derk, C.T., et al., *Rheumatology* (Oxford), 2009. 48(12): p. 1595-9; Gerbino, A.J., et al., *Chest*, 2008. 133(2): p. 455-60; Herrick, A.L., et al., *Journal of Rheumatology*, 2010. 37(1): p. 116-24; Stratton, R.J., et al., *Rheumatology* (Oxford), 2001. 40(1): p. 84-8; Vanthuyne, M., et al., *Clin Exp Rheumatol*, 2007. 25(2): p. 287-92; Miniati, I., et al., *Clinical and Experimental Rheumatology*, 2007. 25(2): p. 169-71].

SUMMARY

Described herein are methods and compositions for identifying patients with SSc who are likely to respond to MMF treatment.

In one embodiment, the method is a method of determining if a patient having SSc or scleroderma is a responder to MMF treatment or a non-responder to MMF treatment, comprising obtaining a gene expression signature (patient gene expression signature) from skin obtained from a patient (referred to as a patient to be assessed); and determining if the patient gene expression signature comprises increased expression of one or more (at least one) genes selected from A2M, AIF1, ALOX5AP, APOL2, APOL3, BATF, BCL3, BIRC1, BTN3A2, C10orf10, C1orf38, C6orf80, CCL2, CCL4, CCR5, CD8A, CDW52, COL6A3, COTL1, CPA3, CPVL, CTAG1B, DDX58, EBI2, EVI2B, F13A1, FAM20A, FAP,

FCGR3A, FLJ11259, FLJ22573, FLJ23221, FLJ25200, FYB, GBP1, GBP3, GEM, GIMAP6, GMFG, GZMH, GZMK, HAVCR2, HCLS1, HLA-DMA, HLA-DOA, HLA-DPA1, HLA-DPB1, HLA-DQA1, HLA-DQA2, HLA-DQB1, HLA-DRB1, HLA-DRB5, ICAM2, IFI16, IFIT1, IFIT2, IFITM1, IFITM2, IFITM3, IL10RA, INDO, ITGB2, KIAA0063, LAMB1, LCP1, LGALS2, LGALS9, LILRB2, LOC387763, LOC400759, LUM, LYZ, MARCKS, MFNG, MGC24133, MPEG1, MRC1, MRCL3, MS4A6A, MX1, NNMT, NUP62, PAG, PLAUI, PPIC, PTPRC, RAC2, RGS10, RGS16, RSAFD1, SAT, SCGB2A1, SLC20A1, SLCO2B1, SPARC, SULF1, TAP1, TCTEL1, TIMP1, TNFSF4, UBD, VSIG4, and ZFYVE26 compared to expression of the gene in a control sample, wherein increased expression of one or more of the genes in the patient gene signature classifies the patient as a MMF treatment responder. A patient skin sample used in the method can be referred to as a test genetic sample. If the patient gene signature does not comprise increased expression of one or more (at least one) genes from the group above (does not have a gene expression signature indicative of being a MMF treatment responder, as described herein), the patient is classified as a MMF treatment non-responder. Alternatively, the patient gene expression signature can be assessed to determine if it comprises increased expression of one or more (at least one) genes herein as genes within Group III (see below).

In an alternative embodiment, the method of determining if a patient having SSc or scleroderma is a responder to MMF treatment or a non-responder to MMF treatment, comprises obtaining a gene expression signature (patient gene expression signature) from skin obtained from a patient (referred to as a patient to be assessed); and determining if the patient gene expression signature comprises increased expression of one or more (at least one) genes (referred to herein as genes within Group II) selected from the following: genes, identified by name: AADAC, ADAM17, ADH1A, ADH1C, AHNAK, ALG1, ALG5, AMOT, AOX1, AP2A2, ARK5, ARL6IP5, ARMCX1, BECN1, BECN1, BMP8A, BNIP3L, C10orf119, C1orf24, C1orf37, C20orf10, C20orf22, C5orf14, C6orf64, C9orf61, CAPS, CASP4, CASP5, CAST, CAV2, CCDC6, CCNG2, CDC26, CDK2AP1, CDR1, CFHL1, CNTN3, CPNE5, CRTAP, CTNNA1, CTSC, CUTL1, CXCL5, CYBRD1, CYP2R1, DBN1, DCAMKL1, DCL-1, DIAPH2, DKK2, ECHDC3, ECM2, EIF3S7, EMB, EMCN, EMILIN2, ENPP2, EPB41L2, FBLN1, FBLN2, FEM1A, FGL2, FHL5, FKBP7, FLI1, FLJ10986, FLJ20032, FLJ20701, FLJ23861, FLJ34969, FLJ36748, FLJ36888, FLJ43339, FZR1, GABPB2, GARNL4, GHITM, GHR, GIT2, GLYAT, GPM6B, GTPBP5, HELB, HOXB4, IFNA6, IGFBP5, IL13RA1, IL15, KAZALD1, KCNK4, KCNS3, KCTD10, KIAA0232,

KIAA0494, KIAA0562, KIAA0870, KIAA1190, KIF25, KLHL18, KLK2, LAMP2, LEPROTL1, LHFP, LMO2, LOC114990, LOC255458, LOC387680, LOC400027, LOC493869, LOC87769, LRBA, MAFB, MAGEH1, MAN2B2, MCCC2, MEGF10, MFAP5, MGC11308, MGC15523, MGC3200, MGC35048, MGC45780, MOGAT3, MPPE1, MPZ, MYO1B, MYOC, NFYC, NIPSNAP3B, OPTN, OSR2, PAM, PBXIP1, PCOLCE2, PDGFC, PDGFRA, PDGFRL, PEX19, PHAX, PIP, PKM2, PKP2, PMP22, POU2F1, PPAP2B, PRAC, PSMA5, PSORS1C1, PTGIS, RECK, RGS11, RGS5, RIMS3, RIPK2, RNASE4, RNF125, RNF13, RNF146, RNF19, ROBO1, ROBO3, RPL7A, SARA1, SAV1, SCGB1D1, SDK1, SECP43, SECTM1, SERPINB2, SGCA, SH3BGRL, SH3GLB1, SH3RF2, SLC10A3, SLC12A2, SLC14A1, SLC39A14, SLC7A7, SLC9A9, SLPI, SMAD1, SMAP1, SMARCE1, SMP1, SNTG2, SNX7, SOCS5, SSPN, STX7, SUMF1, TAS2R10, TDE2, TFAP2B, TGFB2, THSD2, TM4SF3, TMEM25, TMEM34, TNA, TNKS2, TRAD, TRAF3IP1, TREM4, TRIM35, TRIM9, TTYH2, TUBB1, UBL3, ULK2, URB, USP54, UST, UTRN, UTX, WIF1, WWOX, XG, YPEL5, and ZFHX1B and genes, each identified by GenBank accession number only: A_32_BS169243, A_32_BS200773, A_32_BS53976, AC025463, AF124368, AF161364, AF318337, AF372624, AK001565, AK022793, AK055621, AK056856, AL050042, AL137761, BC035102, BC038761, BC039664, BG252130, BI014689, D80006, ENST00000298643, ENST00000300068, ENST00000305402, ENST00000307901, ENST00000321656, ENST00000322803, ENST00000329246, ENST00000331640, ENST00000332271, ENST00000333784, H16080, I_1861543, I_1882608, I_1985061, I_3335767, I_3551568, I_3588329, I_932413, I_962800, I_966091, NM_001008528, NM_001009555, NM_001013632, NM_001014975, NM_001018006, NM_001018076, NM_001025077, NM_003671, NM_014758, NM_015262, NM_138411, NM_153030, NM_173709, NM_213595, NR_002184, S62210, THC1419743, THC1429821, THC1457118, THC1459712, THC1461073, THC1506312, THC1511927, THC1515028, THC1525318, THC1531579, THC1544941, THC1551463, THC1559236, THC1560798, THC1563147, THC1572906, THC1574967, THC1591470, XM_165930, and XM_209429, compared to expression of the gene in a control sample, wherein increased expression of one or more of the genes in the patient gene signature classifies the patient as a MMF treatment responder. If the patient gene signature does not comprise increased expression of one or more (at least one) genes from the group above (does not have a gene expression signature indicative of being a MMF treatment responder, as described herein), the patient is classified as a MMF treatment non-responder.

In a further embodiment, the method of determining if a patient having SSc or scleroderma is a responder to MMF treatment or a non-responder to MMF treatment, comprises obtaining a gene expression signature (patient gene expression signature) from skin obtained from a patient (referred to as a patient to be assessed); and determining if the patient gene expression signature comprises decreased expression of one or more genes (referred to herein as genes within Group I) selected from the following: genes, each identified by name: ANP32A, APOH, ATAD2, B3GALT6, B3GAT3, C12orf14, C14orf131, CACNG6, CBLL1, CBX8, CDC7, CDT1, CENPE, CGI-90, CLDN6, CREB3L3, CROC4, DDX3Y, DERP6, DJ971N18.2, EHD2, ESPL1, FGF5, FLJ10902, FLJ12438, FLJ12443, FLJ12484, FLJ12572, FLJ20245, FLJ32009, FLJ35757, FXYD2, GABRA2, GATA2, GK, GSG2, HPS3, IKBKG, IL23A, INSIG1, KIAA1509, KIAA1609, KIAA1666, LDLR, LGALS8, LILRB5, LOC123876, LOC128977, LOC153561, LOC283464, LRRIQ2, LY6K, MAC30, ME2, MGC13186, MGC16044, MGC16075, MGC29784, MGC33839, MGC35212, MGC4293, MICB, MLL5, MTRF1L, MUC20, NICN1, NPTX1, OAS3, OGDHL, OPRK1, PCNT2, PDZK1, PITPNC1, PPFIA4, PREB, PRKY, PSMD11, PSPH, PSPHL, PTP4A3, PXMP2, RAB15, RAD51AP1, RIP, RNF121, RPL41, RPS18, RPS4Y1, RPS4Y2, S100P, SORD, SP1, SYMPK, SYT6, TM9SF4, TMOD3, TNFRSF12A, TPRA40, TRIP, TRPM7, TTR, TUBB4, VARS2L, ZNF572, and ZSCAN2 and genes, each identified by GenBank accession number: A_24_BS934268, AB065507, AC007051, AI791206, AK022745, AK022893, AK022997, AK094044, AL391244, AL731541, AL928970, BC010544, BC020847, BM925639, BM928667, ENST00000328708, ENST00000333517, I_1891291, I_3580313, NM_001009569, NM_001024808, NM_172020, NM_173705, NM_178467, NR_001544, THC1434038, THC1484458, THC1504780, U62539, XM_210579, XM_303638, and XM_371684, compared to expression of the gene in a control sample, wherein decreased expression of one or more of the genes in the patient gene signature classifies the patient as a MMF treatment responder. If the patient gene signature does not comprise decreased expression of one or more (at least one) genes from the group above (does not have a gene expression signature indicative of being a MMF treatment responder), the patient is classified as a MMF treatment non-responder.

Alternatively, the method of determining if a patient having SSc or scleroderma is a responder to MMF treatment or a non-responder to MMF treatment, comprises obtaining a gene expression signature (patient gene expression signature) from skin obtained from a patient (referred to as a patient to be assessed); and determining if the patient gene expression

signature comprises: (a) increased expression of any one or more genes in Group III and decreased expression of any one or more genes in Group I; (b) increased expression of any one or more genes in Group III and increased expression of any one or more genes in Group II; or increased expression of any one or more genes in Group III, decreased expression of any one or more genes in Group I and increased expression of any one or more genes in Group II.

In a further embodiment of a method of determining if a patient having Systemic Sclerosis (SSc) or scleroderma (referred to as a patient to be assessed) is a responder to mycophenolate mofetil (MMF) treatment or a non-responder to MMF treatment, the method comprises: (a) comparing a gene expression signature obtained from skin of a patient having SSc or scleroderma (patient gene expression signature) to a gene expression signature that is characteristic of a responder to MMF treatment (to a responder gene expression signature) and (b) based on results of comparing in (a), determining if the patient is a responder or a non-responder to MMF treatment. If the patient gene expression signature is sufficiently similar to the responder gene expression signature, the patient to be assessed is a responder to MMF treatment. For example, a patient gene expression signature is compared with a responder gene expression signature that comprises increased expression of at least one of the following: A2M, AIF1, ALOX5AP, APOL2, APOL3, BATF, BCL3, BIRC1, BTN3A2, C10orf10, C1orf38, C6orf80, CCL2, CCL4, CCR5, CD8A, CDW52, COL6A3, COTL1, CPA3, CPVL, CTAG1B, DDX58, EBI2, EVI2B, F13A1, FAM20A, FAP, FCGR3A, FLJ11259, FLJ22573, FLJ23221, FLJ25200, FYB, GBP1, GBP3, GEM, GIMAP6, GMFG, GZMH, GZMK, HAVCR2, HCLS1, HLA-DMA, HLA-DOA, HLA-DPA1, HLA-DPB1, HLA-DQA1, HLA-DQA2, HLA-DQB1, HLA-DRB1, HLA-DRB5, ICAM2, IFI16, IFIT1, IFIT2, IFITM1, IFITM2, IFITM3, IL10RA, INDO, ITGB2, KIAA0063, LAMB1, LCP1, LGALS2, LGALS9, LILRB2, LOC387763, LOC400759, LUM, LYZ, MARCKS, MFNG, MGC24133, MPEG1, MRC1, MRCL3, MS4A6A, MX1, NNMT, NUP62, PAG, PLAU, PPIC, PTPRC, RAC2, RGS10, RGS16, RSAFD1, SAT, SCGB2A1, SLC20A1, SLCO2B1, SPARC, SULF1, TAP1, TCTEL1, TIMP1, TNFSF4, UBD, VSIG4, and ZFYVE26 and, if expression of at least one (one or more) gene(s) in the sample obtained from the patient (in the patient gene expression signature) is substantially the same as expression in the responder gene expression signature (is increased to the same extent or greater extent, compared to expression in a control sample, as the increased expression in the responder gene expression signature), the patient is classified as a MMF responder.

Alternatively, the patient gene expression signature is compared with a responder gene expression signature that comprises increased expression of one or more (at least one) genes (referred to herein as genes within Group II) selected from the following: genes, identified by name: AADAC, ADAM17, ADH1A, ADH1C, AHNAK, ALG1, ALG5, AMOT, AOX1, AP2A2, ARK5, ARL6IP5, ARMCX1, BECN1, BECN1, BMP8A, BNIP3L, C10orf119, C1orf24, C1orf37, C20orf10, C20orf22, C5orf14, C6orf64, C9orf61, CAPS, CASP4, CASP5, CAST, CAV2, CCDC6, CCNG2, CDC26, CDK2AP1, CDR1, CFHL1, CNTN3, CPNE5, CRTAP, CTNNA1, CTSC, CUTL1, CXCL5, CYBRD1, CYP2R1, DBN1, DCAMKL1, DCL-1, DIAPH2, DKK2, ECHDC3, ECM2, EIF3S7, EMB, EMCN, EMILIN2, ENPP2, EPB41L2, FBLN1, FBLN2, FEM1A, FGL2, FHL5, FKBP7, FLI1, FLJ10986, FLJ20032, FLJ20701, FLJ23861, FLJ34969, FLJ36748, FLJ36888, FLJ43339, FZR1, GABPB2, GARNL4, GHITM, GHR, GIT2, GLYAT, GPM6B, GTPBP5, HELB, HOXB4, IFNA6, IGFBP5, IL13RA1, IL15, KAZALD1, KCNK4, KCNS3, KCTD10, KIAA0232, KIAA0494, KIAA0562, KIAA0870, KIAA1190, KIF25, KLHL18, KLK2, LAMP2, LEPROTL1, LHFP, LMO2, LOC114990, LOC255458, LOC387680, LOC400027, LOC493869, LOC87769, LRBA, MAFB, MAGEH1, MAN2B2, MCCC2, MEGF10, MFAP5, MGC11308, MGC15523, MGC3200, MGC35048, MGC45780, MOGAT3, MPPE1, MPZ, MYO1B, MYOC, NFYC, NIPSNAP3B, OPTN, OSR2, PAM, PBXIP1, PCOLCE2, PDGFC, PDGFRA, PDGFRL, PEX19, PHAX, PIP, PKM2, PKP2, PMP22, POU2F1, PPAP2B, PRAC, PSMA5, PSORS1C1, PTGIS, RECK, RGS11, RGS5, RIMS3, RIPK2, RNASE4, RNF125, RNF13, RNF146, RNF19, ROBO1, ROBO3, RPL7A, SARA1, SAV1, SCGB1D1, SDK1, SECP43, SECTM1, SERPINB2, SGCA, SH3BGRL, SH3GLB1, SH3RF2, SLC10A3, SLC12A2, SLC14A1, SLC39A14, SLC7A7, SLC9A9, SLPI, SMAD1, SMAP1, SMARCE1, SMP1, SNTG2, SNX7, SOCS5, SSPN, STX7, SUMF1, TAS2R10, TDE2, TFAP2B, TGFBR2, THSD2, TM4SF3, TMEM25, TMEM34, TNA, TNKS2, TRAD, TRAF3IP1, TREM4, TRIM35, TRIM9, TTYH2, TUBB1, UBL3, ULK2, URB, USP54, UST, UTRN, UTX, WIF1, WWOX, XG, YPEL5, and ZFHX1B and genes, each identified by GenBank accession number: A_32_BS169243, A_32_BS200773, A_32_BS53976, AC025463, AF124368, AF161364, AF318337, AF372624, AK001565, AK022793, AK055621, AK056856, AL050042, AL137761, BC035102, BC038761, BC039664, BG252130, BI014689, D80006, ENST00000298643, ENST00000300068, ENST00000305402, ENST00000307901, ENST00000321656, ENST00000322803, ENST00000329246, ENST00000331640, ENST00000332271, ENST00000333784, H16080,

I_1861543, I_1882608, I_1985061, I_3335767, I_3551568, I_3588329, I_932413, I_962800, I_966091, NM_001008528, NM_001009555, NM_001013632, NM_001014975, NM_001018006, NM_001018076, NM_001025077, NM_003671, NM_014758, NM_015262, NM_138411, NM_153030, NM_173709, NM_213595, NR_002184, S62210, THC1419743, THC1429821, THC1457118, THC1459712, THC1461073, THC1506312, THC1511927, THC1515028, THC1525318, THC1531579, THC1544941, THC1551463, THC1559236, THC1560798, THC1563147, THC1572906, THC1574967, THC1591470, XM_165930, and XM_209429, compared to expression of the gene in a control sample, wherein increased expression of one or more of the genes in the patient gene signature classifies the patient as a MMF treatment responder. If the patient gene signature does not comprise increased expression of one or more (at least one) genes from the group above (does not have a gene expression signature indicative of being a MMF treatment responder, as described herein), the patient is classified as a MMF treatment non-responder.

Alternatively, the patient gene expression signature is compared with a responder gene expression signature that comprises decreased expression of one or more (at least one) genes (referred to herein as genes within Group I) selected from the following: genes, each identified by name: ANP32A, APOH, ATAD2, B3GALT6, B3GAT3, C12orf14, C14orf131, CACNG6, CBLL1, CBX8, CDC7, CDT1, CENPE, CGI-90, CLDN6, CREB3L3, CROC4, DDX3Y, DERP6, DJ971N18.2, EHD2, ESPL1, FGF5, FLJ10902, FLJ12438, FLJ12443, FLJ12484, FLJ12572, FLJ20245, FLJ32009, FLJ35757, FXD2, GABRA2, GATA2, GK, GSG2, HPS3, IKBKG, IL23A, INSIG1, KIAA1509, KIAA1609, KIAA1666, LDLR, LGALS8, LILRB5, LOC123876, LOC128977, LOC153561, LOC283464, LRRIQ2, LY6K, MAC30, ME2, MGC13186, MGC16044, MGC16075, MGC29784, MGC33839, MGC35212, MGC4293, MICB, MLL5, MTRF1L, MUC20, NICN1, NPTX1, OAS3, OGDHL, OPRK1, PCNT2, PDZK1, PITPNC1, PPFIA4, PREB, PRKY, PSMD11, PSPH, PSPHL, PTP4A3, PXMP2, RAB15, RAD51AP1, RIP, RNF121, RPL41, RPS18, RPS4Y1, RPS4Y2, S100P, SORD, SP1, SYMPK, SYT6, TM9SF4, TMOD3, TNFRSF12A, TPRA40, TRIP, TRPM7, TTR, TUBB4, VARS2L, ZNF572, and ZSCAN2 and genes, each identified by GenBank accession number: A_24_BS934268, AB065507, AC007051, AI791206, AK022745, AK022893, AK022997, AK094044, AL391244, AL731541, AL928970, BC010544, BC020847, BM925639, BM928667, ENST00000328708, ENST00000333517, I_1891291, I_3580313, NM_001009569, NM_001024808, NM_172020, NM_173705, NM_178467, NR_001544, THC1434038, THC1484458, THC1504780, U62539,

XM_210579, XM_303638, and XM_371684, , compared to expression of the gene in a control sample, wherein decreased expression of one or more of the genes in the patient gene signature classifies the patient as a MMF treatment responder. If the patient gene signature does not comprise decreased expression of one or more (at least one) genes from the group above (does not have a gene expression signature indicative of being a MMF treatment responder, as described herein), the patient is classified as a MMF treatment non-responder.

In all embodiments of the method described herein, a gene expression signature is obtained from a sample, such as a skin sample, obtained from an individual and assessed using methods known to those of skill in the art, as discussed further herein. The skin sample can be obtained from a variety of locations and in some embodiments, is obtained from the arm of the back.

Also described herein are nucleic acid (DNA, RNA) microarrays, such as a nucleic acid micorarray comprising nucleic acids that hybridize to at least one gene selected from Group III or to a complement of at least one gene selected from Group III, a gene selected from Group II or to a complement thereof, and a gene selected from Group I or to a complement thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

The patent or patent application contains at least one drawing executed in color. Copies of this patent or patent application publication with color drawing(s) will be provided by the Office upon request and payment of the necessary fee.

FIG. 1 shows unsupervised hierarchical clustering analysis of the inflammatory genes that identify the inflammatory intrinsic subset of SSc.

FIG. 2A shows differences in gene expression in skin samples excised from the arm between responders and non-responders at baseline as demonstrated by SAM and cluster analysis.

FIG. 2B shows differences in gene expression in skin samples excised from the back between responders and non-responders at baseline as demonstrated by SAM and cluster analysis

DETAILED DESCRIPTION

Gene expression analysis by DNA microarrays is a useful approach for identifying novel SSc biomarkers that are capable of meaningfully classifying patients into distinct molecularly defined subsets. A growing body of evidence suggests that DNA microarray analyses of skin may identify useful SSc biomarkers. Published studies have identified SSc gene expression signatures in skin that reliably distinguish patients from healthy individuals and correlate with mRSS [Gardner, H., et al., *Arthritis Rheum*, 2006. 54(6): p. 1961-73; Whitfield, M.L., et al., *Proc Natl Acad Sci U S A*, 2003. 100(21): p. 12319-24; Milano, A., et al., *PLoS One*, 2008. 3(7): p. e2696; Sargent, J.L., et al., *Curr Rheumatol Rep*, 2008. 10(3): p. 205-11] Pendergrass, S.A. et al., *J.Invest.Derm.* 2012 Feb 9. Gene expression in skin of patients with SSc has been used by Applicant to identify five molecular subsets of the condition (Diffuse 1, Diffuse 2, Inflammatory, Normal-like and Limited) that help to explain the observed heterogeneity in disease course and response to experimental treatments [Milano, A., et al., *PLoS One*, 2008. 3(7): p. e2696]. A recent study that assessed clinical response to rituximab in SSc patients found no clinical benefit and a lack of significant changes in gene expression in skin biopsies. Pendergrass, S.A. et al., *J.Invest.Derm.* 2012 Feb 9. These findings contrast with the results of a small study that reported clinical improvement in skin and lung disease in two patients treated with 6 months of imatinib mesylate (*e.g.*, GLEEVEC[®], Novartis). Another experimental treatment for SSc identified biologically relevant changes in skin gene expression that coincided with improvement in lung and skin disease [Chung, L., et al., *Arthritis Rheum*, 2009. 60(2): p. 584-91].

Described herein is a method of predicting whether (determining if) a patient with SSc will respond to treatment with MMF, based on assessment of the individual's gene expression signature. As described herein, Applicant has shown that patients with SSc who are responders to MMF treatment (MMF responders) have a gene expression signature that distinguishes them from patients with SSc who do not respond to MMF treatment (MMF nonresponders). The gene expression signature of a patient identified as a MMF treatment responder comprises one or more genes listed in tables and figures included herein. The method comprises comparing a gene expression signature obtained from a sample, such as a skin sample, obtained from a patient having SSc or scleroderma to a gene expression signature standard or reference, and identifying the patient as a responder or non-responder to MMF treatment. In specific embodiments, the gene expression signature obtained from a sample, such as a skin sample, is compared with a gene expression signature standard or

reference that is one or more (at least one, a) gene (such as a gene set) that differentiates (distinguishes) MMF treatment responders from MMF treatment non-responders. For example, one or more genes whose presence or level or expression in patients with SSc who are known MMF treatment responders can be such a standard. For example, the gene expression signature of a patient with SSc can be compared with the genes listed in Table 1, Table 1A, Table 2, Table 3, Table 4 and/or Table 5. For example, the gene expression signature of a patient identified as a responder comprises one or more genes listed in Table 1, Table 1A, Table 2, Table 3, Table 4 and/or Table 5 and the difference in expression of the one or more genes between the patient and the standard is statistically significant. In a further embodiment, the gene expression signature of a patient identified as a responder comprises one or more genes listed in Figure 1 and the difference in expression of the one or more genes between the patient and the standard is statistically significant.

In another embodiment, the standard genome-wide expression signature is obtained from skin of one or more SSc or scleroderma patient who is not responsive to MMF treatment.

Alternatively, the gene expression signature of a patient to be assessed for responsiveness to MMF treatment can be compared with expression of genes in Group I, Group II and/or Group III, as described herein. For example, the gene expression signature of the patient can be assessed for increased expression of one or more genes in Group III, increased expression of one or more genes in Group II, decreased expression of one or more genes in Group I or any combination of the three (e.g., increased expression of one or more genes in Group III and increased expression of one or more genes in Group II).

In specific embodiments, the gene expression signature of a MMF treatment responder comprises at least one gene that categorizes a patient with SSc as in the Inflammatory subtype, as defined by Milano, A. et al., PLoS One, 2008. 3(7); p.e2696 and in co-pending US patent application 13/054,244. These include at least one gene named in any of the following: Table 1, Table 1A, Table 2, Table 3, Table 4 and Table 5 or otherwise presented herein (Example 4: IL-13 and IL-4 Gene Signatures Identify the Inflammatory Subset and the tables included therein)

In specific embodiments, a MMF treatment responder can be identified by the increased expression in a sample obtained from a patient with SSc of one or more genes (referred to in US patent application 13/054,244 and herein as genes within Group III) selected from the following: genes identified by name: A2M, AIF1, ALOX5AP, APOL2,

APOL3, BATF, BCL3, BIRC1, BTN3A2, C10orf10, C1orf38, C6orf80, CCL2, CCL4, CCR5, CD8A, CDW52, COL6A3, COTL1, CPA3, CPVL, CTAG1B, DDX58, EBI2, EVI2B, F13A1, FAM20A, FAP, FCGR3A, FLJ11259, FLJ22573, FLJ23221, FLJ25200, FYB, GBP1, GBP3, GEM, GIMAP6, GMFG, GZMH, GZMK, HAVCR2, HCLS1, HLA-DMA, HLA-DOA, HLA-DPA1, HLA-DPB1, HLA-DQA1, HLA-DQA2, HLA-DQB1, HLA-DRB1, HLA-DRB5, ICAM2, IFI16, IFI16, IFIT1, IFIT2, IFITM1, IFITM2, IFITM3, IL10RA, INDO, ITGB2, KIAA0063, LAMB1, LCP1, LGALS2, LGALS9, LILRB2, LOC387763, LOC400759, LUM, LYZ, MARCKS, MFNG, MGC24133, MPEG1, MRC1, MRCL3, MS4A6A, MX1, NNMT, NUP62, PAG, PLAUI, PPIC, PPIC, PTPRC, RAC2, RGS10, RGS16, RSAFD1, SAT, SCGB2A1, SLC20A1, SLC02B1, SPARC, SULF1, TAP1, TCTEL1, TIMP1, TNFSF4, UBD, VSIG4, and ZFYVE26 and genes, each identified by GenBank accession number: AF533936, BQ049338, ENST00000310210, ENST00000313904, ENST00000329660, I_1000437, I_966691, M15073, NM_001010919, NM_001025201, NM_001033569, THC1543691, and XM_291496.

In further specific embodiments, a MMF treatment responder can be identified by the increased expression in a sample obtained from a patient with SSc of one or more genes (referred to in US patent application 13/054,244 and herein as genes within Group II) selected from the following: genes, identified by name: AADAC, ADAM17, ADH1A, ADH1C, AHNAK, ALG1, ALG5, AMOT, AOX1, AP2A2, ARK5, ARL6IP5, ARMCX1, BECN1, BECN1, BMP8A, BNIP3L, C10orf119, C1orf24, C1orf37, C20orf10, C20orf22, C5orf14, C6orf64, C9orf61, CAPS, CASP4, CASP5, CAST, CAV2, CCDC6, CCNG2, CDC26, CDK2AP1, CDR1, CFHL1, CNTN3, CPNE5, CRTAP, CTNNA1, CTSC, CUTL1, CXCL5, CYBRD1, CYP2R1, DBN1, DCAMKL1, DCL-1, DIAPH2, DKK2, ECHDC3, ECM2, EIF3S7, EMB, EMCN, EMILIN2, ENPP2, EPB41L2, FBLN1, FBLN2, FEM1A, FGL2, FHL5, FKBP7, FLI1, FLJ10986, FLJ20032, FLJ20701, FLJ23861, FLJ34969, FLJ36748, FLJ36888, FLJ43339, FZR1, GABPB2, GARNL4, GHITM, GHR, GIT2, GLYAT, GPM6B, GTPBP5, HELB, HOXB4, IFNA6, IGFBP5, IL13RA1, IL15, KAZALD1, KCNK4, KCNS3, KCTD10, KIAA0232, KIAA0494, KIAA0562, KIAA0870, KIAA1190, KIF25, KLHL18, KLK2, LAMP2, LEPROTL1, LHFP, LMO2, LOC114990, LOC255458, LOC387680, LOC400027, LOC493869, LOC87769, LRBA, MAFB, MAGEH1, MAN2B2, MCCC2, MEGF10, MFAP5, MGC11308, MGC15523, MGC3200, MGC35048, MGC45780, MOGAT3, MPPE1, MPZ, MYO1B, MYOC, NFYC, NIPSNAP3B, OPTN, OSR2, PAM, PBXIP1, PCOLCE2, PDGFC, PDGFRA, PDGFRL, PEX19, PHAX, PIP, PKM2, PKP2,

PMP22, POU2F1, PPAP2B, PRAC, PSMA5, PSORS1C1, PTGIS, RECK, RGS11, RGS5, RIMS3, RIPK2, RNASE4, RNF125, RNF13, RNF146, RNF19, ROBO1, ROBO3, RPL7A, SARA1, SAV1, SCGB1D1, SDK1, SECP43, SECTM1, SERPINB2, SGCA, SH3BGRL, SH3GLB1, SH3RF2, SLC10A3, SLC12A2, SLC14A1, SLC39A14, SLC7A7, SLC9A9, SLPI, SMAD1, SMAP1, SMARCE1, SMP1, SNTG2, SNX7, SOCS5, SSPN, STX7, SUMF1, TAS2R10, TDE2, TFAP2B, TGFBR2, THSD2, TM4SF3, TMEM25, TMEM34, TNA, TNKS2, TRAD, TRAF3IP1, TREM4, TRIM35, TRIM9, TTYH2, TUBB1, UBL3, ULK2, URB, USP54, UST, UTRN, UTX, WIF1, WWOX, XG, YPEL5, and ZFH1B and genes, each identified by GenBank accession number only: A_32_BS169243, A_32_BS200773, A_32_BS53976, AC025463, AF124368, AF161364, AF318337, AF372624, AK001565, AK022793, AK055621, AK056856, AL050042, AL137761, BC035102, BC038761, BC039664, BG252130, BI014689, D80006, ENST00000298643, ENST00000300068, ENST00000305402, ENST00000307901, ENST00000321656, ENST00000322803, ENST00000329246, ENST00000331640, ENST00000332271, ENST00000333784, H16080, I_1861543, I_1882608, I_1985061, I_3335767, I_3551568, I_3588329, I_932413, I_962800, I_966091, NM_001008528, NM_001009555, NM_001013632, NM_001014975, NM_001018006, NM_001018076, NM_001025077, NM_003671, NM_014758, NM_015262, NM_138411, NM_153030, NM_173709, NM_213595, NR_002184, S62210, THC1419743, THC1429821, THC1457118, THC1459712, THC1461073, THC1506312, THC1511927, THC1515028, THC1525318, THC1531579, THC1544941, THC1551463, THC1559236, THC1560798, THC1563147, THC1572906, THC1574967, THC1591470, XM_165930, and XM_209429.

In further specific embodiments, a MMF treatment responder can be identified by the decreased expression in a sample obtained from a patient with SSc of one or more genes (referred to in US patent application 13/054,244 and herein as genes within Group I) selected from the following: genes, each identified by name: ANP32A, APOH, ATAD2, B3GALT6, B3GAT3, C12orf14, C14orf131, CACNG6, CBLL1, CBX8, CDC7, CDT1, CENPE, CGI-90, CLDN6, CREB3L3, CROC4, DDX3Y, DERP6, DJ971N18.2, EHD2, ESPL1, FGF5, FLJ10902, FLJ12438, FLJ12443, FLJ12484, FLJ12572, FLJ20245, FLJ32009, FLJ35757, FXD2, GABRA2, GATA2, GK, GSG2, HPS3, IKBKG, IL23A, INSIG1, KIAA1509, KIAA1609, KIAA1666, LDLR, LGALS8, LILRB5, LOC123876, LOC128977, LOC153561, LOC283464, LRRIQ2, LY6K, MAC30, ME2, MGC13186, MGC16044, MGC16075, MGC29784, MGC33839, MGC35212, MGC4293, MICB, MLL5, MTRF1L, MUC20,

NICN1, NPTX1, OAS3, OGDHL, OPRK1, PCNT2, PDZK1, PITPNC1, PPFIA4, PREB, PRKY, PSMD11, PSPH, PSPHL, PTP4A3, PXMP2, RAB15, RAD51AP1, RIP, RNF121, RPL41, RPS18, RPS4Y1, RPS4Y2, S100P, SORD, SP1, SYMPK, SYT6, TM9SF4, TMOD3, TNFRSF12A, TPRA40, TRIP, TRPM7, TTR, TUBB4, VARS2L, ZNF572, and ZSCAN2 and genes, each identified by GenBank accession number: A_24_BS934268, AB065507, AC007051, AI791206, AK022745, AK022893, AK022997, AK094044, AL391244, AL731541, AL928970, BC010544, BC020847, BM925639, BM928667, ENST00000328708, ENST00000333517, I_1891291, I_3580313, NM_001009569, NM_001024808, NM_172020, NM_173705, NM_178467, NR_001544, THC1434038, THC1484458, THC1504780, U62539, XM_210579, XM_303638, and XM_371684.

In one embodiment, increased expression of one or more genes selected from A2M, AIF1, ALOX5AP, APOL2, APOL3, BATF, BCL3, BIRC1, BTN3A2, C10orf10, C1orf38, C6orf80, CCL2, CCL4, CCR5, CD8A, CDW52, COL6A3, COTL1, CPA3, CPVL, CTAG1B, DDX58, EBI2, EVI2B, F13A1, FAM20A, FAP, FCGR3A, FLJ11259, FLJ22573, FLJ23221, FLJ25200, FYB, GBP1, GBP3, GEM, GIMAP6, GMFG, GZMH, GZMK, HAVCR2, HCLS1, HLA-DMA, HLA-DOA, HLA-DPA1, HLA-DPB1, HLA-DQA1, HLA-DQA2, HLA-DQB1, HLA-DRB1, HLA-DRB5, ICAM2, IFI16, IFIT1, IFIT2, IFITM1, IFITM2, IFITM3, IL10RA, INDO, ITGB2, KIAA0063, LAMB1, LCPI, LGALS2, LGALS9, LILRB2, LOC387763, LOC400759, LUM, LYZ, MARCKS, MFNG, MGC24133, MPEG1, MRC1, MRCL3, MS4A6A, MX1, NNMT, NUP62, PAG, PLA1, PPIC, PTPRC, RAC2, RGS10, RGS16, RSAFD1, SAT, SCGB2A1, SLC20A1, SLCO2B1, SPARC, SULF1, TAP1, TCTEL1, TIMP1, TNFSF4, UBD, VSIG4, and ZFYVE26 in the test genetic sample compared to the expression in a control sample classifies the patient as a MMF responder.

In further embodiments, a MMF responder can be identified by the increased expression of any one or more genes in Group III and the decreased expression of any one or more genes in Group I in a sample obtained from a patient with SSc; by the increased expression of any one or more genes in Group III and the increased expression of any one or more genes in Group II in a sample obtained from a patient with SSc; by the decreased expression of any one or more genes in Group I and the increased expression of any one or more genes in Group II in a sample obtained from a patient with SSc; or by the increased expression of any one or more genes in Group III, the decreased expression of any one or more genes in Group I and the increased expression of any one or more genes in Group II in a sample obtained from a patient with SSc.

Changes in gene expression in skin biopsies during treatment appear to occur only in patients who demonstrate clinical improvement, as judged by an improvement in mRSS or by other indicators of organ involvement. Described herein are results of microarray gene expression studies of skin biopsies that support use of molecular signatures in skin as SSc biomarker for clinical response to treatment with MMF. Clinical assessments and skin biopsies were performed on a cohort of SSc patients who were receiving MMF treatment for skin disease before the initiation of therapy and at 6 months and 12 months during (after initiation of) MMF treatment. The study identified a gene expression signature in skin in MMF treatment responders and non-responders at baseline and revealed differences in changes in gene expression that occurred in skin during treatment in responders and non-responders.

The terms “gene expression signature” and “molecular signature,” may be used interchangeably and refer to the expression profile of one or more genes obtained from a skin sample. A “gene” may be a single or double-stranded nucleic acid. A gene is known to one of skill in the art to be a locatable region of genomic sequence, corresponding to a unit of inheritance, which is associated with regulatory regions, transcribed regions, and or other functional sequence regions [Pearson, H., *Nature*, 2006. 441(7092): p. 398-401].

A “responder” is a patient diagnosed with SSc or scleroderma who responds positively to treatment with MMF. A patient experiencing a positive response to treatment with MMF is less symptomatic of SSc or scleroderma as compared to a patient who does not respond positively to treatment with MMF (i.e., a non-responder).

Skin biopsies or samples used herein may be obtained from any location on a patient's body. Preferably, the skin sample is obtained from the arm or back of the patient diagnosed with SSc or scleroderma.

A gene expression signature can be obtained using a variety of known approaches. For example, DNA microarray or gene chip (e.g., AFFYMETRIX®) analyses may be used to obtain a gene expression signature of a patient. Other genetic profiling techniques known to those of skill in the art may also be used, for example, serial analysis of gene expression (SAGE) or other lab-on-a-chip (LOC) technology.

To obtain a gene expression signature, a test sample containing at least one cell from clinically involved (i.e., diseased) tissue is needed (to obtain a sample of nucleic acid, also referred to as a genetic test sample, to be analyzed). Clinically involved tissue can include skin, esophagus, heart, lungs, kidneys, or synovium, but it is not so limited. The test sample

may be obtained using any technique known in the art, including biopsy, blood sample, sample of bodily fluid (e.g., urine, lymph, ascites, sputum, stool, tears, sweat, pus, etc.), surgical excisions needle biopsy, scraping, etc. In particular embodiments, the test sample is clinically involved skin. A genetic sample or protein sample is obtained from the test sample, using known methods. The genetic sample contains a nucleic acid, such as RNA (e.g., mRNA) and/or DNA. For example, in determining gene expression, one can obtain mRNA from the test sample and the mRNA may be reverse transcribed into cDNA for further analysis. In another embodiment, mRNA is used in determining the expression of genes of interest. In some embodiments, the expression level of a particular gene can be determined by determining the level or presence of the protein encoded by the mRNA.

The test sample is preferably a sample representative of the scleroderma tissue as a whole. Multiple samples can be taken from the same tissue in order to obtain a representative sampling of the tissue.

A sample containing genetic material (RNA, DNA) can be obtained from the test sample using any suitable technique known in the art. See, e.g., Ausubel et al. (1999) *Current Protocols in Molecular Biology* (John Wiley & Sons, Inc., New York); *Molecular Cloning: A Laboratory Manual* (1989) 2nd Ed., ed. by Sambrook, Fritsch, and Maniatis (Cold Spring Harbor Laboratory Press); *Nucleic Acid Hybridization* (1984) B. D. Hames & S. J. Higgins eds. The nucleic acid can be purified from whole cells using DNA or RNA purification techniques. The genetic sample can also be amplified using PCR or *in vivo* techniques requiring subcloning. In a particular embodiment, the genetic sample is obtained by isolating mRNA from the cells of the test sample and creating cRNA as described herein.

Genetic samples are typically obtained from an individual (patient) having or suspected of having scleroderma. The individual is a mammal, e.g., a mouse, rat, hamster, rabbit, goat, sheep, cat, dog, pig, horse, cow, non-human primate, or human. In specific embodiments, the individual is a human.

As used herein, a "patient having scleroderma" has at least one recognized clinical manifestation of scleroderma. In one embodiment, a patient having scleroderma has been diagnosed as having scleroderma. Clinical diagnosis of scleroderma is well known in the medical arts. In one embodiment a patient having scleroderma has been diagnosed as having scleroderma on the basis, at least in part, of histological (optionally immunohistological) examination.

As used herein, a “patient suspected of having scleroderma” has at least one clinical sign or symptom that may suggest that the individual has scleroderma. In one embodiment a patient suspected of having scleroderma is suspected to have scleroderma but has not been diagnosed as having scleroderma. In one embodiment a patient suspected of having scleroderma is suspected to have scleroderma, but has not been diagnosed as having scleroderma on the basis, at least in part, of histological (optionally immunohistological) examination.

Raynaud’s phenomenon is the presenting symptom in 75 percent of human subjects with scleroderma. This well-described phenomenon is characterized by episodic digital ischemia, clinically manifested by the sequential development of digital blanching, cyanosis, and rubor (redness) of the fingers or toes following cold exposure and subsequent rewarming. In one embodiment, a patient suspected of having scleroderma has Raynaud’s phenomenon.

Once a test sample (also referred to here as a genetic sample) has been obtained, it can be analyzed for the presence, absence, or level of expression of one or more marker genes, e.g., intrinsic genes as disclosed herein. The analysis can be performed using any techniques known in the art including, but not limited to, sequencing, PCR, RT-PCR, quantitative PCR, hybridization techniques, northern blot analysis, microarray technology, DNA microarray technology, etc. In determining the expression level of a biomarker gene or genes in a genetic sample, the level of expression can be normalized by comparison to the expression of another gene such as a well-known, well-characterized gene or a housekeeping gene.

In particular embodiments, expression of a marker gene of interest is determined using microarray technology. Generally, an array is a solid support with peptide or nucleic acid probes attached to the support. Arrays typically include a plurality of different nucleic acid or peptide probes that are coupled to a surface of a substrate in different, known locations. These arrays, also described as microarrays or colloquially “chips”, have been generally described in the art, (e.g., U.S. Patent Nos. 5,143,854, 5,445,934, 5,744,305, 5,677,195, 6,040,193, 5,424,186 and Fodor, et al. (1991) *Science* 251:767-777). Arrays can be peptides or nucleic acids on beads, gels, polymeric surfaces, fibers such as fiber optics, glass or any other appropriate substrate, see U.S. Patent Nos. 5,770,358, 5,789,162, 5,708,153, 6,040,193 and 5,800,992. Arrays can be packaged in such a manner as to allow for diagnostics or other manipulation of sample in an all inclusive device, see for example, U.S. Patent Nos. 5,856,174 and 5,922,591. The use and analysis of arrays is routinely practiced in the art and any conventional scanner and software can be employed.

The expression data from a particular marker gene or group of marker genes can be analyzed using statistical methods, such as those described herein, to classify or determine the clinical endpoints of scleroderma patients. In this analysis, the expression of one or more marker genes in the patient skin sample is compared to the expression of the one or more marker genes in a control or reference sample. A control or reference sample can be a sample taken from the same patient, such as clinically uninvolved tissue or normal tissue, a sample from a MMF treatment responder, a sample from a MMF treatment nonresponder or a sample from a healthy individual. In addition, a control sample can be expression, such as the average expression of a gene of interest from a cohort of healthy individuals. The control or reference can be a predetermined value, such as values obtained for each gene to be assessed (e.g., each intrinsic gene included in Group III, Group II or Group I or presented elsewhere herein) from a population of patients with SSc or scleroderma who are MMF treatment responders or non-responders.

In one embodiment, a control or reference sample includes a composite of data derived from a plurality of nucleic acid microarray hybridizations representative of the subtype. In this case, the control can serve as a baseline (pretreatment) indicator, useful to identify a patient as a MMF treatment responder or a MMF treatment nonresponder and also as values toward which a non-responder patient must move (perhaps through treatment with other medications) in order to become a MMF treatment responder.

In one embodiment, a control or reference sample includes a composite of data derived from a plurality of nucleic acid microarray hybridizations used to assess gene expression signatures of patients known to respond to MMF treatment, such as microarray hybridizations analyzing MMF treatment responders described herein.

Based on data and principles set forth herein, a subject having or suspected of having scleroderma can be identified as MMF treatment responsive (or likely to respond to MMF treatment) or MMF treatment non-responsive. That a patient or subject is an MMF treatment responder can be confirmed using additional known methods. For example, the patient can be treated with MMF and the effect on mRSS or other indicators of organ involvement assessed. For example, an improvement in mRSS is an indicator of positive response to MMF treatment. In one embodiment, sample classification is performed by Pearson correlations to the average centroid of the genes shown to be up- or down-regulated in each group. Both up- and down-regulated genes can be important. As explained herein, this profile can be measured in skin biopsies of patients with scleroderma using either a gene

expression microarray or, especially for small subsets of genes, by a method such as quantitative PCR.

Example 1 Identification of Gene Expression Signatures in SSc Patients Who are MMF Treatment Responders or Non-Responders

A prospective, open-label, observational study was conducted in a clinically well-characterized cohort of SSc patients who were receiving MMF treatment for progressive skin disease in the opinion of the treating physician. Detailed clinical assessments and skin biopsies were performed before the initiation of therapy and at 6 and 12 months during MMF treatment. The purpose of the study was to identify a gene expression signature in skin in MMF treatment responders (responders) and those who do not respond to MMF treatment (non-responders) at baseline (before MMF treatment) and to analyze the differences in the changes in gene expression that occurred in skin during treatment in responders and non-responders. The hypothesis was that the pattern of gene expression in skin at baseline would differ between MMF responders and non-responders, and that there would be alterations in gene expression during MMF treatment in responders, but not in non-responders. The differences between responders and nonresponders can be used to predict or aid in predicting whether an SSc patient will respond to MMF treatment and to assess the effectiveness of MMF treatment.

Patients seen at the Northwestern Scleroderma Program who met American College of Rheumatology criteria for SSc with a mRSS ≥ 16 and would be receiving mycophenolate mofetil for the indication of progressive skin tightening were assessed. All patients provided written informed consent in accordance with the Institutional Review Board Guidelines of Northwestern University. Patients underwent a standardized physical exam, including mRSS performed by one clinician at study entry (prior to treatment) and at 6 months and 12 months post MMF initiation. A pair of skin biopsies was removed from clinically involved skin (forearm) and clinically uninvolved skin (back) from the non-dominant side of the body. Two biopsies (one from forearm and back) were placed in RNeasy[®] (Applied Biosystems, Ambion[®], Carlsbad, California, U.S.A.) and used for DNA microarray analysis and the other biopsy was placed in 10% neutral buffered formalin and used for histological analyses.

Response to MMF was defined as an improvement in mRSS ≥ 5 , which is the minimal clinically important difference [Amjadi, S., et al., *Arthritis Rheum*, 2009. 60(8): p. 2490-8] or

a $\geq 20\%$ improvement in skin score from baseline (which ever was greater) that published studies suggest is a treatment response rather than the natural history of SSc [Khanna, D., et al., *Arthritis Rheum*, 2007. 56(5): p. 1676-84].

To examine genome-wide changes in gene expression induced by MMF on a cellular level, 200 ng total RNA was amplified and labeled using the Agilent Technologies (Santa Clara, California, U.S.A.) low input fluorescent linear amplification for hybridization as described previously [Milano, A., et al., *PLoS One*, 2008. 3(7): p. e2696]. Briefly, subject RNA was labeled with Cy3 dye, and Universal Human Reference RNA (UHR) (Stratagene) (Agilent Technologies) was labeled with fluorescent Cy5 dye. After amplification and labeling, the cRNA was purified and co-hybridized with UHR RNA to whole human genome microarrays, representing 41,000 unique probes. The hybridization was carried out for 17 hours at 65°C. A total of 89 arrays were hybridized, which included technical replicates.

Arrays were washed and scanned and Gene Pix Pro 5.0 software. Data were Log2 LOWESS normalized for the Cy5/Cy3 ratio, and data was filtered to select array spots with an intensity 2 fold or greater than the local background in either the Cy3 or Cy5 channel. Any probes missing more than 20% of the data across all arrays were omitted from further analysis.

Intrinsic gene analysis was conducted as previously described to identify the genes that are most similar between forearm and back samples for a given individual, but most different between individuals [Milano, A., et al., *PLoS One*, 2008. 3(7): p. e2696]. For the gene expression of each probe, the algorithm calculated the ratio of the variability within each group of arrays to the variability between each group of arrays. The weighted average of the variance of each group of arrays formed the value of the numerator (A). The weighted average of the gene expression for arrays in each group was calculated and the variance of the average gene expression across all groups of arrays formed the denominator (B). The within group variance divided by the between group variance resulted in an "intrinsic score" for each probe. To determine an FDR value, the gene expression data was permuted multiple times, and the intrinsic gene algorithm was used with each of the permuted gene expression datasets. The average number of probes that were less than a given intrinsic score cutoff in the permuted data was divided by the number of probes that obtained the intrinsic score cutoff in the non-permuted data. This value was multiplied by 100 to provide a percentage FDR rate.

To determine if the baseline gene expression in skin was different between MMF

responders and non-responders, and whether MMF responders cluster in the same molecularly defined subset that have been previously described (Diffuse 1, Diffuse 2, Inflammatory, Normal-like and Limited) [Milano, A., et al., *PLoS One*, 2008. 3(7): p. e2696], a gene expression analysis was conducted. This analysis identified genes having expression patterns most similar between arm and back biopsies for each subject having the greatest variance among all samples, which has been termed 'intrinsic gene analysis' [Milano, A., et al., *PLoS One*, 2008. 3(7): p. e2696]. The hypothesis was that MMF responders would be members of the inflammatory molecularly defined subset because MMF inhibits lymphocyte proliferation [Milano, A., et al., *PLoS One*, 2008. 3(7): p. e2696]. Using data obtained from the gene expression study, an unsupervised hierarchical clustering analysis was performed to characterize inherent data-driven groupings (FIG. 1). Included in the experiment were previously analyzed samples from SSc controls (SSc registry), with known molecularly defined signatures. Also included were biopsies from normal healthy controls (Cntrl). The biopsies from the SSc registry and healthy controls were employed to enable identification of the molecularly defined clusters. Findings revealed that expression signatures from pre-treatment (arm and back) biopsies amongst MMF responders (R) and non-responders (NR) were distinctly separate. Further, MMF treatment responders clustered within the inflammatory molecularly defined subset apart from the MMF-non-responders [Milano, A., et al., *PLoS One*, 2008. 3(7): p. e2696] (FIG. 1).

To identify an MMF responsive gene expression signature in skin at baseline, MMF-responders' baseline gene expression patterns was compared to 6 or 12 month post-MMF treatment levels. Genes having expression that changed concordantly between pre- and post-treatment in arm and back samples were analyzed further. In arm or back samples, 572 genes that had a $p < 0.002$ (FDR 10%) were identified (Table 1). See also Table 1A. There were dramatic differences in gene expression in arm samples between responders and non-responders at baseline as demonstrated by SAM and cluster analysis (FIG. 2A). The difference in back samples was not as clear, suggesting that skin biopsies from the forearm may be more useful in predicting response to MMF in patients with SSc (FIG. 2B).

To confirm the physical exam finding of softened skin in MMF-responders, the morphology of skin biopsy specimens was examined using routine H&E staining of paraffin embedded sections. There are clear differences in the extent of fibrosis between pre- and post-treatment biopsies in responders. The MMF-nonresponder demonstrated a greater degree in skin fibrosis and a further loss of the normal dermal appendages.

TABLE 1

Entrez ID	Gene Symbol	Gene Name	Accession
21	ABCA3	ATP-binding cassette, sub-family A (ABC1), member 3	NM_001089
25	ABL1	c-abl oncogene 1, non-receptor tyrosine kinase	NM_005157
47	ACLY	ATP citrate lyase	NM_001096
115	ADCY9	adenylate cyclase 9	NM_001116
118	ADD1	adducin 1 (alpha)	NM_001119
132	ADK	adenosine kinase	NM_001123
164	APIG1	adaptor-related protein complex 1, gamma 1 subunit	NM_001030007
185	AGTR1	angiotensin II receptor, type 1	NM_000685
351	APP	amyloid beta (A4) precursor protein	NM_000484
367	AR	androgen receptor	NM_000044
375	ARF1	ADP-ribosylation factor 1	NM_001024226
488	ATP2A2	ATPase, Ca++ transporting, cardiac muscle, slow twitch 2	NM_001135765
534	ATP6V1G2	ATPase, H+ transporting, lysosomal 13kDa, V1 subunit G2	NM_001204078
710	SERPING1	serpin peptidase inhibitor, clade G (C1 inhibitor), member 1	NM_000062
975	CD81	CD81 molecule	NM_004356
983	CDK1	cyclin-dependent kinase 1	NM_001170406
1022	CDK7	cyclin-dependent kinase 7	NM_001799
1033	CDKN3	cyclin-dependent kinase inhibitor 3	NM_001130851
1039	CDR2	cerebellar degeneration-related protein 2, 62kDa	NM_001802
1063	CENPF	centromere protein F, 350/400kDa (mitosin)	NM_016343
1277	COL1A1	collagen, type I, alpha 1	NM_000088
1305	COL13A1	collagen, type XIII, alpha 1 collagen, type XIII, alpha 1	NM_001130103
1349	COX7B	cytochrome c oxidase subunit VIIb	NM_001866
1387	CREBBP	CREB binding protein	NM_001079846
1452	CSNK1A1	casein kinase 1, alpha 1 casein kinase 1, alpha 1	NM_001025105
1593	CYP27A1	cytochrome P450, family 27, subfamily A, polypeptide 1	NM_000784
1627	DBN1	drebrin 1	NM_004395
1727	CYB5R3	cytochrome b5 reductase 3	NM_000398
1876	E2F6	E2F transcription factor 6	NM_198256
1933	EEF1B2	eukaryotic translation elongation factor 1 beta 2	NM_001037663
1964	EIF1AX	eukaryotic translation initiation factor 1A, X-linked	NM_001412

Entrez ID	Gene Symbol	Gene Name	Accession
2026	ENO2	enolase 2 (gamma, neuronal)	NM_001975
2030	SLC29A1	solute carrier family 29 (nucleoside transporters), member 1	NM_001078174
2057	EPOR	erythropoietin receptor	NM_000121
2108	ETFA	electron-transfer-flavoprotein, alpha polypeptide	NM_000126
2140	EYA3	Eyes absent homolog 3 (Drosophila)	NM_001990
2149	F2R	coagulation factor II (thrombin) receptor	NM_001992
2155	F7	coagulation factor VII (serum prothrombin conversion accelerator)	NM_000131
2159	F10	coagulation factor X	NM_000504
2186	BPTF	bromodomain PHD finger transcription factor	NM_004459
2192	FBLN1	fibulin 1	NM_001996
2199	FBLN2	fibulin 2	NM_001004019
2350	FOLR2	folate receptor 2 (fetal)	NM_000803
2662	GDF10	growth differentiation factor 10	NM_004962
2720	GLB1	galactosidase, beta 1	NM_000404
2743	GLRB	glycine receptor, beta	NM_000824
2781	GNAZ	guanine nucleotide binding protein (G protein), alpha z polypeptide	NM_002073
2821	GPI	glucose-6-phosphate isomerase	NM_000175
2950	GSTP1	glutathione S-transferase pi 1	NM_000852
2963	GTF2F2	general transcription factor IIF, polypeptide 2, 30kDa	NM_004128
2969	GTF2I	general transcription factor Iii	NM_001163636
2990	GUSB	glucuronidase, beta	NM_000181
3015	H2AFZ	H2A histone family, member Z H2A histone family, member Z H2A histone family, member Z	NM_002106
3069	HDLBP	High density lipoprotein binding protein	NM_005336
3094	HINT1	histidine triad nucleotide binding protein 1 histidine triad nucleotide binding protein 1	NM_005340
3148	HMGB2	High-mobility group box 2	NM_001130688
3399	ID3	inhibitor of DNA binding 3, dominant negative helix-loop-helix protein	NM_002167
3454	IFNAR1	interferon (alpha, beta and omega) receptor 1	NM_000629
3482	IGF2R	insulin-like growth factor 2 receptor	NM_000876
3667	IRS1	insulin receptor substrate 1	NM_005544
3671	ISLR	immunoglobulin superfamily containing leucine-rich repeat	NM_005545
3680	ITGA9	integrin, alpha 9	NM_002207
3693	ITGB5	integrin, beta 5	NM_002213

Entrez ID	Gene Symbol	Gene Name	Accession
3913	LAMB2	laminin, beta 2 (laminin S)	NM_002292
3916	LAMP1	lysosomal-associated membrane protein 1	NM_005561
3931	LCAT	lecithin-cholesterol acyltransferase	NM_000229
3984	LIMK1	LIM domain kinase 1	NM_002314
4043	LRPAP1	low density lipoprotein receptor-related protein associated protein 1	NM_002337
4054	LTBP3	latent transforming growth factor beta binding protein 3	NM_001130144
4066	LYL1	lymphoblastic leukemia derived sequence 1	NM_005583
4085	MAD2L1	MAD2 mitotic arrest deficient-like 1 (yeast)	NM_002358
4111	MAGEA12	melanoma antigen family A, 12	NM_001166386
4116	MAGOH	mago-nashi homolog, proliferation-associated (Drosophila)	NM_002370
4194	MDM4	Mdm4 p53 binding protein homolog (mouse)	NM_002393
4245	MGAT1	mannosyl (alpha-1,3-)-glycoprotein beta-1,2-N-acetylglucosaminyltransferase	NM_001114617
4324	MMP15	matrix metalloproteinase 15 (membrane-inserted)	NM_002428
4515	MTCP1	mature T-cell proliferation 1	NM_001018025
4528	MTIF2	mitochondrial translational initiation factor 2	NM_001005369
4628	MYH10	myosin, heavy chain 10, non-muscle	NM_005964
4692	NDN	necdin homolog (mouse)	NM_002487
4712	NDUFB6	NADH dehydrogenase (ubiquinone) 1 beta subcomplex, 6, 17kDa	NM_001199987
4729	NDUFV2	NADH dehydrogenase (ubiquinone) flavoprotein 2, 24kDa	NM_021074
4733	DRG1	developmentally regulated GTP binding protein 1	NM_004147
4758	NEU1	sialidase 1 (lysosomal sialidase)	NM_000434
4771	NF2	neurofibromin 2 (merlin)	NM_000268
4779	NFE2L1	nuclear factor (erythroid-derived 2)-like 1	NM_003204
4836	NMT1	N-myristoyltransferase 1	NM_021079
4853	NOTCH2	notch 2	NM_001200001
4856	NOV	nephroblastoma overexpressed gene nephroblastoma overexpressed gene	NM_002514
4869	NPM1	nucleophosmin (nucleolar phosphoprotein B23, numatrin)	NM_001037738
4947	OAZ2	ornithine decarboxylase antizyme 2	NM_002537
4952	OCRL	oculocerebrorenal syndrome of Lowe	NM_000276
4976	OPA1	optic atrophy 1 (autosomal dominant)	NM_015560

Entrez ID	Gene Symbol	Gene Name	Accession
5104	SERPINA5	serpin peptidase inhibitor, clade A (alpha-1 antiproteinase, antitrypsin), member 5	NM_000624
5111	PCNA	proliferating cell nuclear antigen	NM_002592
5159	PDGFRB	platelet-derived growth factor receptor, beta polypeptide	NM_002609
5163	PDK1	pyruvate dehydrogenase kinase, isozyme 1	NM_002610
5253	PHF2	PHD finger protein 2	NM_005392
5351	PLOD1	procollagen-lysine 1, 2-oxoglutarate 5-dioxygenase 1	NM_000302
5393	EXOSC9	exosome component 9	NM_001034194
5420	PODXL	podocalyxin-like	NM_001018111
5514	PPP1R10	protein phosphatase 1, regulatory (inhibitor) subunit 10	NM_002714
5557	PRIM1	primase, DNA, polypeptide 1 (49kDa)	NM_000946
5565	PRKAB2	protein kinase, AMP-activated, beta 2 non-catalytic subunit	NM_005399
5648	MASPI	mannan-binding lectin serine peptidase 1 (C4/C2 activating component of Ra-reactive factor)	NM_001031849
5664	PSEN2	presenilin 2 (Alzheimer disease 4)	NM_000447
5681	PSKH1	protein serine kinase H1	NM_006742
5684	PSMA3	proteasome (prosome, macropain) subunit, alpha type, 3	NM_002788
5757	PTMA	prothymosin, alpha prothymosin, alpha	NM_001099285
5771	PTPN2	protein tyrosine phosphatase, non-receptor type 2	NM_002828
5828	PEX2	peroxisomal biogenesis factor 2	NM_000318
5868	RAB5A	RAB5A, member RAS oncogene family	NM_004162
5884	RAD17	RAD17 homolog (S. pombe)	NM_002873
5914	RARA	retinoic acid receptor, alpha	NM_000964
5976	UPF1	UPF1 regulator of nonsense transcripts homolog (yeast)	NM_002911
6046	BRD2	bromodomain containing 2	NM_001113182
6050	RNH1	ribonuclease/angiogenin inhibitor 1	NM_002939
6144	RPL21	ribosomal protein L21	NM_000982
6280	S100A9	S100 calcium binding protein A9	NM_002965
6297	SALL2	sal-like 2 (Drosophila)	NM_005407
6330	SCN4B	sodium channel, voltage-gated, type IV, beta	NM_001142348
6347	CCL2	chemokine (C-C motif) ligand 2	NM_002982
6387	CXCL12	chemokine (C-X-C motif) ligand 12	NM_000609
6389	SDHA	succinate dehydrogenase complex, subunit A, flavoprotein (Fp)	NM_004168
6430	SRSF5	serine/arginine-rich splicing factor 5	NM_001039465

Entrez ID	Gene Symbol	Gene Name	Accession
6433	SFSWAP	splicing factor, suppressor of white-apricot homolog (Drosophila)	NM_004592
6483	ST3GAL2	ST3 beta-galactoside alpha-2,3-sialyltransferase 2	NM_006927
6586	SLIT3	slit homolog 3 (Drosophila)	NM_003062
6617	SNAPC1	small nuclear RNA activating complex, polypeptide 1, 43kDa	NM_003082
6632	SNRPD1	small nuclear ribonucleoprotein D1 polypeptide 16kDa	NM_006938
6636	SNRPF	small nuclear ribonucleoprotein polypeptide F	NM_003095
6648	SOD2	superoxide dismutase 2, mitochondrial	NM_000636
6659	SOX4	SRY (sex determining region Y)-box 4	NM_003107
6728	SRP19	signal recognition particle 19kDa	NM_003135
6734	SRPR	signal recognition particle receptor (docking protein)	NM_001177842
6744	SSFA2	sperm specific antigen 2	NM_001130445
6815	STYX	serine/threonine/tyrosine interacting protein	NM_001130701
6821	SUOX	sulfite oxidase	NM_000456
6836	SURF4	surfeit 4	NM_033161
6885	MAP3K7	mitogen-activated protein kinase kinase kinase 7	NM_003188
6886	TAL1	T-cell acute lymphocytic leukemia 1	NM_003189
6917	TCEA1	transcription elongation factor A (SII), 1	NM_006756
6929	TCF3	transcription factor 3 (E2A immunoglobulin enhancer binding factors E12/E47)	NM_001136139
6942	TCF20	transcription factor 20 (AR1)	NM_005650
7024	TFCP2	transcription factor CP2	NM_001173452
7031	TFF1	trefoil factor 1	NM_003225
7067	THRA	thyroid hormone receptor, alpha (erythroblastic leukemia viral (v-erb-a) oncogene homolog, avian)	NM_001190918
7148	TNXB	tenascin XB	NM_019105
7153	TOP2A	topoisomerase (DNA) II alpha 170kDa	NM_001067
7187	TRAF3	TNF receptor-associated factor 3	NM_001199427
7204	TRIO	triple functional domain (PTPRF interacting)	NM_007118
7272	TTK	TTK protein kinase	NM_001166691
7327	UBE2G2	ubiquitin-conjugating enzyme E2G 2 (UBC7 homolog, yeast)	NM_001202489
7357	UGCG	UDP-glucose ceramide glucosyltransferase	NM_003358
7373	COL14A1	collagen, type XIV, alpha 1	NM_021110
7596	ZNF45	zinc finger protein 45	NM_003425

Entrez ID	Gene Symbol	Gene Name	Accession
7625	ZNF74	zinc finger protein 74	NM_003426
7633	ZNF79	zinc finger protein 79	NM_007135
7743	ZNF189	zinc finger protein 189	NM_003452
7753	ZNF202	zinc finger protein 202	NM_003455
7775	ZNF232	zinc finger protein 232	NM_014519
7798	LUZP1	leucine zipper protein 1	NM_001142546
7841	MOGS	mannosyl-oligosaccharide glucosidase mannosyl-oligosaccharide glucosidase	NM_001146158
7869	SEMA3B	sema domain, immunoglobulin domain (Ig), short basic domain, secreted, (semaphorin) 3B sema domain, immunoglobulin domain (Ig), short basic domain, secreted, (semaphorin) 3B	NM_001005914
8085	MLL2	myeloid/lymphoid or mixed-lineage leukemia 2	NM_003482
8106	PABPN1	Poly(A) binding protein, nuclear 1	NM_004643
8325	FZD8	frizzled homolog 8 (Drosophila)	NM_031866
8350	HIST1H3A	histone cluster 1, H3a	NM_003529
8353	HIST1H3E	histone cluster 1, H3e	NM_003532
8357	HIST1H3H	histone cluster 1, H3h	NM_003536
8409	UXT	ubiquitously-expressed transcript	NM_004182
8425	LTBP4	latent transforming growth factor beta binding protein 4	NM_001042544
8554	PIAS1	protein inhibitor of activated STAT, 1	NM_016166
8559	PRPF18	PRP18 pre-mRNA processing factor 18 homolog (S. cerevisiae)	NM_003675
8574	AKR7A2	aldo-keto reductase family 7, member A2 (aflatoxin aldehyde reductase)	NM_003689
8663	EIF3C	eukaryotic translation initiation factor 3, subunit C	NM_001037808
8664	EIF3D	eukaryotic translation initiation factor 3, subunit D	NM_003753
8678	BECN1	beclin 1, autophagy related	NM_003766
8722	CTSF	cathepsin F	NM_003793
8760	CDS2	CDP-diacylglycerol synthase (phosphatidate cytidyltransferase) 2	NM_003818
8767	RIPK2	receptor-interacting serine-threonine kinase 2	NM_003821
8780	RIOK3	RIO kinase 3 (yeast)	NM_003831
8848	TSC22D1	TSC22 domain family, member 1	NM_006022
8974	P4HA2	prolyl 4-hydroxylase, alpha polypeptide II	NM_001017973
8991	SELENBP1	selenium binding protein 1	NM_003944
9131	AIFM1	apoptosis-inducing factor, mitochondrion-associated, 1	NM_001130846
9139	CBFA2T2	core-binding factor, runt domain, alpha	NM_001032999

Entrez ID	Gene Symbol	Gene Name	Accession
		subunit 2; translocated to, 2	
9141	PDCD5	programmed cell death 5	NM_004708
9188	DDX21	DEAD (Asp-Glu-Ala-Asp) box polypeptide 21	NM_004728
9262	STK17B	serine/threonine kinase 17b	NM_004226
9320	TRIP12	thyroid hormone receptor interactor 12	NM_004238
9326	ZNHIT3	zinc finger, HIT-type containing 3	NM_004773
9440	MED17	mediator complex subunit 17	NM_004268
9476	NAPSA	napsin A aspartic peptidase	NM_004851
9493	KIF23	kinesin family member 23	NM_004856
9541	CIR1	corepressor interacting with RBPJ, 1	NM_004882
9551	ATP5J2	ATP synthase, H ⁺ transporting, mitochondrial Fo complex, subunit F2	NM_001003713
9570	GOSR2	golgi SNAP receptor complex member 2	NM_001012511
9590	AKAP12	A kinase (PRKA) anchor protein 12	NM_005100
9701	PPP6R2	protein phosphatase 6, regulatory subunit 2	NM_014678
9751	SNPH	syntaphilin	NM_014723
9768	KIAA0101	KIAA0101	NM_001029989
9794	MAML1	mastermind-like 1 (Drosophila)	NM_014757
9798	KIAA0174	KIAA0174	NM_014761
9805	SCRN1	secernin 1	NM_001145513
9815	GIT2	G protein-coupled receptor kinase interacting ArfGAP 2	NM_001135213
9843	HEPH	hephaestin	NM_001130860
9895	TECPR2	tectonin beta-propeller repeat containing 2	NM_001172631
9915	ARNT2	aryl-hydrocarbon receptor nuclear translocator 2	NM_014862
9962	SLC23A2	solute carrier family 23 (nucleobase transporters), member 2	NM_005116
9978	RBX1	ring-box 1, E3 ubiquitin protein ligase	NM_014248
9991	ROD1	ROD1 regulator of differentiation 1 (S. pombe) ROD1 regulator of differentiation 1 (S. pombe)	NM_001163788
10018	BCL2L11	BCL2-like 11 (apoptosis facilitator)	NM_001204106
10040	TOM1L1	target of myb1 (chicken)-like 1	NM_005486
10049	DNAJB6	DnaJ (Hsp40) homolog, subfamily B, member 6 DnaJ (Hsp40) homolog, subfamily B, member 6 DnaJ (Hsp40) homolog, subfamily B, member 6	NM_005494
10106	CTDSP2	CTD (carboxy-terminal domain, RNA polymerase II, polypeptide A) small phosphatase 2	NM_005730
10127	ZNF263	zinc finger protein 263	NM_005741
10135	NAMPT	nicotinamide	NM_005746

Entrez ID	Gene Symbol	Gene Name	Accession
		phosphoribosyltransferase nicotinamide phosphoribosyltransferase nicotinamide phosphoribosyltransferase	
10161	LPAR6	lysophosphatidic acid receptor 6	NM_001162497
10168	ZNF197	zinc finger protein 197	NM_001024855
10200	MPHOSPH6	M-phase phosphoprotein 6	NM_005792
10209	EIF1	eukaryotic translation initiation factor 1 eukaryotic translation initiation factor 1	NM_005801
10231	RCAN2	regulator of calcineurin 2	NM_005822
10391	CORO2B	coronin, actin binding protein, 2B	NM_001190456
10403	NDC80	NDC80 homolog, kinetochore complex component (<i>S. cerevisiae</i>)	NM_006101
10417	SPON2	spondin 2, extracellular matrix protein	NM_001128325
10421	CD2BP2	CD2 (cytoplasmic tail) binding protein 2	NM_006110
10438	C1D	C1D nuclear receptor corepressor C1D nuclear receptor corepressor	NM_001190263
10481	HOXB13	homeobox B13	NM_006361
10493	VAT1	vesicle amine transport protein 1 homolog (<i>T. californica</i>)	NM_006373
10541	ANP32B	acidic (leucine-rich) nuclear phosphoprotein 32 family, member B	NM_006401
10606	PAICS	phosphoribosylaminoimidazole carboxylase, phosphoribosylaminoimidazole succinocarboxamide synthetase	NM_001079524
10609	LEPREL4	leprecan-like 4	NM_006455
10614	HEXIM1	hexamethylene bis-acetamide inducible 1	NM_006460
10618	TGOLN2	Trans-golgi network protein 2	NM_006464
10670	RRAGA	Ras-related GTP binding A	NM_006570
10671	DCTN6	dynactin 6	NM_006571
10742	RAI2	retinoic acid induced 2	NM_001172732
10746	MAP3K2	mitogen-activated protein kinase kinase kinase 2	NM_006609
10766	TOB2	transducer of ERBB2, 2	NM_016272
10775	POP4	processing of precursor 4, ribonuclease P/MRP subunit (<i>S. cerevisiae</i>)	NM_006627
10910	SUGT1	SGT1, suppressor of G2 allele of SKP1 (<i>S. cerevisiae</i>)	NM_001130912
10916	MAGED2	melanoma antigen family D, 2	NM_014599
10919	EHMT2	euchromatic histone-lysine N- methyltransferase 2 euchromatic histone-lysine N-methyltransferase 2	NM_006709
10923	SUB1	SUB1 homolog (<i>S. cerevisiae</i>)	NM_006713

Entrez ID	Gene Symbol	Gene Name	Accession
10940	POP1	processing of precursor 1, ribonuclease P/MRP subunit (<i>S. cerevisiae</i>)	NM_001145860
11011	TLK2	tousled-like kinase 2	NM_001112707
11162	NUDT6	nudix (nucleoside diphosphate linked moiety X)-type motif 6	NM_007083
11177	BAZ1A	bromodomain adjacent to zinc finger domain, 1A	NM_013448
11193	WBP4	WW domain binding protein 4 (formin binding protein 21)	NM_007187
11328	FKBP9	FK506 binding protein 9, 63 kDa	NM_007270
22822	PHLDA1	pleckstrin homology-like domain, family A, member 1	NM_007350
22880	MORC2	MORC family CW-type zinc finger 2	NM_014941
22882	ZHX2	MORC family CW-type zinc finger 2	NM_014943
22927	HABP4	zinc fingers and homeoboxes 2	NM_014282
22931	RAB18	hyaluronan binding protein 4	NM_021252
22950	SLC4A1AP	RAB18, member RAS oncogene family	NM_018158
22954	TRIM32	solute carrier family 4 (anion exchanger), member 1, adaptor protein tripartite motif containing 32	NM_001099679
23002	DAAM1	tripartite motif containing 32	NM_014992
23077	MYCBP2	dishevelled associated activator of morphogenesis 1	NM_015057
23160	WDR43	MYC binding protein 2	NM_015131
23176	8-Sep	WD repeat domain 43	NM_001098811
23192	ATG4B	septin 8	NM_013325
23216	TBC1D1	ATG4 autophagy related 4 homolog B (<i>S. cerevisiae</i>)	NM_015173
23229	ARHGEF9	TBC1 (tre-2/USP6, BUB2, cdc16) domain family, member 1	NM_001173479
23245	ASTN2	Cdc42 guanine nucleotide exchange factor (GEF) 9	NM_001184734
23253	ANKRD12	astrotactin 2	NM_001083625
23417	MLYCD	ankyrin repeat domain 12	NM_012213
23428	SLC7A8	malonyl-CoA decarboxylase malonyl-CoA decarboxylase	NM_012244
23462	HEY1	solute carrier family 7 (amino acid transporter, L-type), member 8	NM_001040708
23466	CBX6	hairy/enhancer-of-split related with YRPW motif 1	NM_014292
23468	CBX5	chromobox homolog 6	NM_001127321
23500	DAAM2	chromobox homolog 5	NM_001201427
23598	PATZ1	dishevelled associated activator of morphogenesis 2	NM_014323
		POZ (BTB) and AT hook containing	

Entrez ID	Gene Symbol	Gene Name	Accession
		zinc finger 1	
23636	NUP62	nucleoporin 62kDa	NM_001193357
25758	C11orf41	chromosome 11 open reading frame 41	NM_012194
25849	PARM1	prostate androgen-regulated mucin-like protein 1	NM_015393
25888	ZNF473	zinc finger protein 473	NM_001006656
25903	OLFML2B	olfactomedin-like 2B	NM_015441
25917	THUMP3	THUMP domain containing 3	NM_001114092
25960	GPR124	G protein-coupled receptor 124	NM_032777
25977	NECAP1	NECAP endocytosis associated 1	NM_015509
25978	CHMP2B	chromatin modifying protein 2B	NM_014043
26137	ZBTB20	zinc finger and BTB domain containing 20	NM_001164342
26275	HIBCH	3-hydroxyisobutyryl-CoA hydrolase	NM_014362
26289	AK5	adenylate kinase 5	NM_012093
26508	HEYL	hairy/enhancer-of-split related with YRPW motif-like	NM_014571
26608	TBL2	transducin (beta)-like 2	NM_012453
27042	C1orf107	chromosome 1 open reading frame 107	NM_014388
27109	ATP5S	ATP synthase, H ⁺ transporting, mitochondrial Fo complex, subunit s (factor B) ATP synthase, H ⁺ transporting, mitochondrial Fo complex, subunit s (factor B)	NM_001003803
27122	DKK3	dickkopf homolog 3 (Xenopus laevis) dickkopf homolog 3 (Xenopus laevis) dickkopf homolog 3 (Xenopus laevis)	NM_001018057
27249	MMADHC	methylmalonic aciduria (cobalamin deficiency) cblD type, with homocystinuria	NM_015702
27258	LSM3	LSM3 homolog, U6 small nuclear RNA associated (S. cerevisiae)	NM_014463
28955	DEXI	Dexi homolog (mouse) Dexi homolog (mouse)	NM_014015
29015	SLC43A3	solute carrier family 43, member 3	NM_014096
29035	C16orf72	chromosome 16 open reading frame 72	NM_014117
29080	CCDC59	coiled-coil domain containing 59	NM_014167
29088	MRPL15	mitochondrial ribosomal protein L15	NM_014175
29103	DNAJC15	DnaJ (Hsp40) homolog, subfamily C, member 15	NM_013238
29920	PYCR2	pyrroline-5-carboxylate reductase family, member 2	NM_013328
30850	CDR2L	cerebellar degeneration-related protein 2-like	NM_014603
50801	KCNK4	potassium channel, subfamily K, member 4	NM_033310
50861	STMN3	stathmin-like 3	NM_015894

Entrez ID	Gene Symbol	Gene Name	Accession
50865	HEBP1	heme binding protein 1	NM_015987
51000	SLC35B3	solute carrier family 35, member B3	NM_001142540
51003	MED31	mediator complex subunit 31	NM_016060
51063	CALHM2	calcium homeostasis modulator 2	NM_015916
51115	FAM82B	family with sequence similarity 82, member B family with sequence similarity 82, member B	NM_016033
51118	UTP11L	UTP11-like, U3 small nucleolar ribonucleoprotein, (yeast)	NM_016037
51150	SDF4	stromal cell derived factor 4	NM_016176
51167	CYB5R4	cytochrome b5 reductase 4	NM_016230
51182	HSPA14	Heat shock 70kDa protein 14	NM_016299
51185	CRBN	cereblon	NM_001173482
51199	NIN	ninein (GSK3B interacting protein)	NM_016350
51246	SHISA5	Shisa homolog 5 (Xenopus laevis)	NM_016479
51251	NT5C3	5'-nucleotidase, cytosolic III	NM_001002010
51263	MRPL30	mitochondrial ribosomal protein L30	NM_145212
51292	GMPR2	guanosine monophosphate reductase 2	NM_001002000
51535	PPHLN1	periphilin 1	NM_001143787
51540	SCLY	selenocysteine lyase	NM_016510
51604	PIGT	phosphatidylinositol glycan anchor biosynthesis, class T phosphatidylinositol glycan anchor biosynthesis, class T	NM_001184728
51619	UBE2D4	ubiquitin-conjugating enzyme E2D 4 (putative)	NM_015983
51754	TMEM8B	transmembrane protein 8B transmembrane protein 8B	NM_001042589
53342	IL17D	interleukin 17D	NM_138284
53947	A4GALT	alpha 1,4-galactosyltransferase	NM_017436
54149	C21orf91	chromosome 21 open reading frame 91	NM_001100420
54206	ERRFI1	ERBB receptor feedback inhibitor 1	NM_018948
54468	MIOS	missing oocyte, meiosis regulator, homolog (Drosophila)	NM_019005
54503	ZDHHC13	zinc finger, DHHC-type containing 13	NM_001001483
54662	TBC1D13	TBC1 domain family, member 13	NM_018201
54681	P4HTM	prolyl 4-hydroxylase, transmembrane (endoplasmic reticulum) prolyl 4-hydroxylase, transmembrane (endoplasmic reticulum)	NM_177938
54834	GDAP2	ganglioside induced differentiation associated protein 2	NM_001135589
54980	C2orf42	chromosome 2 open reading frame 42	NM_017880
54985	HCFC1R1	host cell factor C1 regulator 1 (XPO1 dependent)	NM_001002017
55055	ZWILCH	Zwilch, kinetochore associated, homolog (Drosophila)	NM_017975

Entrez ID	Gene Symbol	Gene Name	Accession
55069	C7orf42	chromosome 7 open reading frame 42	NM_017994
55070	DET1	de-etiolated homolog 1 (Arabidopsis)	NM_001144074
55071	C9orf40	chromosome 9 open reading frame 40	NM_017998
55100	WDR70	WD repeat domain 70	NM_018034
55142	HAUS2	HAUS augmin-like complex, subunit 2	NM_001130447
55204	GOLPH3L	golgi phosphoprotein 3-like	NM_018178
55215	FANCI	Fanconi anemia, complementation group I	NM_001113378
55239	OGFOD1	2-oxoglutarate and iron-dependent oxygenase domain containing 1	NM_018233
55246	CCDC25	coiled-coil domain containing 25	NM_018246
55652	SLC48A1	solute carrier family 48 (heme transporter), member 1 solute carrier family 48 (heme transporter), member 1	NM_017842
55698	RADIL	Ras association and DIL domains	NM_018059
55742	PARVA	parvin, alpha	NM_018222
55751	TMEM184C	transmembrane protein 184C	NM_018241
55818	KDM3A	lysine (K)-specific demethylase 3A lysine (K)-specific demethylase 3A lysine (K)-specific demethylase 3A	NM_001146688
55839	CENPN	centromere protein N	NM_001100624
55846	ITFG2	integrin alpha FG-GAP repeat containing 2	NM_018463
55872	PBK	PDZ binding kinase	NM_018492
55892	MYNN	myoneurin	NM_001185118
56052	ALG1	asparagine-linked glycosylation 1, beta-1,4-mannosyltransferase homolog (S. cerevisiae)	NM_019109
56257	MEPCE	methylphosphate capping enzyme	NM_001194990
56658	TRIM39	tripartite motif containing 39	NM_021253
56683	C21orf59	chromosome 21 open reading frame 59	NM_021254
56731	SLC2A4RG	SLC2A4 regulator	NM_020062
56925	LXN	latexin	NM_020169
56938	ARNTL2	aryl hydrocarbon receptor nuclear translocator-like 2	NM_020183
56963	RGMA	RGM domain family, member A	NM_001166283
56974	DKFZp547K054	hypothetical protein DKFZp547K054	AL390175.1
56981	PRDM11	PR domain containing 11	NM_020229
56992	KIF15	kinesin family member 15	NM_020242
57082	CASC5	cancer susceptibility candidate 5	NM_144508
57128	LYRM4	LYR motif containing 4	NM_001164840
57134	MAN1C1	mannosidase, alpha, class 1C, member 1	NM_020379
57178	ZMIZ1	zinc finger, MIZ-type containing 1	NM_020338
57212	KIAA0495	KIAA0495	NR_033708.1
57226	LYRM2	LYR motif containing 2 LYR motif	NM_020466

Entrez ID	Gene Symbol	Gene Name	Accession
		containing 2	
57405	SPC25	SPC25, NDC80 kinetochore complex component, homolog (<i>S. cerevisiae</i>)	NM_020675
57446	NDRG3	NDRG family member 3	NM_022477
57456	KIAA1143	KIAA1143	NM_020696
57617	VPS18	vacuolar protein sorting 18 homolog (<i>S. cerevisiae</i>)	NM_020857
57664	PLEKHA4	pleckstrin homology domain containing, family A (phosphoinositide binding specific) member 4	NM_001161354
57692	MAGEE1	melanoma antigen family E, 1	NM_020932
57701	NCKAP5L	NCK-associated protein 5-like	NM_001037806
58190	CTDSP1	CTD (carboxy-terminal domain, RNA polymerase II, polypeptide A) small phosphatase 1	NM_021198
58476	TP53INP2	tumor protein p53 inducible nuclear protein 2	NM_021202
58491	ZNF71	zinc finger protein 71	NM_021216
59345	GNB4	guanine nucleotide binding protein (G protein), beta polypeptide 4	NM_021629
60386	SLC25A19	solute carrier family 25 (mitochondrial thiamine pyrophosphate carrier), member 19	NM_001126121
60492	CCDC90B	coiled-coil domain containing 90B	NM_021825
60626	RIC8A	resistance to inhibitors of cholinesterase 8 homolog A (<i>C. elegans</i>)	NM_021932
63894	VIPAR	VPS33B interacting protein, apical-basolateral polarity regulator	NM_001193314
64219	PJA1	Praja ring finger 1	NM_001032396
64326	RFWD2	ring finger and WD repeat domain 2	NM_001001740
64766	S100PBP	S100P binding protein	NM_001017406
65265	C8orf33	chromosome 8 open reading frame 33	NM_023080
79041	TMEM38A	transmembrane protein 38A	NM_024074
79072	FASTKD3	FAST kinase domains 3	NM_024091
79083	MLPH	melanophilin melanophilin	NM_001042467
79084	WDR77	WD repeat domain 77	NM_024102
79178	THTPA	thiamine triphosphatase	NM_001126339
79447	C16orf53	chromosome 16 open reading frame 53	NM_024516
79600	TCTN1	tectonic family member 1	NM_001082537
79634	SCRN3	secernin 3	NM_001193528
79717	PPCS	phosphopantothenoylecysteine synthetase	NM_001077447
79723	SUV39H2	suppressor of variegation 3-9 homolog 2 (<i>Drosophila</i>)	NM_001193424
79768	C15orf29	chromosome 15 open reading frame 29	NM_024713
79812	MMRN2	multimerin 2	NM_024756

Entrez ID	Gene Symbol	Gene Name	Accession
79825	CCDC48	coiled-coil domain containing 48	NM_024768
79842	ZBTB3	zinc finger and BTB domain containing 3	NM_024784
79877	DCAKD	dephospho-CoA kinase domain containing	NM_001128631
79992	NCRNA00241	non-protein coding RNA 241	AK026765.1
80079	FLJ13769	hypothetical protein FLJ13769	XR_040824.1
80258	EFHC2	EF-hand domain (C-terminal) containing 2	NM_025184
80303	EFHD1	EF-hand domain family, member D1	NM_025202
80745	THUMPD2	THUMP domain containing 2	NM_025264
80760	ITIH5	Inter-alpha (globulin) inhibitor H5	NM_001001851
80818	ZNF436	zinc finger protein 436	NM_001077195
80824	DUSP16	Dual specificity phosphatase 16	NM_030640
81562	LMAN2L	lectin, mannose-binding 2-like	NM_001142292
81614	NIPA2	non imprinted in Prader-Willi/Angelman syndrome 2	NM_001008860
81618	ITM2C	integral membrane protein 2C	NM_001012514
81689	ISCA1	iron-sulfur cluster assembly 1 homolog (S. cerevisiae)	NM_030940
81892	C14orf156	chromosome 14 open reading frame 156	NM_031210
81930	KIF18A	kinesin family member 18A	NM_031217
83716	CRISPLD2	cysteine-rich secretory protein LCCL domain containing 2	NM_031476
83742	MARVELD1	MARVEL domain containing 1	NM_031484
83759	RBM4B	RNA binding motif protein 4B	NM_031492
83858	ATAD3B	ATPase family, AAA domain containing 3B	NM_031921
83931	STK40	serine/threonine kinase 40	NM_032017
83932	C1orf124	chromosome 1 open reading frame 124	NM_001010984
84079	ANKRD27	ankyrin repeat domain 27 (VPS9 domain)	NM_032139
84135	UTP15	UTP15, U3 small nucleolar ribonucleoprotein, homolog (S. cerevisiae)	NM_032175
84138	SLC7A6OS	solute carrier family 7, member 6 opposite strand	NM_032178
84154	RPF2	ribosome production factor 2 homolog (S. cerevisiae)	NM_032194
84168	ANTXR1	anthrax toxin receptor 1	NM_018153
84172	POLR1B	polymerase (RNA) I polypeptide B, 128kDa	NM_001137604
84236	RHBDD1	rhomboid domain containing 1	NM_001167608
84246	MED10	mediator complex subunit 10	NM_032286
84247	LDOC1L	leucine zipper, down-regulated in cancer 1-like	NM_032287

Entrez ID	Gene Symbol	Gene Name	Accession
84268	RPAIN	RPA interacting protein	NM_001033002
84298	LLPH	LLP homolog, long-term synaptic facilitation (Aplysia)	NM_032338
84464	SLX4	SLX4 structure-specific endonuclease subunit homolog (S. cerevisiae)	NM_032444
84498	FAM120B	family with sequence similarity 120B	NM_032448
84515	MCM8	minichromosome maintenance complex component 8	NM_032485
84661	DPY30	dpy-30 homolog (C. elegans)	NM_032574
84701	COX4I2	cytochrome c oxidase subunit IV isoform 2 (lung)	NM_032609
84750	FUT10	fucosyltransferase 10 (alpha (1,3) fucosyltransferase)	NM_032664
84752	B3GNT9	UDP-GlcNAc:betaGal beta-1,3-N-acetylglucosaminyltransferase 9	NM_033309
84775	ZNF607	zinc finger protein 607	NM_001172677
84814	PPAPDC3	phosphatidic acid phosphatase type 2 domain containing 3	NM_032728
84826	SFT2D3	SFT2 domain containing 3	NM_032740
84865	CCDC142	coiled-coil domain containing 142	NM_032779
84866	TMEM25	transmembrane protein 25	NM_001144034
84872	ZC3H10	zinc finger CCCH-type containing 10	NM_032786
84886	C1orf198	chromosome 1 open reading frame 198	NM_001136494
84894	LINGO1	leucine rich repeat and Ig domain containing 1	NM_032808
84930	MASTL	microtubule associated serine/threonine kinase-like	NM_001172303
84939	MUM1	melanoma associated antigen (mutated) 1	NM_032853
84952	CGNL1	cingulin-like 1	NM_032866
85004	RERG	RAS-like, estrogen-regulated, growth inhibitor	NM_001190726
85315	PAQR8	progesterin and adipoQ receptor family member VIII	NM_133367
85376	RIMBP3	RIMS binding protein 3	NM_015672
90293	KLHL13	kelch-like 13 (Drosophila)	NM_001168299
90324	CCDC97	coiled-coil domain containing 97	NM_052848
90780	PYGO2	pygopus homolog 2 (Drosophila)	NM_138300
91373	UAP1L1	UDP-N-acetylglucosamine pyrophosphorylase 1-like 1	NM_207309
91408	BTF3L4	basic transcription factor 3-like 4	NM_001136497
92140	MTDH	metadherin	NM_178812
92181	UBTD2	ubiquitin domain containing 2	NM_152277
92595	ZNF764	zinc finger protein 764	NM_001172679
92806	CENPBD1	CENPB DNA-binding domains containing 1	NM_145039
92856	IMP4	IMP4, U3 small nucleolar	NM_033416

Entrez ID	Gene Symbol	Gene Name	Accession
		ribonucleoprotein, homolog (yeast)	
92999	ZBTB47	zinc finger and BTB domain containing 47 zinc finger and BTB domain containing 47	NM_145166
94039	ZNF101	zinc finger protein 101	NM_033204
94121	SYTL4	synaptotagmin-like 4	NM_001129896
113115	FAM54A	family with sequence similarity 54, member A	NM_001099286
113189	CHST14	carbohydrate (N-acetylgalactosamine 4-O) sulfotransferase 14	NM_130468
113612	CYP2U1	cytochrome P450, family 2, subfamily U, polypeptide 1	NM_183075
114824	PNMA5	paraneoplastic antigen like 5	NM_001103150
116039	OSR2	odd-skipped related 2 (Drosophila) odd-skipped related 2 (Drosophila)	NM_001142462
117581	TWIST2	twist homolog 2 (Drosophila)	NM_057179
118487	CHCHD1	coiled-coil-helix-coiled-coil-helix domain containing 1	NM_203298
122011	CSNK1A1L	casein kinase 1, alpha 1-like	NM_145203
123096	SLC25A29	solute carrier family 25, member 29	NM_001039355
123207	C15orf40	chromosome 15 open reading frame 40	NM_001160113
124790	HEXIM2	hexamethylene bis-acetamide inducible 2	NM_144608
125058	TBC1D16	TBC1 domain family, member 16	NM_019020
126006	PCP2	Purkinje cell protein 2	NM_174895
127703	C1orf216	chromosome 1 open reading frame 216	NM_152374
128637	TBC1D20	TBC1 domain family, member 20	NM_144628
129804	FBLN7	fibulin 7	NM_001128165
129807	NEU4	sialidase 4 sialidase 4	NM_001167599
131965	METTL6	methyltransferase like 6	NM_152396
133584	EGFLAM	EGF-like, fibronectin type III and laminin G domains	NM_152403
140706	C20orf160	chromosome 20 open reading frame 160	NM_080625
140831	ZSWIM3	zinc finger, SWIM-type containing 3	NM_080752
140862	ISM1	isthmin 1 homolog (zebrafish)	NM_080826
146346	LOC146346	hypothetical protein LOC146346	AK057359.1, BX648396.1
148223	C19orf25	chromosome 19 open reading frame 25	NM_152482
148932	MOBK12C	MOB1, Mps One Binder kinase activator-like 2C (yeast)	NM_145279
149111	CNIH3	cornichon homolog 3 (Drosophila)	NM_152495
154141	MBOAT1	membrane bound O-acyltransferase domain containing 1	NM_001080480
154796	AMOT	angiomin	NM_001113490
155061	ZNF746	zinc finger protein 746	NM_001163474
157247	MGC27345	hypothetical protein MGC27345	XR_108807.1

Entrez ID	Gene Symbol	Gene Name	Accession
158293	FAM120AOS	family with sequence similarity 120A opposite strand	NM_198841
163049	ZNF791	zinc finger protein 791	NM_153358
170506	DHX36	DEAH (Asp-Glu-Ala-His) box polypeptide 36	NM_001114397
199745	THAP8	THAP domain containing 8	NM_152658
199857	ALG14	asparagine-linked glycosylation 14 homolog (<i>S. cerevisiae</i>)	NM_144988
200728	TMEM17	transmembrane protein 17	NM_198276
201163	FLCN	folliculin	NM_144606
219539	YPEL4	yippee-like 4 (<i>Drosophila</i>)	NM_145008
220988	HNRNPA3	heterogeneous nuclear ribonucleoprotein A3	NM_194247
221362	LOC221362	hypothetical protein LOC221362	XP_001134277.1
221442	LOC221442	adenylate cyclase 10 pseudogene	NR_026938.2
223082	ZNRF2	zinc and ring finger 2	NM_147128
245812	CNPY4	canopy 4 homolog (zebrafish)	NM_152755
255326	LOC255326	hypothetical protein LOC255326	NR_003611.2
255458	LOC255458	hypothetical protein LOC255458	NR_027183.1
256691	MAMDC2	MAM domain containing 2	NM_153267
259266	ASPM	asp (abnormal spindle) homolog, microcephaly associated (<i>Drosophila</i>)	NM_018136
283130	SLC25A45	solute carrier family 25, member 45	NM_001077241
283635	FAM177A1	family with sequence similarity 177, member A1	NM_001079519
284542	LOC284542	hypothetical protein LOC284542	NM_001194986.1
285313	IGSF10	immunoglobulin superfamily, member 10	NM_001178145
285958	C7orf40	chromosome 7 open reading frame 40	NR_003697.1
339487	ZBTB8OS	zinc finger and BTB domain containing 8 opposite strand	NM_178547
342892	ZNF850	zinc finger protein 850	NM_001193552
360132	FKBP9L	FK506 binding protein 9-like	NR_003949.1
375096	FLJ44670	FLJ44670 protein	NM_080627.2
376497	SLC27A1	solute carrier family 27 (fatty acid transporter), member 1	NM_198580
389033	LOC389033	placenta-specific 9 pseudogene	NR_026740.1
390299	LOC390299	similar to peptidylprolyl isomerase A isoform 1	XM_372452.4
400604	LOC400604	hypothetical LOC400604	XR_109405.1
400629	TEX19	testis expressed 19	NM_207459
440498	HSBP1L1	heat shock factor binding protein 1-like 1	NM_001136180
440796	LOC440796	similar to Gamma-glutamyltranspeptidase 1 precursor (Gamma-glutamyltransferase 1) (CD224 antigen)	NR_003267.1

Example 2 Classification of SSc into Subtypes

As described previously (USSN 13/054,244), Applicant has shown that five distinct SSc subtypes can be identified by different gene expression profiles of a set of intrinsic genes. As used herein, an “intrinsic gene” is a gene that shows little variance within repeated samplings of tissue from an individual subject having scleroderma, but which shows high variance across the same tissue in multiple subjects, wherein the multiple subjects include both subjects having scleroderma and subjects not having scleroderma. For example, an intrinsic gene can be a gene that shows little variance within repeated samplings of forearm-back skin pairs in a subject having scleroderma, but which shows high variance across forearm-back skin pairs of other subjects, wherein the other subjects include both subjects having scleroderma and subjects not having scleroderma.

An intrinsic gene set is a group of genes including one or more intrinsic genes. A minimal intrinsic gene set is defined herein as being derived from an intrinsic gene set, and is comprised of the smallest number of intrinsic genes that can be used to classify a sample.

As described previously, intrinsic gene sets were used to classify scleroderma into a *Diffuse-Proliferation* group or subtype thereof, *Inflammatory* group, *Limited* group or *Normal-Like* group. The *Diffuse-Proliferation* group is composed solely of patients with a diagnosis of dSSc. The *Inflammatory* group includes patients with dSSc, ISSc and morphea. The *Limited* group is composed solely of patients with ISSc. The *Normal-Like* group includes healthy controls along with dSSc and ISSc patients. These intrinsic groups or subsets create a more refined division of the disease than current clinical diagnoses and allow for the assessment of patients in different subsets and their likelihood of responding to therapy. For example, it has been shown that patients in the *Diffuse-Proliferation* group are likely to respond to the drug imatinib mesylate, marketed under the trade name of GLEEVEC® (Novartis Pharmaceuticals, East Hanover, NJ). Furthermore, selected genes from this gene expression signature provide a basis for identifying patients having, or at risk of having, ILD or digital ulcer involvement.

Based on analysis of the ca. 1000 identified intrinsic genes as disclosed, it was possible to categorize non-overlapping sets of genes from within these approximately 1000 intrinsic genes that differentiate the *Diffuse-Proliferation* group, the *Inflammatory* group, the *Limited* group, and the *Normal-Like* group.

Genes that differentiate the *Diffuse-Proliferation* group. There are two major sets of genes that differentiate the *Diffuse-Proliferation* group. One set (Group I) shows higher

expression in the *Diffuse-Proliferation* group and the other set (Group II) shows lower expression in the *Diffuse-Proliferation* group. The *Diffuse-Proliferation* group is also defined in part by the general absence of an *Inflammatory* signature, although there can be some overlap between the *Inflammatory* and *Diffuse-Proliferation* signatures.

Group I genes include 138 genes, the increased expression of which is indicative of the *Diffuse-Proliferation* group. Expression of these genes is decreased in the *Inflammatory*, *Limited*, and *Normal-Like* groups. Referring to Table 3 below, included in the genes of Group I are the following genes, each identified by name: ANP32A, APOH, ATAD2, B3GALT6, B3GAT3, C12orf14, C14orf131, CACNG6, CBLL1, CBX8, CDC7, CDT1, CENPE, CGI-90, CLDN6, CREB3L3, CROC4, DDX3Y, DERP6, DJ971N18.2, EHD2, ESPL1, FGF5, FLJ10902, FLJ12438, FLJ12443, FLJ12484, FLJ12572, FLJ20245, FLJ32009, FLJ35757, FXYD2, GABRA2, GATA2, GK, GSG2, HPS3, IKBKG, IL23A, INSIG1, KIAA1509, KIAA1609, KIAA1666, LDLR, LGALS8, LILRB5, LOC123876, LOC128977, LOC153561, LOC283464, LRRIQ2, LY6K, MAC30, ME2, MGC13186, MGC16044, MGC16075, MGC29784, MGC33839, MGC35212, MGC4293, MICB, MLL5, MTRF1L, MUC20, NICN1, NPTX1, OAS3, OGDHL, OPRK1, PCNT2, PDZK1, PITPNC1, PPFIA4, PREB, PRKY, PSMD11, PSPH, PSPHL, PTP4A3, PXMP2, RAB15, RAD51AP1, RIP, RNF121, RPL41, RPS18, RPS4Y1, RPS4Y2, S100P, SORD, SP1, SYMPK, SYT6, TM9SF4, TMOD3, TNFRSF12A, TPRA40, TRIP, TRPM7, TTR, TUBB4, VARS2L, ZNF572, and ZSCAN2. Also included in the genes of Group I are the following genes, each identified by GenBank accession number only: A_24_BS934268, AB065507, AC007051, AI791206, AK022745, AK022893, AK022997, AK094044, AL391244, AL731541, AL928970, BC010544, BC020847, BM925639, BM928667, ENST00000328708, ENST00000333517, I_1891291, I_3580313, NM_001009569, NM_001024808, NM_172020, NM_173705, NM_178467, NR_001544, THC1434038, THC1484458, THC1504780, U62539, XM_210579, XM_303638, and XM_371684.

Group II genes include 298 genes, the decreased expression of which is also indicative of the *Diffuse-Proliferation* group. Expression of these genes is increased in the *Inflammatory*, *Limited*, and *Normal-Like* groups. Referring to Table 3 below, included in the genes of Group II are the following genes, each identified by name: AADAC, ADAM17, ADH1A, ADH1C, AHNAK, ALG1, ALG5, AMOT, AOX1, AP2A2, ARK5, ARL6IP5, ARMCX1, BECN1, BECN1, BMP8A, BNIP3L, C10orf119, C1orf24, C1orf37, C20orf10, C20orf22, C5orf14, C6orf64, C9orf61, CAPS, CASP4, CASP5, CAST, CAV2, CCDC6,

CCNG2, CDC26, CDK2AP1, CDR1, CFHL1, CNTN3, CPNE5, CRTAP, CTNNA1, CTSC, CUTL1, CXCL5, CYBRD1, CYP2R1, DBN1, DCAMKL1, DCL-1, DIAPH2, DKK2, ECHDC3, ECM2, EIF3S7, EMB, EMCN, EMILIN2, ENPP2, EPB41L2, FBLN1, FBLN2, FEM1A, FGL2, FHL5, FKBP7, FLI1, FLJ10986, FLJ20032, FLJ20701, FLJ23861, FLJ34969, FLJ36748, FLJ36888, FLJ43339, FZR1, GABPB2, GARNL4, GHITM, GHR, GIT2, GLYAT, GPM6B, GTPBP5, HELB, HOXB4, IFNA6, IGFBP5, IL13RA1, IL15, KAZALD1, KCNK4, KCNS3, KCTD10, KIAA0232, KIAA0494, KIAA0562, KIAA0870, KIAA1190, KIF25, KLHL18, KLK2, LAMP2, LEPROTL1, LHFP, LMO2, LOC114990, LOC255458, LOC387680, LOC400027, LOC493869, LOC87769, LRBA, MAFB, MAGEH1, MAN2B2, MCCC2, MEGF10, MFAP5, MGC11308, MGC15523, MGC3200, MGC35048, MGC45780, MOGAT3, MPPE1, MPZ, MYO1B, MYOC, NFYC, NIPSNAP3B, OPTN, OSR2, PAM, PBXIP1, PCOLCE2, PDGFC, PDGFRA, PDGFRL, PEX19, PHAX, PIP, PKM2, PKP2, PMP22, POU2F1, PPAP2B, PRAC, PSMA5, PSORS1C1, PTGIS, RECK, RGS11, RGS5, RIMS3, RIPK2, RNASE4, RNF125, RNF13, RNF146, RNF19, ROBO1, ROBO3, RPL7A, SARA1, SAV1, SCGB1D1, SDK1, SECP43, SECTM1, SERPINB2, SGCA, SH3BGRL, SH3GLB1, SH3RF2, SLC10A3, SLC12A2, SLC14A1, SLC39A14, SLC7A7, SLC9A9, SLPI, SMAD1, SMAP1, SMARCE1, SMP1, SNTG2, SNX7, SOCS5, SSPN, STX7, SUMF1, TAS2R10, TDE2, TFAP2B, TGFBR2, THSD2, TM4SF3, TMEM25, TMEM34, TNA, TNKS2, TRAD, TRAF3IP1, TREM4, TRIM35, TRIM9, TTYH2, TUBB1, UBL3, ULK2, URB, USP54, UST, UTRN, UTX, WIF1, WWOX, XG, YPEL5, and ZFHX1B. Also included in the genes of Group II are the following genes, each identified by GenBank accession number only: A_32_BS169243, A_32_BS200773, A_32_BS53976, AC025463, AF124368, AF161364, AF318337, AF372624, AK001565, AK022793, AK055621, AK056856, AL050042, AL137761, BC035102, BC038761, BC039664, BG252130, BI014689, D80006, ENST00000298643, ENST00000300068, ENST00000305402, ENST00000307901, ENST00000321656, ENST00000322803, ENST00000329246, ENST00000331640, ENST00000332271, ENST00000333784, H16080, I_1861543, I_1882608, I_1985061, I_3335767, I_3551568, I_3588329, I_932413, I_962800, I_966091, NM_001008528, NM_001009555, NM_001013632, NM_001014975, NM_001018006, NM_001018076, NM_001025077, NM_003671, NM_014758, NM_015262, NM_138411, NM_153030, NM_173709, NM_213595, NR_002184, S62210, THC1419743, THC1429821, THC1457118, THC1459712, THC1461073, THC1506312, THC1511927, THC1515028, THC1525318,

THC1531579, THC1544941, THC1551463, THC1559236, THC1560798, THC1563147, THC1572906, THC1574967, THC1591470, XM_165930, and XM_209429.

Genes that differentiate the *Inflammatory* group. The *Inflammatory* group is identified by increased expression of a group of 119 genes in Group III. These genes show low expression in the *Diffuse-Proliferation*, *Limited*, and *Normal-Like* groups. Referring to Table 3 below, included in the genes of Group III are the following genes, each identified by name: A2M, AIF1, ALOX5AP, APOL2, APOL3, BATF, BCL3, BIRC1, BTN3A2, C10orf10, C1orf38, C6orf80, CCL2, CCL4, CCR5, CD8A, CDW52, COL6A3, COTL1, CPA3, CPVL, CTAG1B, DDX58, EBI2, EVI2B, F13A1, FAM20A, FAP, FCGR3A, FLJ11259, FLJ22573, FLJ23221, FLJ25200, FYB, GBP1, GBP3, GEM, GIMAP6, GMFG, GZMH, GZMK, HAVCR2, HCLS1, HLA-DMA, HLA-DOA, HLA-DPA1, HLA-DPB1, HLA-DQA1, HLA-DQA2, HLA-DQB1, HLA-DRB1, HLA-DRB5, ICAM2, IFI16, IFI16, IFIT1, IFIT2, IFITM1, IFITM2, IFITM3, IL10RA, INDO, ITGB2, KIAA0063, LAMB1, LCPI1, LGALS2, LGALS9, LILRB2, LOC387763, LOC400759, LUM, LYZ, MARCKS, MFNG, MGC24133, MPEG1, MRC1, MRCL3, MS4A6A, MX1, NNMT, NUP62, PAG, PLA1, PPIC, PPIC, PTPRC, RAC2, RGS10, RGS16, RSAFD1, SAT, SCGB2A1, SLC20A1, SLCO2B1, SPARC, SULF1, TAP1, TCTEL1, TIMP1, TNFSF4, UBD, VSIG4, and ZFYVE26. Also included in the genes of Group III are the following genes, each identified by GenBank accession number only: AF533936, BQ049338, ENST00000310210, ENST00000313904, ENST00000329660, I_1000437, I_966691, M15073, NM_001010919, NM_001025201, NM_001033569, THC1543691, and XM_291496.

In one embodiment the *Inflammatory* group, and likewise a subject that can be categorized as falling within the *Inflammatory* group, can be identified by the increased expression of any one or more genes within Group III.

In one embodiment the *Inflammatory* group, and likewise a subject that can be categorized as falling within the *Inflammatory* group, can be identified by the increased expression of any one or more genes within Group III and the decreased expression of any one or more genes in Group I.

In one embodiment the *Inflammatory* group, and likewise a subject that can be categorized as falling within the *Inflammatory* group, can be identified by the increased expression of any one or more genes within Group III and the increased expression of any one or more genes within Group II.

In one embodiment the *Inflammatory* group, and likewise a subject that can be categorized as falling within the *Inflammatory* group, can be identified by the increased expression of any one or more genes within Group III, the decreased expression of any one or more genes in Group I, and the increased expression of any one or more genes within Group II.

TABLE 3

Gene Symbol	Gene Name	Accession
A2M	Alpha-2-macroglobulin	M36501
AADAC	Arylacetamide deacetylase (esterase)	NM_001086
ACTB	Actin, beta	NM_001101
ADAM17	A disintegrin and metalloproteinase domain 17 (tumor necrosis factor, alpha, converting enzyme)	NM_003183
ADH1A	Alcohol dehydrogenase 1A (class I), alpha polypeptide	NM_000667
ADH1C	Alcohol dehydrogenase 1C (class I), gamma polypeptide	NM_000669
AHNAK	AHNAK nucleoprotein (desmoyokin)	NM_024060
AIFI	Allograft inflammatory factor 1	NM_004847
AKAP13	A kinase (PRKA) anchor protein 13	AF406992
ALG1	Asparagine-linked glycosylation 1 homolog (yeast, beta-1,4-mannosyltransferase)	NM_019109
ALG2	Asparagine-linked glycosylation 2 homolog (yeast, alpha-1,3-mannosyltransferase)	NM_033087
ALG5	Asparagine-linked glycosylation 5 homolog (yeast, dolichyl-phosphate beta-glucosyltransferase)	NM_013338
ALOX5AP	Arachidonate 5-lipoxygenase-activating protein	NM_001629
ALS2CR13	Amyotrophic lateral sclerosis 2 (juvenile) chromosome region, candidate 13	NM_004703
ALX3	Aristaless-like homeobox 3	NM_006492
AMFR	Autocrine motility factor receptor	NM_138958
AMOT	Angiomotin	NM_133265
ANP32A	Acidic (leucine-rich) nuclear phosphoprotein 32 family, member A	AK021784
AOX1	Aldehyde oxidase 1	NM_001159
AP2A2	Adaptor-related protein complex 2, alpha 2 subunit	NM_012305
APOH	Apolipoprotein H (beta-2-glycoprotein I)	NM_000042
APOL2	Apolipoprotein L, 2	NM_030882
APOL3	Apolipoprotein L, 3	NM_145640
ARHGEF10	Rho guanine nucleotide exchange factor (GEF) 10	NM_014629
ARK5	AMP-activated protein kinase family member 5	NM_014840
ARL6IP5	ADP-ribosylation-like factor 6 interacting protein 5	NM_006407
ARMCX1	Armadillo repeat containing, X-linked 1	NM_016608
ARX	Aristaless related homeobox	NM_139058
ASCL3	Achaete-scute complex (Drosophila) homolog-like 3	NM_020646
ATAD2	ATPase family, AAA domain containing 2	NM_014109
ATP1A4	ATPase, Na ⁺ /K ⁺ transporting, alpha 4 polypeptide	NM_144699

ATP6V1B2	ATPase, H ⁺ transporting, lysosomal 56/58kDa, VI subunit B, isoform 2	NM_001693
AVPI1	Arginine vasopressin-induced 1	NM_021732
AXL	AXL receptor tyrosine kinase	NM_001699
B3GALT6	UDP-Gal:betaGal beta 1,3-galactosyltransferase polypeptide 6	NM_080605
B3GAT3	Beta-1,3-glucuronyltransferase 3 (glucuronosyltransferase 1)	NM_012200
B3GTL	Beta 3-glycosyltransferase-like	BC032021
BAALC	Brain and acute leukemia, cytoplasmic	NM_024812
BATF	Basic leucine zipper transcription factor, ATF-like	NM_006399
BCAR1	Breast cancer anti-estrogen resistance 1	NM_014567
BCKDHB	Branched chain keto acid dehydrogenase E1, beta polypeptide (maple syrup urine disease)	NM_183050
BCL3	B-cell CLL/lymphoma 3	NM_005178
BECN1	Beclin 1 (coiled-coil, myosin-like BCL2 interacting protein)	NM_003766
BECN1	Beclin 1 (coiled-coil, myosin-like BCL2 interacting protein)	NM_003766
BEXL1	Brain expressed X-linked-like 1	XM_043653
BIRC1	Baculoviral IAP repeat-containing 1	NM_004536
Bles03	Basophilic leukemia expressed protein BLES03	NM_031450
BMP8A	Bone morphogenetic protein 8a	AK093659
BNIP3L	BCL2/adenovirus E1B 19kDa interacting protein 3-like	AF067396
BNIP3L	BCL2/adenovirus E1B 19kDa interacting protein 3-like	NM_004331
BTN3A2	Butyrophilin, subfamily 3, member A2	NM_007047
C10orf10	Chromosome 10 open reading frame 10	NM_007021
C10orf119	Chromosome 10 open reading frame 119	NM_024834
C10orf9	Chromosome 10 open reading frame 9	NM_145012
C12orf14	Chromosome 12 open reading frame 14	NM_021238
C14orf131	Chromosome 14 open reading frame 131	NM_018335
C1orf24	Chromosome 1 open reading frame 24	NM_052966
C1orf37	Chromosome 1 open reading frame 37	CR591805
C1orf38	Chromosome 1 open reading frame 38	NM_004848
C1orf42	Chromosome 1 open reading frame 42	NM_019060
C20orf10	Chromosome 20 open reading frame 10	NM_014477
C20orf22	Chromosome 20 open reading frame 22	NM_015600
C4.4A	GPI-anchored metastasis-associated protein homolog	NM_014400
C5orf14	Chromosome 5 open reading frame 14	NM_024715
C6orf27	Chromosome 6 open reading frame 27	NM_025258
C6orf64	Chromosome 6 open reading frame 64	NM_018322
C6orf80	Chromosome 6 open reading frame 80	NM_015439
C7orf19	Chromosome 7 open reading frame 19	NM_032831
C9orf61	Chromosome 9 open reading frame 61	NM_004816
CABP7	Calcium binding protein 7	NM_182527
CACNA2D1	Calcium channel, voltage-dependent, alpha 2/delta subunit 1	NM_000722
CACNG6	Calcium channel, voltage-dependent, gamma subunit 6	NM_145814
CAPN10	Calpain 10	NM_021251
CAPS	Calcyphosine	NM_004058
CASP4	Caspase 4, apoptosis-related cysteine protease	NM_033307
CASP5	Caspase 5, apoptosis-related cysteine protease	NM_004347
CAST	Calpastatin	NM_173060

CAV2	Caveolin 2	NM_001233
CBLL1	Cas-Br-M (murine) ecotropic retroviral transforming sequence-like 1	NM_024814
CBX8	Chromobox homolog 8 (Pc class homolog, Drosophila)	NM_020649
CCDC6	Coiled-coil domain containing 6	S72869
CCL2	Chemokine (C-C motif) ligand 2	NM_002982
CCL4	Chemokine (C-C motif) ligand 4	NM_002984
CCNG2	Cyclin G2	NM_004354
CCNG2	Cyclin G2	NM_004354
CCNT2	Cyclin T2	NM_058241
CCR5	Chemokine (C-C motif) receptor 5	NM_000579
CCT5	Chaperonin containing TCPI, subunit 5 (epsilon)	NM_012073
CD33	CD33 antigen (gp67)	NM_001772
CD86	CD86 antigen (CD28 antigen ligand 2, B7-2 antigen)	NM_006889
CD8A	CD8 antigen, alpha polypeptide (p32)	NM_001768
CDC26	Cell division cycle 26	NM_139286
CDC37	CDC37 cell division cycle 37 homolog (S. cerevisiae)	NM_007065
CDC7	CDC7 cell division cycle 7 (S. cerevisiae)	NM_003503
CDK2AP1	CDK2-associated protein 1	NM_004642
CDR1	Cerebellar degeneration-related protein 1, 34kDa	NM_004065
CDT1	DNA replication factor	NM_030928
CDW52	CDW52 antigen (CAMPATH-1 antigen)	NM_001803
CEBPD	CCAAT/enhancer binding protein (C/EBP), delta	NM_005195
CENPE	Centromere protein E, 312kDa	NM_001813
CFHL1	Complement factor H-related 1	NM_002113
CGI-111	CGI-111 protein	NM_016048
CGI-90	CGI-90 protein	NM_016033
CISH	Cytokine inducible SH2-containing protein	NM_145071
CKLFSF1	Chemokine-like factor super family 1	NM_181294
CLDN6	Claudin 6	NM_021195
CLIPR-59	CLIP-170-related protein	BC013116
CLYBL	Citrate lyase beta like	NM_138280
CNFN	Cornifelin	NM_032488
CNTN3	Contactin 3 (plasmacytoma associated)	AB040929
COL1A2	Collagen, type I, alpha 2	NM_000089
COL6A2	Collagen, type VI, alpha 2	NM_001849
COL6A3	Collagen, type VI, alpha 3	NM_057165
COMMD2	COMM domain containing 2	NM_016094
COTL1	Coactosin-like 1 (Dictyostelium)	NM_021149
COX5A	Cytochrome c oxidase subunit Va	AA129107
CPA3	Carboxypeptidase A3 (mast cell)	NM_001870
CPNE5	Copine V	NM_020939
CPVL	Carboxypeptidase, vitellogenic-like	NM_019029
CRBN	Cereblon	AF130117
CREB3L3	CAMP responsive element binding protein 3-like 3	NM_032607
CRLF1	Cytokine receptor-like factor 1	NM_004750
CROC4	Transcriptional activator of the c-fos promoter	NM_006365
CRTAP	Cartilage associated protein	NM_006371
CTAG1B	Cancer/testis antigen 1B	NM_139250
CTAGE4	CTAGE family, member 4	XM_496933
CTNNA1	Catenin (cadherin-associated protein), alpha 1, 102kDa	NM_001903
CTSC	Cathepsin C	NM_001814

CTSH	Cathepsin H	NM_148979
CUTL1	Cut-like 1, CCAAT displacement protein (Drosophila)	NM_181500
CXCL5	Chemokine (C-X-C motif) ligand 5	NM_002994
CYBRD1	Cytochrome b reductase 1	NM_024843
CYP2R1	Cytochrome P450, family 2, subfamily R, polypeptide 1	NM_024514
CYP4V2	Cytochrome P450, family 4, subfamily V, polypeptide 2	NM_207352
DBN1	Drebrin 1	NM_004395
DCAMKL1	Doublecortin and CaM kinase-like 1	NM_004734
DCL-1	Type 1 transmembrane C-type lectin receptor DCL-1	NM_014880
DDX3Y	DEAD (Asp-Glu-Ala-Asp) box polypeptide 3, Y-linked	NM_004660
DDX58	DEAD (Asp-Glu-Ala-Asp) box polypeptide 58	NM_014314
DDX6	DEAD (Asp-Glu-Ala-Asp) box polypeptide 6	AK021715
DERP6	S-phase 2 protein	NM_015362
DIAPH2	Diaphanous homolog 2 (Drosophila)	NM_006729
DICER1	Dicer1, Dcr-1 homolog (Drosophila)	NM_177438
DIRC1	Disrupted in renal carcinoma 1	NM_052952
DJ971N18.2	Hypothetical protein DJ971N18.2	NM_021156
DJ971N18.2	Hypothetical protein DJ971N18.2	NM_021156
DKFZp761C169	Vasculin	CR621588
DKK2	Dickkopf homolog 2 (Xenopus laevis)	NM_014421
DNCL1	Dynein, cytoplasmic, light polypeptide 1	NM_003746
DPCD	Deleted in a mouse model of primary ciliary dyskinesia	AF264625
DPP3	Dipeptidylpeptidase 3	NM_005700
DREV1	DORA reverse strand protein 1	NM_016025
EBI2	Epstein-Barr virus induced gene 2 (lymphocyte-specific G protein-coupled receptor)	NM_004951
ECHDC3	Enoyl Coenzyme A hydratase domain containing 3	NM_024693
ECM2	Extracellular matrix protein 2, female organ and adipocyte specific	NM_001393
EDG4	Endothelial differentiation, lysophosphatidic acid G-protein-coupled receptor, 4	NM_004720
EGFL3	EGF-like-domain, multiple 3	NM_001409
EHD2	EH-domain containing 2	BC062554
EIF3S3	Eukaryotic translation initiation factor 3, subunit 3 gamma, 40kDa	NM_003756
EIF3S7	Eukaryotic translation initiation factor 3, subunit 7 zeta, 66/67kDa	NM_003753
EIF3S8	Eukaryotic translation initiation factor 3, subunit 8, 110kDa	NM_003752
EIF4B	Eukaryotic translation initiation factor 4B	NM_001417
ELA1	Elastase 1, pancreatic	NM_001971
EMB	Embiggin homolog (mouse)	U52054
EMCN	Endomucin	AL133118
EMILIN2	Elastin microfibril interfacer 2	NM_032048
EMR2	Egf-like module containing, mucin-like, hormone receptor-like 2	NM_152918
ENPP2	Ectonucleotide pyrophosphatase/phosphodiesterase 2 (autotaxin)	NM_006209
EPB41L2	Erythrocyte membrane protein band 4.1-like 2	NM_001431
ESM1	Endothelial cell-specific molecule 1	NM_007036
ESPL1	Extra spindle poles like 1 (S. cerevisiae)	NM_012291

ESRRB	Estrogen-related receptor beta	NM_004452
ET	Hypothetical protein ET	NM_024311
EVI2B	Ecotropic viral integration site 2B	NM_006495
EXOSC6	Exosome component 6	NM_058219
FI3A1	Coagulation factor XIII, A1 polypeptide	NM_000129
F7	Coagulation factor VII (serum prothrombin conversion accelerator)	AF272774
FABP7	Fatty acid binding protein 7, brain	NM_001446
FAM12A	Family with sequence similarity 12, member A	NM_006683
FAM20A	Family with sequence similarity 20, member A	NM_017565
FAP	Fibroblast activation protein, alpha	NM_004460
FBLN1	Fibulin 1	NM_006486
FBLN2	Fibulin 2	NM_001998
FCGR3A	Fc fragment of IgG, low affinity IIIb, receptor for (CD16)	NM_000569
FEM1A	Fem-1 homolog a (C.elegans)	NM_018708
FER1L3	Fer-1-like 3, myoferlin (C. elegans)	NM_133337
FGF19	Fibroblast growth factor 19	NM_005117
FGF5	Fibroblast growth factor 5	NM_004464
FGL2	Fibrinogen-like 2	NM_006682
FHL5	Four and a half LIM domains 5	NM_020482
FKBP5	FK506 binding protein 5	NM_004117
FKBP7	FK506 binding protein 7	NM_181342
FKSG2	Apoptosis inhibitor	NM_021631
FLI1	Friend leukemia virus integration 1	NM_002017
FLJ10647	Hypothetical protein FLJ10647	NM_018166
FLJ10781	Hypothetical protein FLJ10781	NM_018215
FLJ10902	Hypothetical protein FLJ10902	BC021277
FLJ10986	Hypothetical protein FLJ10986	NM_018291
FLJ11259	Hypothetical protein FLJ11259	NM_018370
FLJ12363	Hypothetical protein FLJ12363	NM_032167
FLJ12438	Hypothetical protein FLJ12438	NM_021933
FLJ12443	Hypothetical protein FLJ12443	NM_024830
FLJ12484	Hypothetical protein FLJ12484	NM_022767
FLJ12572	Hypothetical protein FLJ12572	AF411456
FLJ12748	Hypothetical protein FLJ12748	NM_024871
FLJ20032	Hypothetical protein FLJ20032	AK000039
FLJ20245	Hypothetical protein FLJ20245	NM_017723
FLJ20701	Hypothetical protein FLJ20701	NM_017933
FLJ21616	Hypothetical protein FLJ21616	NM_024567
FLJ22573	Hypothetical protein FLJ22573	NM_024660
FLJ23221	Hypothetical protein FLJ23221	NM_024579
FLJ23861	Hypothetical protein FLJ23861	NM_152519
FLJ25200	Hypothetical protein FLJ25200	NM_144715
FLJ25222	CXYorf1-related protein	NM_199163
FLJ31882	Hypothetical protein FLJ31882	NM_152460
FLJ32009	Hypothetical protein FLJ32009	NM_152718
FLJ34969	Hypothetical protein FLJ34969	NM_152678
FLJ35390	Hypothetical protein FLJ35390	XM_379820
FLJ35757	Hypothetical protein FLJ35757	NM_152598
FLJ35775	Hypothetical protein FLJ35775	NM_152418
FLJ36748	Hypothetical protein FLJ36748	NM_152406
FLJ36888	Hypothetical protein FLJ36888	NM_178830
FLJ38379	Hypothetical protein FLJ38379	NM_178530
FLJ39441	Hypothetical protein FLJ39441	NM_194285
FLJ43339	FLJ43339 protein	CR749408
FLJ44896	FLJ44896 protein	BQ189189

FLJ90661	Hypothetical protein FLJ90661	NM_173502
FN3KRP	Fructosamine-3-kinase-related protein	NM_024619
FXN	Frataxin	NM_000144
FXVD2	FXVD domain containing ion transport regulator 2	NM_021603
FYB	FYN binding protein (FYB-120/130)	NM_001465
FZR1	Fizzy/cell division cycle 20 related 1 (Drosophila)	NM_016263
G1P2	Interferon, alpha-inducible protein (clone IFI-15K)	NM_005101
G1P3	Interferon, alpha-inducible protein (clone IFI-6-16)	NM_022873
GABPB2	GA binding protein transcription factor, beta subunit 2, 47kDa	BC009935
GABRA2	Gamma-aminobutyric acid (GABA) A receptor, alpha 2	NM_000807
GARNL4	GTPase activating Rap/RanGAP domain-like 4	NM_015085
GATA2	GATA binding protein 2	NM_032638
GBP1	Guanylate binding protein 1, interferon-inducible, 67kDa	NM_002053
GBP3	Guanylate binding protein 3	NM_018284
GEM	GTP binding protein overexpressed in skeletal muscle	NM_005261
GFAP	Glial fibrillary acidic protein	NM_002055
GH1	Growth hormone 1	NM_000515
GHITM	Growth hormone inducible transmembrane protein	NM_014394
GHR	Growth hormone receptor	NM_000163
GIMAP6	GTPase, IMAF family member 6	NM_024711
GIT2	G protein-coupled receptor kinase interactor 2	NM_057170
GK	Glycerol kinase	NM_203391
GLIPR1	GLI pathogenesis-related 1 (glioma)	NM_006851
GLYAT	Glycine-N-acyltransferase	NM_005838
GMFG	Glia maturation factor, gamma	NM_004877
GPM6B	Glycoprotein M6B	NM_005278
GPSM1	G-protein signalling modulator 1 (AGS3-like, C. elegans)	AL117478
GPT	Glutamic-pyruvate transaminase (alanine aminotransferase)	NM_005309
GPX7	Glutathione peroxidase 7	NM_015696
GRINL1A	Glutamate receptor, ionotropic, N-methyl D-aspartate-like 1A	AK074767
GRIPAP1	GRIP1 associated protein 1	AB032993
GSG2	Haspin	AK056691
GSPT2	G1 to S phase transition 2	NM_018094
GSTM1	Glutathione S-transferase M1	NM_000561
GSTM3	Glutathione S-transferase M3 (brain)	NM_000849
GSTT1	Glutathione S-transferase theta 1	NM_000853
GSTT1	Glutathione S-transferase theta 1	NM_000853
GSTT2	Glutathione S-transferase theta 2	NM_000854
GSTT2	Glutathione S-transferase theta 2	NM_000854
GTF3C5	General transcription factor IIIC, polypeptide 5, 63kDa	NM_012087
GTPBP5	GTP binding protein 5 (putative)	NM_015666
GTPBP6	GTP binding protein 6 (putative)	NM_012227
GZMH	Granzyme H (cathepsin G-like 2, protein h-CCPX)	NM_033423

GZMK	Granzyme K (serine protease, granzyme 3; tryptase II)	NM_002104
H1FO	H1 histone family, member 0	NM_005318
HARS	Histidyl-tRNA synthetase	NM_002109
HAVCR2	Hepatitis A virus cellular receptor 2	NM_032782
HCLS1	Hematopoietic cell-specific Lyn substrate 1	NM_005335
HELB	Helicase (DNA) B	NM_033647
HEPH	Hephaestin	NM_138737
HERPUD1	Homocysteine-inducible, endoplasmic reticulum stress-inducible, ubiquitin-like domain member 1	NM_014685
HLA-A	Major histocompatibility complex, class I, A	BC020891
HLA-B	Major histocompatibility complex, class I, B	NM_005514
HLA-DMA	Major histocompatibility complex, class II, DM alpha	NM_006120
HLA-DOA	Major histocompatibility complex, class II, DO alpha	M38054
HLA-DOA	Major histocompatibility complex, class II, DO alpha	NM_002119
HLA-DPA1	Major histocompatibility complex, class II, DP alpha 1	NM_033554
HLA-DPB1	Major histocompatibility complex, class II, DP beta 1	NM_002121
HLA-DQA1	Major histocompatibility complex, class II, DQ alpha 1	NM_002122
HLA-DQA2	Major histocompatibility complex, class II, DQ alpha 2	NM_020056
HLA-DQB1	Major histocompatibility complex, class II, DQ beta 1	M20432
HLA-DRB1	Major histocompatibility complex, class II, DR beta 4	NM_002124
HLA-DRB5	Major histocompatibility complex, class II, DR beta 4	NM_002125
HLA-E	Major histocompatibility complex, class I, E	NM_005516
HLA-E	Major histocompatibility complex, class I, E	NM_005516
HLA-E	Major histocompatibility complex, class I, E	NM_005516
HLA-F	Major histocompatibility complex, class I, F	NM_018950
HLA-G	HLA-G histocompatibility antigen, class I, G	NM_002127
HOXB4	Homeo box B4	NM_024015
HPS3	Hermansky-Pudlak syndrome 3	NM_032383
HRAS	V-Ha-ras Harvey rat sarcoma viral oncogene homolog	NM_176795
HSPBP1	Hsp70-interacting protein	NM_012267
ICAM2	Intercellular adhesion molecule 2	NM_000873
IFI16	Interferon, gamma-inducible protein 16	BC017059
IFI16	Interferon, gamma-inducible protein 16	NM_005531
IFIT1	Interferon-induced protein with tetratricopeptide repeats 1	NM_001001887
IFIT2	Interferon-induced protein with tetratricopeptide repeats 2	NM_001547
IFITM1	Interferon induced transmembrane protein 1 (9-27)	NM_003641
IFITM2	Interferon induced transmembrane protein 2 (1-8D)	NM_006435
IFITM3	Interferon induced transmembrane protein 3 (1-8U)	NM_021034
IFNA6	Interferon, alpha 6	NM_021002
IGFBP5	Insulin-like growth factor binding protein 5	NM_000599
IGH@	Immunoglobulin heavy locus	BC040042

IGHG4	Immunoglobulin heavy constant gamma 4 (G4m marker)	BC025985
IGKC	Immunoglobulin kappa constant	AJ399872
IGKC	Immunoglobulin kappa constant	BC030813
IGLL1	Immunoglobulin lambda-like polypeptide 1	NM_152855
IGLL1	Immunoglobulin lambda-like polypeptide 1	NM_152855
IKBKG	Inhibitor of kappa light polypeptide gene enhancer in B-cells, kinase gamma	NM_003639
IL10RA	Interleukin 10 receptor, alpha	NM_001558
IL13RA1	Interleukin 13 receptor, alpha 1	NM_001560
IL15	Interleukin 15	NM_172175
IL23A	Interleukin 23, alpha subunit p19	NM_016584
IL27	Interleukin 27	NM_145659
INDO	Indoleamine-pyrrole 2,3 dioxygenase	NM_002164
INSIG1	Insulin induced gene 1	NM_005542
IQCF2	IQ motif containing F2	NM_203424
IRF5	Interferon regulatory factor 5	NM_032643
IRF7	Interferon regulatory factor 7	NM_004030
IRX3	Iroquois homeobox protein 3	NM_024336
IRX5	Iroquois homeobox protein 5	NM_005853
ITGAL	Integrin, alpha L (antigen CD11A (p180), lymphocyte function-associated antigen 1; alpha polypeptide)	NM_002209
ITGB1	Integrin, beta 1 (fibronectin receptor, beta polypeptide, antigen CD29 includes MDF2, MSK12)	NM_033666
ITGB1BP1	Integrin beta 1 binding protein 1	NM_004763
ITGB2	Integrin, beta 2 (antigen CD18 (p95), lymphocyte function-associated antigen 1; macrophage antigen 1 (mac-1) beta subunit)	NM_000211
ITLN1	Intelectin 1 (galactofuranose binding)	NM_017625
KAZALD1	Kazal-type serine protease inhibitor domain 1	NM_030929
KCNK4	Potassium channel, subfamily K, member 4	NM_016611
KCNS3	Potassium voltage-gated channel, delayed-rectifier, subfamily S, member 3	NM_002252
KCTD10	Potassium channel tetramerisation domain containing 10	NM_031954
KCTD15	Potassium channel tetramerisation domain containing 15	NM_024076
KEL	Kell blood group	NM_000420
KIAA0063	KIAA0063 gene product	NM_014876
KIAA0232	KIAA0232 gene product	NM_014743
KIAA0467	KIAA0467 protein	NM_015284
KIAA0494	KIAA0494 gene product	NM_014774
KIAA0562	Glycine-, glutamate-, thienylcyclohexylpiperidine-binding protein	NM_014704
KIAA0664	KIAA0664 protein	NM_015229
KIAA0676	KIAA0676 protein	NM_015043
KIAA0870	KIAA0870 protein	NM_014957
KIAA1190	Hypothetical protein KIAA1190	NM_145166
KIAA1463	KIAA1463 protein	NM_173602
KIAA1509	KIAA1509	XM_029353
KIAA1609	KIAA1609 protein	NM_020947
KIAA1666	KIAA1666 protein	XM_371429
KIAA1683	KIAA1683	NM_025249
KIF25	Kinesin family member 25	NM_005355
KLF9	Kruppel-like factor 9	NM_001206
KLHL18	Kelch-like 18 (Drosophila)	AB018338

KLK2	Kallikrein 2, prostatic	NM_005551
KRT20	Keratin 20	NM_019010
LAMB1	Laminin, beta 1	NM_002291
LAMP2	Lysosomal-associated membrane protein 2	NM_013995
LAMR1P15	Laminin receptor 1 pseudogene 15	AF284768
LCP1	Lymphocyte cytosolic protein 1 (L-plastin)	NM_002298
LDLR	Low density lipoprotein receptor (familial hypercholesterolemia)	M28219
LEPR	Leptin receptor	NM_017526
LEPROTL1	Leptin receptor overlapping transcript-like 1	AF359269
LGALS2	Lectin, galactoside-binding, soluble, 2 (galectin 2)	NM_006498
LGALS8	Lectin, galactoside-binding, soluble, 8 (galectin 8)	NM_201543
LGALS9	Lectin, galactoside-binding, soluble, 9 (galectin 9)	NM_002308
LHFP	Lipoma HMGIC fusion partner	NM_005780
LILRB2	Leukocyte immunoglobulin-like receptor, subfamily B (with TM and ITIM domains), member 2	NM_005874
LILRB5	Leukocyte immunoglobulin-like receptor, subfamily B (with TM and ITIM domains), member 5	NM_006840
LMO2	LIM domain only 2 (rhombotin-like 1)	NM_005574
LMOD1	Leiomodin 1 (smooth muscle)	AW939148
LMOD1	Leiomodin 1 (smooth muscle)	NM_012134
LOC114990	Vasorin	NM_138440
LOC123876	Xenobiotic/medium-chain fatty acid:CoA ligase	NM_182617
LOC128977	Hypothetical protein LOC128977	NM_173793
LOC142678	Skeletrophin	NM_080875
LOC147645	Hypothetical protein LOC147645	XM_085831
LOC153561	Hypothetical LOC389295	NM_207331
LOC255458	Hypothetical protein LOC255458	BC009038
LOC283464	Hypothetical protein LOC283464	XM_290597
LOC284323	Hypothetical protein LOC284323	AK091274
LOC339834	Hypothetical protein LOC339834	NM_178173
LOC387680	Similar to KIAA0592 protein	NM_001005751
LOC387763	Hypothetical LOC387763	XM_373497
LOC400027	Hypothetical gene supported by BC047417	XM_378350
LOC400581	GRB2-related adaptor protein-like	BC026233
LOC400759	Similar to Interferon-induced guanylate-binding protein 1 (GTP-binding protein 1) (Guanine nucleotide-binding protein 1) (HuGBP-1)	XM_375747
LOC401565	Similar to 4931415M17 protein	NM_001001710
LOC441245	Hypothetical LOC441245	XM_496889
LOC493869	Similar to RIKEN cDNA 2310016C16	AK022110
LOC51035	ORF	NM_015853
LOC87769	Hypothetical protein BC004360	XM_373431
LOC91689	Hypothetical gene supported by AL449243	NM_033318
LPXN	Leupaxin	NM_004811
LRAP	Leukocyte-derived arginine aminopeptidase	NM_022350
LRBA	LPS-responsive vesicle trafficking, beach and anchor containing	NM_006726
LRRC14	Leucine rich repeat containing 14	NM_014665
LRRC2	Leucine rich repeat containing 2	NM_024512
LRRIQ2	Leucine-rich repeats and IQ motif containing 2	NM_024548
LTBP4	Latent transforming growth factor beta binding protein 4	AF051344

LTBP4	Latent transforming growth factor beta binding protein 4	NM_003573
LUM	Lumican	NM_002345
LY6K	Lymphocyte antigen 6 complex, locus K	NM_017527
LY6K	Lymphocyte antigen 6 complex, locus K	NM_017527
LYZ	Lysozyme (renal amyloidosis)	NM_000239
MAB21L2	Mab-21-like 2 (C. elegans)	NM_006439
MAC30	Hypothetical protein MAC30	NM_014573
MAFB	V-maf musculoaponeurotic fibrosarcoma oncogene homolog B (avian)	NM_005461
MAGEH1	Melanoma antigen, family H, 1	NM_014061
MAN2B2	Mannosidase, alpha, class 2B, member 2	NM_015274
MARCH-II	Membrane-associated RING-CH protein II	NM_016496
MARCKS	Myristoylated alanine-rich protein kinase C substrate	NM_002356
MCCC1	Methylcrotonoyl-Coenzyme A carboxylase 1 (alpha)	NM_020166
MCCC2	Methylcrotonoyl-Coenzyme A carboxylase 2 (beta)	AK001948
ME2	Malic enzyme 2, NAD(+)-dependent, mitochondrial	BC000147
MED19	Mediator of RNA polymerase II transcription, subunit 19 homolog (yeast)	NM_153450
MEGF10	MEGF10 protein	BC020198
MERTK	C-mer proto-oncogene tyrosine kinase	U08023
MFAP5	Microfibrillar associated protein 5	NM_003480
MFNG	Manic fringe homolog (Drosophila)	NM_002405
MGC10772	Hypothetical protein MGC10772	NM_030567
MGC11308	Hypothetical protein MGC11308	NM_032889
MGC13186	Hypothetical protein MGC13186	NM_032324
MGC15523	Hypothetical protein MGC15523	BC020925
MGC15875	Hypothetical protein MGC15875	AK090397
MGC16044	Hypothetical protein MGC16044	NM_138371
MGC16075	Hypothetical protein MGC16075	XM_498434
MGC21654	Unknown MGC21654 product	NM_145647
MGC23918	Hypothetical protein MGC23918	NM_144716
MGC24133	Hypothetical protein MGC24133	NM_174896
MGC27165	Hypothetical protein MGC27165	AK027379
MGC29784	Hypothetical protein MGC29784	NM_173659
MGC29937	Hypothetical protein MGC29937	NM_144597
MGC3169	Hypothetical protein MGC3169	NM_024074
MGC3200	Hypothetical protein LOC284615	NM_032305
MGC33839	Hypothetical protein MGC33839	NM_152353
MGC35045	Chromosome 19 open reading frame 16	AL834316
MGC35048	Hypothetical protein MGC35048	NM_153208
MGC35212	Hypothetical protein MGC35212	NM_152764
MGC39584	Hypothetical gene supported by BC029568	BC029568
MGC42157	Hypothetical locus MGC42157	XM_499573
MGC4293	Hypothetical protein MGC4293	NM_031304
MGC45428	Hypothetical protein MGC45428	NM_152619
MGC45780	Hypothetical protein MGC45780	NM_173833
MGC8721	Hypothetical protein MGC8721	NM_016127
MGC9515	Hypothetical protein MGC9515	BC036263
MICB	MHC class I polypeptide-related sequence B	NM_005931
MIS12	MIS12 homolog (yeast)	NM_024039
MKRN1	Makorin, ring finger protein, 1	NM_013446

MLL5	Myeloid/lymphoid or mixed-lineage leukemia 5 (trithorax homolog, <i>Drosophila</i>)	NM_182931
MNS1	Meiosis-specific nuclear structural protein 1	NM_018365
MOBKL2A	MOB1, Mps One Binder kinase activator-like 2A (yeast)	AK024373
MOGAT3	Monoacylglycerol O-acyltransferase 3	NM_178176
MPEG1	Macrophage expressed gene 1	AK074166
MPP1	Membrane protein, palmitoylated 1, 55kDa	NM_002436
MPP2	Membrane protein, palmitoylated 2 (MAGUK p55 subfamily member 2)	NM_005374
MPPE1	Metallophosphoesterase 1	NM_138608
MPZ	Myelin protein zero (Charcot-Marie-Tooth neuropathy 1B)	NM_000530
MRC1	Mannose receptor, C type 1	NM_002438
MRCL3	Myosin regulatory light chain MRCL3	NM_006471
MRPL43	Mitochondrial ribosomal protein L43	NM_176794
MRPL46	Mitochondrial ribosomal protein L46	NM_022163
MS4A6A	Membrane-spanning 4-domains, subfamily A, member 6A	NM_022349
MSN	Moesin	NM_002444
MT	Malonyl-CoA:acyl carrier protein transacylase, mitochondrial	NM_014507
MT1A	Metallothionein 1A (functional)	NM_005946
MT1E	Metallothionein 1E (functional)	NM_175617
MT1H	Metallothionein 1H	NM_005951
MT1J	Metallothionein 1J	NM_175622
MT1K	Metallothionein 1K	NM_176870
MT1L	Metallothionein 1L	X97261
MT1X	Metallothionein 1X	BC032338
MT1X	Metallothionein 1X	NM_005952
MT1X	Metallothionein 1X	NM_005952
MT2A	Metallothionein 2A	BC007034
MT2A	Metallothionein 2A	NM_005953
MT2A	Metallothionein 2A	NM_005953
MTCBP-1	Membrane-type 1 matrix metalloproteinase cytoplasmic tail binding protein-1	NM_018269
MTCH2	Mitochondrial carrier homolog 2 (<i>C. elegans</i>)	NM_014342
MTRFIL	Mitochondrial translational release factor 1-like	NM_019041
MUC20	Mucin 20	NM_152673
MUC3A	Mucin 3A, intestinal	M55405
MX1	Myxovirus (influenza virus) resistance 1, interferon-inducible protein p78 (mouse)	NM_002462
MYO1B	Myosin IB	NM_012223
MYOC	Myocilin, trabecular meshwork inducible glucocorticoid response	NM_000261
NAP1L4	Nucleosome assembly protein 1-like 4	NM_005969
NCKAP1	NCK-associated protein 1	NM_205842
NFE2L3	Nuclear factor (erythroid-derived 2)-like 3	NM_004289
NFYC	Nuclear transcription factor Y, gamma	NM_014223
NICN1	Nicolin 1	NM_032316
NINJ1	Ninjurin 1	NM_004148
NIPSNAP3B	Nipsnap homolog 3B (<i>C. elegans</i>)	NM_018376
NISCH	Nischarin	NM_007184
NNMT	Nicotinamide N-methyltransferase	NM_006169
NOL6	Nucleolar protein family 6 (RNA-associated)	NM_130793
NOSIP	Nitric oxide synthase interacting protein	NM_015953
NPTX1	Neuronal pentraxin 1	NM_002522

NUDT2	Nudix (nucleoside diphosphate linked moiety X)-type motif 2	NM_001161
NUP62	Nucleoporin 62kDa	NM_172374
NXPH4	Neurexophilin 4	NM_007224
NYREN18	NEDD8 ultimate buster-1	BC034716
OAS3	2'-5'-oligoadenylate synthetase 3, 100kDa	NM_006187
OAS3	2'-5'-oligoadenylate synthetase 3, 100kDa	NM_006187
OCA2	Oculocutaneous albinism II (pink-eye dilution homolog, mouse)	NM_000275
OGDHL	Oxoglutarate dehydrogenase-like	NM_018245
OPLAH	5-oxoprolinase(ATP-hydrolysing)	NM_017570
OPRK1	Opioid receptor, kappa 1	NM_000912
OPTN	Optineurin	NM_021980
OSR2	Odd-skipped related 2 (Drosophila)	NM_053001
OSTbeta	Organic solute transporter beta	NM_178859
P8	P8 protein (candidate of metastasis 1)	NM_012385
PAG	Phosphoprotein associated with glycosphingolipid-enriched microdomains	NM_018440
PAM	Peptidylglycine alpha-amidating monooxygenase	NM_000919
PAX8	Paired box gene 8	AK056052
PBXIP1	Pre-B-cell leukemia transcription factor interacting protein 1	NM_020524
PCNT2	Pericentrin 2 (kendrin)	NM_006031
PCOLCE2	Procollagen C-endopeptidase enhancer 2	NM_013363
PDGFC	Platelet derived growth factor C	NM_016205
PDGFRA	Platelet-derived growth factor receptor, alpha polypeptide	NM_006206
PDGFRL	Platelet-derived growth factor receptor-like	NM_006207
PDK4	Pyruvate dehydrogenase kinase, isoenzyme 4	NM_002612
PDZK1	PDZ domain containing 1	NM_002614
PERLD1	Per1-like domain containing 1	NM_033419
PEX19	Peroxisomal biogenesis factor 19	NM_002857
PGM1	Phosphoglucomutase 1	NM_002633
PGRMC1	Progesterone receptor membrane component 1	NM_006667
PHAX	RNA U, small nuclear RNA export adaptor (phosphorylation regulated)	AF086448
PHCA	Phytoceramidase, alkaline	NM_018367
PIP	Prolactin-induced protein	NM_002652
PITPNC1	Phosphatidylinositol transfer protein, cytoplasmic 1	NM_012417
PKM2	Pyruvate kinase, muscle	NM_182471
PKP2	Plakophilin 2	X97675
PLAU	Plasminogen activator, urokinase	NM_002658
PMP22	Peripheral myelin protein 22	NM_000304
PNPLA4	Patatin-like phospholipase domain containing 4	NM_004650
POLD4	Polymerase (DNA-directed), delta 4	NM_021173
POLR2L	Polymerase (RNA) II (DNA directed) polypeptide L, 7.6kDa	NM_021128
POU2F1	POU domain, class 2, transcription factor 1	S66901
PP3856	Similar to CG3714 gene product	NM_145201
PPAP2B	Phosphatidic acid phosphatase type 2B	NM_003713
PPFIA4	Protein tyrosine phosphatase, receptor type, f polypeptide (PTPRF), interacting protein (liprin), alpha 4	NM_015053
PPIC	Peptidylprolyl isomerase C (cyclophilin C)	NM_000943
PPIC	Peptidylprolyl isomerase C (cyclophilin C)	NM_000943
PPIL3	Peptidylprolyl isomerase (cyclophilin)-like 3	NM_131916

PPM1F	Protein phosphatase 1F (PP2C domain containing)	NM_014634
PRAC	Small nuclear protein PRAC	NM_032391
PREB	Prolactin regulatory element binding	BE395450
PRIC285	Peroxisomal proliferator-activated receptor A interacting complex 285	NM_033405
PRKD2	Protein kinase D2	NM_016457
PRKY	Protein kinase, Y-linked	NM_002760
PRSS15	Protease, serine, 15	NM_004793
PSMA5	Proteasome (prosome, macropain) subunit, alpha type, 5	NM_002790
PSMB9	Proteasome (prosome, macropain) subunit, beta type, 9 (large multifunctional protease 2)	NM_148954
PSMD11	Proteasome (prosome, macropain) 26S subunit, non-ATPase, 11	NM_002815
PSORS1C1	Psoriasis susceptibility 1 candidate 1	NM_014068
PSPH	Phosphoserine phosphatase	NM_004577
PSPHL	Phosphoserine phosphatase-like	AJ001612
PTAFR	Platelet-activating factor receptor	S52624
PTGIS	Prostaglandin I2 (prostacyclin) synthase	NM_000961
PTOV1	Prostate tumor overexpressed gene 1	NM_017432
PTP4A3	Protein tyrosine phosphatase type IVA, member 3	NM_007079
PTPRC	Protein tyrosine phosphatase, receptor type, C	NM_080922
PVRL2	Poliovirus receptor-related 2 (herpesvirus entry mediator B)	NM_002856
PXMP2	Peroxisomal membrane protein 2, 22kDa	NM_018663
R30953_1	Interferon inducible GTPase 5	NM_019612
RAB15	RAB15, member RAS oncogene family	NM_198686
RABEP1	Rabaptin, RAB GTPase binding effector protein 1	NM_004703
RAC2	Ras-related C3 botulinum toxin substrate 2 (rho family, small GTP binding protein Rac2)	NM_002872
RAC2	Ras-related C3 botulinum toxin substrate 2 (rho family, small GTP binding protein Rac2)	NM_002872
RAD51AP1	RAD51 associated protein 1	NM_006479
RAI16	Retinoic acid induced 16	NM_022749
RAPH1	Ras association (RalGDS/AF-6) and pleckstrin homology domains 1	NM_213589
RECK	Reversion-inducing-cysteine-rich protein with kazal motifs	NM_021111
RGL2	Ral guanine nucleotide dissociation stimulator-like 2	NM_004761
RGS10	Regulator of G-protein signalling 10	NM_001005339
RGS11	Regulator of G-protein signalling 11	BC040504
RGS16	Regulator of G-protein signalling 16	NM_002928
RGS5	Regulator of G-protein signalling 5	NM_003617
RHBDF1	Rhombooid family 1 (Drosophila)	NM_022450
RHOT2	Ras homolog gene family, member T2	NM_138769
RIMS3	Regulating synaptic membrane exocytosis 3	NM_014747
RIP	RPA interacting protein	NM_032308
RIPK2	Receptor-interacting serine-threonine kinase 2	NM_003821
RLN3	Relaxin 3	NM_080864
RNASE4	Angiogenin, ribonuclease, RNase A family, 5	NM_001145
RNASE4	Angiogenin, ribonuclease, RNase A family, 5	NM_194431
RNF121	Ring finger protein 121	AK023139
RNF125	Ring finger protein 125	NM_017831
RNF13	Ring finger protein 13	NM_007282
RNF138P1	Ring finger protein 138 pseudogene 1	AW975013

RNF146	Ring finger protein 146	NM_030963
RNF19	Ring finger protein 19	NM_183419
ROBO1	Roundabout, axon guidance receptor, homolog 1 (Drosophila)	NM_002941
ROBO3	Roundabout, axon guidance receptor, homolog 3 (Drosophila)	NM_022370
RPL10A	Ribosomal protein L10a	NM_007104
RPL41	Ribosomal protein L41	NM_021104
RPL7A	Ribosomal protein L7a	NM_000972
RPS10	Ribosomal protein S10	NM_001014
RPS16	Ribosomal protein S16	NM_001020
RPS18	Ribosomal protein S18	NM_022551
RPS4X	Ribosomal protein S4, X-linked	NM_001007
RPS4Y1	Ribosomal protein S4, Y-linked 1	NM_001008
RPS4Y2	Ribosomal protein S4, Y-linked 2	NM_138963
RRAGD	Ras-related GTP binding D	NM_021244
RSAFD1	Radical S-adenosyl methionine and flavodoxin domains 1	NM_018264
RTN4	Reticulon 4	NM_153828
RUTBC3	RUN and TBC1 domain containing 3	NM_015705
S100P	S100 calcium binding protein P	NM_005980
SAMD10	Sterile alpha motif domain containing 10	NM_080621
SARA1	SAR1a gene homolog 1 (S. cerevisiae)	NM_020150
SARA1	SAR1a gene homolog 1 (S. cerevisiae)	NM_020150
SAT	Spermidine/spermine N1-acetyltransferase	NM_002970
SAV1	Salvador homolog 1 (Drosophila)	NM_021818
SCAP	SREBP CLEAVAGE-ACTIVATING PROTEIN	NM_012235
SCGB1D1	Secretoglobin, family 1D, member 1	NM_006552
SCGB2A1	Secretoglobin, family 2A, member 1	NM_002407
SCUBE3	Signal peptide, CUB domain, EGF-like 3	NM_152753
SDK1	Sidekick homolog 1 (chicken)	AF052150
SECP43	TRNA selenocysteine associated protein	NM_017846
SECTM1	Secreted and transmembrane 1	NM_003004
SEMA3B	Sema domain, immunoglobulin domain (Ig), short basic domain, secreted, (semaphorin) 3B	NM_004636
SERPINB2	Serine (or cysteine) proteinase inhibitor, clade B (ovalbumin), member 2	BC012609
SESN1	Sestrin 1	NM_014454
SESN2	Sestrin 2	NM_031459
SF4	Splicing factor 4	NM_172231
SGCA	Sarcoglycan, alpha (50kDa dystrophin-associated glycoprotein)	NM_000023
SH3BGR1	SH3 domain binding glutamic acid-rich protein like	NM_003022
SH3GLB1	SH3-domain GRB2-like endophilin B1	NM_016009
SH3GLB2	SH3-domain GRB2-like endophilin B2	NM_020145
SH3RF2	SH3 domain containing ring finger 2	NM_152550
ShrmL	Shroom-related protein	NM_020859
SIRPB2	Signal-regulatory protein beta 2	NM_018556
SLAMF9	SLAM family member 9	NM_033438
SLC10A3	Solute carrier family 10 (sodium/bile acid cotransporter family), member 3	NM_019848
SLC12A2	Solute carrier family 12 (sodium/potassium/chloride transporters), member 2	NM_001046
SLC12A9	Solute carrier family 12 (potassium/chloride transporters), member 9	NM_020246

SLC14A1	Solute carrier family 14 (urea transporter), member 1 (Kidd blood group)	L36121
SLC20A1	Solute carrier family 20 (phosphate transporter), member 1	NM_005415
SLC39A14	Solute carrier family 39 (zinc transporter), member 14	BC000068
SLC6A15	Solute carrier family 6 (neurotransmitter transporter), member 15	NM_018057
SLC7A1	Solute carrier family 7 (cationic amino acid transporter, y+ system), member 1	NM_003045
SLC7A7	Solute carrier family 7 (cationic amino acid transporter, y+ system), member 7	NM_003982
SLC9A3R2	Solute carrier family 9 (sodium/hydrogen exchanger), isoform 3 regulator 2	NM_004785
SLC9A9	Solute carrier family 9 (sodium/hydrogen exchanger), isoform 9	NM_173653
SLCO2B1	Solute carrier organic anion transporter family, member 2B1	NM_007256
SLPI	Secretory leukocyte protease inhibitor (antileukoproteinase)	NM_003064
SLPI	Secretory leukocyte protease inhibitor (antileukoproteinase)	NM_003064
SMAD1	SMAD, mothers against DPP homolog 1 (Drosophila)	NM_005900
SMAP1	Stromal membrane-associated protein 1	NM_021940
SMARCA4	SWI/SNF related, matrix associated, actin dependent regulator of chromatin, subfamily a, member 4	NM_003072
SMARCE1	SWI/SNF related, matrix associated, actin dependent regulator of chromatin, subfamily e, member 1	NM_003079
SMC5L1	SMC5 structural maintenance of chromosomes 5-like 1 (yeast)	NM_015110
SMN2	Survival of motor neuron 1, telomeric	NM_022877
SMP1	NPD014 protein	NM_014313
SMTN	Smoothelin	NM_134269
SNTG2	Syntrophin, gamma 2	NM_018968
SNX7	Sorting nexin 7	NM_015976
SOCSS5	Suppressor of cytokine signaling 5	NM_014011
SORD	Sorbitol dehydrogenase	NM_003104
SP1	Sp1 transcription factor	NM_138473
SPARC	Secreted protein, acidic, cysteine-rich (osteonectin)	NM_003118
SRD5A2L	Steroid 5 alpha-reductase 2-like	NM_024592
SRGAP3	SLIT-ROBO Rho GTPase activating protein 3	AF086321
SRPK2	SFRS protein kinase 2	NM_182691
SSB3	SPRY domain-containing SOCS box protein SSB-3	NM_080861
SSPN	Sarcospan (Kras oncogene-associated gene)	NM_005086
STAT6	Signal transducer and activator of transcription 6, interleukin-4 induced	NM_003153
STX7	Syntaxin 7	NM_003569
SULF1	Sulfatase 1	NM_015170
SUMF1	Sulfatase modifying factor 1	NM_182760
SYAP1	Synapse associated protein 1, SAP47 homolog (Drosophila)	NM_032796
SYMPK	Symplekin	NM_004819
SYNGR2	Synaptogyrin 2	NM_004710

SYT6	Synaptotagmin VI	NM_205848
TAP1	Transporter 1, ATP-binding cassette, sub-family B (MDR/TAP)	NM_000593
TAS2R10	Taste receptor, type 2, member 10	NM_023921
TCTEL1	T-complex-associated-testis-expressed 1-like 1	NM_006519
TDE2	Tumor differentially expressed 2	NM_020755
TETRAN	Tetracycline transporter-like protein	NM_001120
TFAP2B	Transcription factor AP-2 beta (activating enhancer binding protein 2 beta)	NM_003221
TFCP2L3	Transcription factor CP2-like 3	NM_024915
TGFB1I1	Transforming growth factor beta 1 induced transcript 1	NM_015927
TGFBR2	Transforming growth factor, beta receptor II (70/80kDa)	NM_003242
TGM4	Transglutaminase 4 (prostate)	U79008
THSD2	Thrombospondin, type I, domain containing 2	NM_032784
TIFA	TRAF-interacting protein with a forkhead-associated domain	NM_052864
TIMP1	Tissue inhibitor of metalloproteinase 1 (erythroid potentiating activity, collagenase inhibitor)	NM_003254
TLR1	Toll-like receptor 1	NM_003263
TM4SF3	Transmembrane 4 superfamily member 3	NM_004616
TM9SF4	Transmembrane 9 superfamily protein member 4	NM_014742
TMEM25	Transmembrane protein 25	NM_032780
TMEM34	Transmembrane protein 34	NM_018241
TMOD3	Tropomodulin 3 (ubiquitous)	NM_014547
Tmp21-II	Tmp21-II, transcribed pseudogene	AJ004914
TNA	Tetranectin (plasminogen binding protein)	NM_003278
TNFRSF12A	Tumor necrosis factor receptor superfamily, member 12A	NM_016639
TNFRSF18	Tumor necrosis factor receptor superfamily, member 18	NM_148902
TNFSF4	Tumor necrosis factor (ligand) superfamily, member 4 (tax-transcriptionally activated glycoprotein 1, 34kDa)	NM_003326
TNKS2	Tankyrase, TRF1-interacting ankyrin-related ADP-ribose polymerase 2	NM_025235
TPRA40	Seven transmembrane domain orphan receptor	NM_016372
TRAD	Serine/threonine kinase with Dbl- and pleckstrin homology domains	AL137629
TRAF3IP1	TNF receptor-associated factor 3 interacting protein 1	BC059174
TREM4	Triggering receptor expressed on myeloid cells 4	NM_145273
TRIM35	Tripartite motif-containing 35	NM_015066
TRIM9	Tripartite motif-containing 9	NM_015163
TRIP	TRAF interacting protein	NM_005879
TRPM5	Transient receptor potential cation channel, subfamily M, member 5	NM_014555
TRPM7	Transient receptor potential cation channel, subfamily M, member 7	NM_017672
TTC19	Tetratricopeptide repeat domain 19	BC066344
TTR	Transthyretin (prealbumin, amyloidosis type I)	NM_000371
TTYH2	Tweety homolog 2 (Drosophila)	NM_032646
TUBA1	Tubulin, alpha 1 (testis specific)	NM_006000
TUBB1	Tubulin, beta 1	NM_030773
TUBB4	Tubulin, beta 4	NM_006087
TXNIP	Thioredoxin interacting protein	NM_006472
UBD	Ubiquitin D	NM_006398

UBE2V1	Ubiquitin-conjugating enzyme E2 variant 1	NM_199144
UBE3A	Ubiquitin protein ligase E3A (human papilloma virus E6-associated protein, Angelman syndrome)	AF037219
UBL3	Ubiquitin-like 3	NM_007106
UHSKerB	Keratin, ultrahigh sulfur, B	NM_021046
ULK2	Unc-51-like kinase 2 (C. elegans)	NM_014683
URB	Steroid sensitive gene 1	NM_199511
USP54	Ubiquitin specific protease 54	NM_152586
UST	Uronyl-2-sulfotransferase	NM_005715
UTRN	Utrophin (homologous to dystrophin)	AK023675
UTX	Ubiquitously transcribed tetratricopeptide repeat, X chromosome	NM_021140
VAR2L	Valyl-tRNA synthetase 2-like	NM_020442
VAV1	Vav 1 oncogene	NM_005428
VGLL4	Vestigial like 4 (Drosophila)	BQ013066
VNIR1	Vomerolateral 1 receptor 1	NM_020633
VSIG4	V-set and immunoglobulin domain containing 4	NM_007268
WDR22	WD repeat domain 22	NM_003861
WIF1	WNT inhibitory factor 1	NM_007191
WWOX	WW domain containing oxidoreductase	AK094336
XG	Xg blood group (pseudautosomal boundary-divided on the X chromosome)	NM_175569
XIST	X (inactive)-specific transcript	AK025198
XYLT2	Xylosyltransferase II	NM_022167
YPEL5	Yippee-like 5 (Drosophila)	NM_016061
ZBTB7	Zinc finger and BTB domain containing 7	NM_015898
ZFH1B	Zinc finger homeobox 1b	NM_014795
ZFYVE26	Zinc finger, FYVE domain containing 26	NM_015346
ZNF516	Zinc finger protein 516	D86975
ZNF552	Zinc finger protein 552	AK023769
ZNF572	Zinc finger protein 572	NM_152412
ZP3	Zona pellucida glycoprotein 3 (sperm receptor)	NM_007155
ZSCAN2	Zinc finger and SCAN domain containing 2	NM_017894
	No Annotation	A_23_BS113762
	No Annotation	A_24_BS784213
	No Annotation	A_24_BS926155
	No Annotation	A_24_BS927614
	No Annotation	A_24_BS934268
	No Annotation	A_32_BS169243
	No Annotation	A_32_BS200773
	No Annotation	A_32_BS53976
	No Annotation	A_32_BS73184
	No Annotation	A_32_BS74588
	No Annotation	AB065507
	No Annotation	AC007051
	No Annotation	AC007066
	No Annotation	AC008453
	No Annotation	AC025463
	No Annotation	AC060234
	No Annotation	AC087071
	No Annotation	AC096677
	Full length insert cDNA clone ZB81F12	AF086167
	No Annotation	AF089746
	Amyloid lambda 6 light chain variable region SAR	AF121762

	IMAGE Consortium ID 839832, mRNA sequence	AF124368
	Clone FLB4246 PRO1102 mRNA, complete cds	AF130105
	HSPC101	AF161364
	LOC440135	AF318337
	No Annotation	AF372624
	No Annotation	AF533936
	MRNA (fetal brain cDNA g6_1g)	AI791206
	Hypothetical protein (ORF1), clone 00275	AJ276555
	No Annotation	AK001565
	Hypothetical LOC388796	AK022745
	Homo sapiens, clone IMAGE:4401608, mRNA	AK022793
	Homo sapiens, clone IMAGE:4214313, mRNA	AK022893
	Homo sapiens, clone IMAGE:5277945, mRNA	AK022997
	CDNA: FLJ22769 fis, clone KAIA1316	AK026422
	CDNA FLJ31059 fis, clone HSYRA2000832	AK055621
	CDNA FLJ32177 fis, clone PLACE6001294	AK056856
	Homo sapiens, clone IMAGE:5575764, mRNA	AK090500
	Homo sapiens, clone IMAGE:5575764, mRNA	AK092921
	CDNA FLJ36725 fis, clone UTERU2012230	AK094044
	CDNA FLJ38235 fis, clone FCBBF2005428	AK095554
	CDNA FLJ25794 fis, clone TST07014	AK098660
	No Annotation	AL009178
	MRNA; cDNA DKFZp566L0824 (from clone DKFZp566L0824)	AL050042
	No Annotation	AL109935
	No Annotation	AL132874
	Full-length cDNA clone CS0DJ001YJ05 of T cells (Jurkat cell line) Cot 10-normalized of Homo sapiens (human)	AL137761
	No Annotation	AL391244
	No Annotation	AL445486
	No Annotation	AL591806
	No Annotation	AL731541
	No Annotation	AL928970
	No Annotation	AY062331
	No Annotation	AY372690
	No Annotation	BC009051
	LOC441164	BC009220
	CDNA clone IMAGE:3462401, partial cds	BC010544
	No Annotation	BC011367
	No Annotation	BC015531
	LOC440441	BC020847
	Homo sapiens, clone IMAGE:5295565, mRNA, partial cds	BC031278
	Similar to jumonji domain containing 1A; testis-specific protein A; zinc finger protein	BC035102
	Homo sapiens, clone IMAGE:5575764, mRNA	BC035647
	Hypothetical LOC197387	BC038761
	Hypothetical gene supported by BC039664	BC039664
	No Annotation	BC107852
	No Annotation	BG252130
	Full-length cDNA clone CS0DI009YA14 of Placenta Cot 25-normalized of Homo sapiens (human)	BG327427
	Hypothetical LOC339352	BG620990

	Similar to PI-3-kinase-related kinase SMG-1 isoform 2; lambda/iota protein kinase C-interacting protein; phosphatidylinositol 3-kinase-related protein kinase	BI014689
	Similar to D(1B) dopamine receptor (D(5) dopamine receptor) (D1beta dopamine receptor)	BM561346
	No Annotation	BM839360
	Transcribed locus	BM925639
	No Annotation	BM928667
	Transcribed locus	BQ049338
	No Annotation	BQ346290
	Homo sapiens, clone IMAGE:4838137, mRNA	BU587941
	LOC441139	BX118328
	No Annotation	D80006
	No Annotation	DQ101103
	No Annotation	DQ188807
	No Annotation	ENST00000242479
	No Annotation	ENST00000246627
	No Annotation	ENST00000259219
	No Annotation	ENST00000259550
	No Annotation	ENST00000293569
	No Annotation	ENST00000296448
	No Annotation	ENST00000298643
	No Annotation	ENST00000299756
	No Annotation	ENST00000300068
	No Annotation	ENST00000305402
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	No Annotation	ENST00000307901
	No Annotation	ENST00000308307
	No Annotation	ENST00000310210
	No Annotation	ENST00000312401
	No Annotation	ENST00000312412
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	No Annotation	ENST00000322114
	No Annotation	ENST00000322404
	No Annotation	ENST00000322803
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	No Annotation	ENST00000325204
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	No Annotation	ENST00000328708
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	No Annotation	ENST00000329491
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	No Annotation	ENST00000330875
	No Annotation	ENST00000331096
	No Annotation	ENST00000331577
	No Annotation	ENST00000331640
	No Annotation	ENST00000332271
	No Annotation	ENST00000332944

	No Annotation	ENST00000332989
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	No Annotation	ENST00000333784
	Transcribed locus, weakly similar to NP_808455.1 hypothetical protein 9830102E05 [Mus musculus]	H16080
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	No Annotation	I_1100650
	No Annotation	I_1221777
	No Annotation	I_1861543
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	No Annotation	I_1882608
	No Annotation	I_1891291
	No Annotation	I_1893151
	No Annotation	I_1980505
	No Annotation	I_1985061
	No Annotation	I_3335767
	No Annotation	I_3344109
	No Annotation	I_3551568
	No Annotation	I_3575384
	No Annotation	I_3576071
	No Annotation	I_3580313
	No Annotation	I_3588329
	No Annotation	I_930906
	No Annotation	I_932413
	No Annotation	I_943866
	No Annotation	I_944092
	No Annotation	I_962800
	No Annotation	I_964340
	No Annotation	I_966091
	No Annotation	I_966691
	No Annotation	M15073
	No Annotation	M64260
	No Annotation	NG_001019
	No Annotation	NM_001005360
	No Annotation	NM_001008528
	No Annotation	NM_001009555
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	No Annotation	NM_001011708
	No Annotation	NM_001013632
	No Annotation	NM_001013680
	No Annotation	NM_001014975
	No Annotation	NM_001018006
	No Annotation	NM_001018011
	No Annotation	NM_001018076
	No Annotation	NM_001024227
	No Annotation	NM_001024465
	No Annotation	NM_001024808
	No Annotation	NM_001025077
	No Annotation	NM_001025201
	No Annotation	NM_001031677
	No Annotation	NM_001033044
	No Annotation	NM_001033569
	No Annotation	NM_003671
	No Annotation	NM_014758
	No Annotation	NM_015262

	No Annotation	NM_018350
	No Annotation	NM_018506
	No Annotation	NM_080432
	No Annotation	NM_138411
	No Annotation	NM_153030
	No Annotation	NM_153237
	No Annotation	NM_172020
	No Annotation	NM_173705
	No Annotation	NM_173709
	No Annotation	NM_178429
	No Annotation	NM_178467
	No Annotation	NM_213595
	No Annotation	NR_001544
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	Anti-HIV-1 gp120 V3 loop antibody DO142-10 light chain variable region	S62210
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	No Annotation	THC1409898
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	No Annotation	THC1434038
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	No Annotation	THC1457058
	No Annotation	THC1457118
	No Annotation	THC1459712
	No Annotation	THC1461073
	No Annotation	THC1469536
	No Annotation	THC1475763
	No Annotation	THC1477639
	No Annotation	THC1484458
	No Annotation	THC1490378
	No Annotation	THC1493219
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	No Annotation	THC1505917
	No Annotation	THC1506312
	No Annotation	THC1511927
	No Annotation	THC1515028
	No Annotation	THC1525318
	No Annotation	THC1531579
	No Annotation	THC1537124
	No Annotation	THC1543691
	No Annotation	THC1544941
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	No Annotation	THC1555359
	No Annotation	THC1559236
	No Annotation	THC1560798
	No Annotation	THC1562602
	No Annotation	THC1563147
	No Annotation	THC1564329
	No Annotation	THC1572906
	No Annotation	THC1572972
	No Annotation	THC1574967
	No Annotation	THC1578318
	No Annotation	THC1581022

	No Annotation	THC1584122
	No Annotation	THC1589164
	No Annotation	THC1591470
	Hypothetical gene LOC133874	U31733
	No Annotation	U62539
	No Annotation	X68990
	No Annotation	XM_065006
	No Annotation	XM_165930
	No Annotation	XM_170211
	Similar to ARHQ protein	XM_209429
	No Annotation	XM_210579
	No Annotation	XM_291496
	No Annotation	XM_291718
	No Annotation	XM_295760
	No Annotation	XM_301448
	No Annotation	XM_303638
	No Annotation	XM_305652
	Similar to Tubulin beta-4q chain	XM_371684
	Similar to CXYorf1-related protein	XM_377073
	Similar to immunoglobulin M chain	Y11328

Example 3: Use of Linear Discriminant Analysis (LDA) to Distinguish the *Diffuse-Proliferation* and *Inflammatory* Groups.

Genes that distinguished samples in the *Diffuse-Proliferation* and *Inflammatory* groups were selected using Linear Discriminant Analysis (LDA), described in Example 2, and the initial skin biopsy gene expression datasets. Examination of the expression data for single genes shows that the expression any one single gene may not always clearly distinguish between the groups of proliferation and no proliferation. In contrast, the multivariable LDA analysis results in LDA scores that separated the two groups more than by using the gene expression of single genes alone. Particularly in the case of testing the results of the LDA equation for the *Inflammatory* group in a separate dataset, the multivariate analysis resulted in clear separation of the two groups. This analysis therefore provides potential biomarkers in the skin for identifying the intrinsic subsets in SSc in new skin biopsies.

For the *Diffuse-Proliferation* group, LDA Score = $-1.902(\text{NM}_004703) - 1.908(\text{NM}_020422) + 1.475(\text{AGI_HUM1_OLIGO_A_24_P690235}) + 1.83(\text{NM}_173511)$, where NM_004703 corresponds to RABEP1, NM_020422 corresponds to promethin, AGI_HUM1_OLIGO_A_24_P690235 refers to novel gene transcript ENST00000312412, and NM_173511 refers to ALS2CR13.

For the *Inflammatory* group, LDA score = $4.365(\text{NM}_002119) + 2.926(\text{NM}_006851) - 2.620(\text{NM}_017570) + 6.601(\text{NM}_022163) + 2.033(\text{NM}_012110)$, where NM_002119 refers to HLA-DOA, NM_006851 refers to GLIPR1, NM_017570 refers to OPLAH,

NM_022163 refers to MRPL46, and NM_012110 refers to CHIC2.

Example 4: IL-13 and IL-4 Gene Signatures Identify the *Inflammatory* Subset.

In addition to TGF β , gene expression signatures associated with pro-fibrotic cytokines IL-13 (NM_002188) and IL-4 (NM_000589) were determined in cultured adult human dermal fibroblasts. The 490 genes of the IL-13 gene signature are presented in Table 4. The genes of the IL-4 gene signature are presented in Table 5. This analysis indicated that IL-13 and IL-4 share an approximately 60% overlap of inducible genes. In contrast, the TGF β inducible signature was composed of a distinct set of gene expression targets demonstrating a 5% overlap with the IL-13 and IL-4 signatures.

Gene expression signatures were used to determine the potential drivers of fibrosis in a large well-controlled gene expression dataset of SSc skin biopsies, which were demonstrated herein as molecular subsets in scleroderma skin. The TGF β signature was largely expressed in a subset of diffuse patients and was more highly expressed in patients with more severe skin disease ($p < 0.01$) and scleroderma lung disease ($p < 0.01$). The IL-13 and IL-4 gene expression signatures showed increased expression in the *Inflammatory* subset of SSc patients biopsies, and represent the earliest disease stages.

It is contemplated that fibrosis in different SSc subsets is driven by different molecular mechanisms tied to either TGF β or IL-13 and IL-4. These finding indicate that patient subsetting is necessary in order to target different anti-fibrotic treatments based on molecular subclassifications of SSc patients.

TABLE 4

Gene Symbol	Gene Name	Accession No.
ABCA6	ATP-binding cassette, sub-family A (ABC1), member 6	NM_080284
ACTA1	Actin, alpha 1, skeletal muscle	NM_001100
ADAMTS1	A disintegrin-like and metalloprotease (repolysin type) with thrombospondin type 1 motif, 1	NM_006988
ADCY4	Adenylate cyclase 4	NM_139247
ADH1A	Alcohol dehydrogenase 1A (class I), alpha polypeptide	NM_000667
ADRA2C	Adrenergic, alpha-2C-, receptor	NM_000683
AHR	Aryl hydrocarbon receptor	NM_001621
AKAP12	A kinase (PRKA) anchor protein (gravin) 12	NM_144497
AMPH	Amphiphysin (Stiff-Man syndrome with breast cancer 128kDa autoantigen)	NM_001635
ANGPTL4	Angiopoietin-like 4	NM_139314
ANK1	Ankyrin 1, erythrocytic	NM_020478
ANLN	Anillin, actin binding protein (scraps homolog, Drosophila)	NM_018685
ANXA3	Annexin A3	NM_005139
APCDD1	Adenomatosis polyposis coli down-regulated 1	NM_153000
APOD	Apolipoprotein D	NM_001647

APOH	Apolipoprotein H (beta-2-glycoprotein I)	NM_000042
ARHGAP18	Rho GTPase activating protein 18	NM_033515
ARHGDIB	Rho GDP dissociation inhibitor (GDI) beta	NM_001175
ARNT2	Aryl-hydrocarbon receptor nuclear translocator 2	NM_014862
ARRDC4	Arrestin domain containing 4	NM_183376
ASB9	Ankyrin repeat and SOCS box-containing 9	NM_024087
ASCL2	Achaete-scute complex-like 2 (Drosophila)	NM_005170
ASPA	Aspartoacylase (aminoacylase 2, Canavan disease)	NM_000049
ASPM	Asp (abnormal spindle)-like, microcephaly associated (Drosophila)	NM_018136
ASPM	Asp (abnormal spindle)-like, microcephaly associated (Drosophila)	NM_018136
ATF3	Activating transcription factor 3	NM_004024
ATF7IP2	Activating transcription factor 7 interacting protein 2	CR626222
BCL11A	B-cell CLL/lymphoma 11A (zinc finger protein)	BU540282
BDKRB1	Bradykinin receptor B1	NM_000710
BDKRB1	Bradykinin receptor B1	NM_000710
BDKRB2	Bradykinin receptor B2	NM_000623
BIRC5	Baculoviral IAP repeat-containing 5 (survivin)	BC007606
BNC1	Basonuclin 1	NM_001717
BNC2	Basonuclin 2	BC020879
BNC2	Basonuclin 2	NM_017637
BNC2	Basonuclin 2	NM_017637
BSPRY	B-box and SPRY domain containing	NM_017688
BUB1	BUB1 budding uninhibited by benzimidazoles 1 homolog (yeast)	NM_004336
C10orf10	Chromosome 10 open reading frame 10	NM_007021
C10orf3	Chromosome 10 open reading frame 3	NM_018131
C10orf72	Chromosome 10 open reading frame 72	AK001062
C13orf3	Chromosome 13 open reading frame 3	BC013418
C18orf11	Chromosome 18 open reading frame 11	NM_022751
C18orf11	Chromosome 18 open reading frame 11	NM_022751
C18orf4	Chromosome 18 open reading frame 4	NM_032160
C20orf129	Chromosome 20 open reading frame 129	NM_030919
C21orf81	Chromosome 21 open reading frame 81	NM_153750
C4BPA	Complement component 4 binding protein, alpha	NM_000715
C5orf13	Chromosome 5 open reading frame 13	NM_004772
C5orf4	Chromosome 5 open reading frame 4	NM_032385
C8orf22	Chromosome 8 open reading frame 22	NM_001007176
C9orf58	Chromosome 9 open reading frame 58	NM_001002260
C9orf58	Chromosome 9 open reading frame 58	NM_001002260
CA8	Carbonic anhydrase VIII	NM_004056
CAV1	Caveolin 1, caveolae protein, 22kDa	NM_001753
CAV1	Caveolin 1, caveolae protein, 22kDa	NM_001753
CCL2	Chemokine (C-C motif) ligand 2	NM_002982
CCL26	Chemokine (C-C motif) ligand 26	NM_006072
CCNB1	Cyclin B1	NM_031966
CCNB2	Cyclin B2	NM_004701
CCR1	Chemokine (C-C motif) receptor 1	NM_001295
CCRL1	Chemokine (C-C motif) receptor-like 1	NM_178445
CD200	CD200 antigen	NM_001004196
CD33	CD33 antigen (gp67)	NM_001772
CD38	CD38 antigen (p45)	NM_001775
CD3G	CD3G antigen, gamma polypeptide (TiT3 complex)	NM_000073
CDC2	Cell division cycle 2, G1 to S and G2 to M	NM_001786
CDC20	CDC20 cell division cycle 20 homolog (S. cerevisiae)	NM_001255
CDC25C	Cell division cycle 25C	NM_001790

CDC37L1	Cell division cycle 37 homolog (<i>S. cerevisiae</i>)-like 1	NM_017913
CDCA2	Cell division cycle associated 2	NM_152562
CDCA5	Cell division cycle associated 5	NM_080668
CDCA8	Cell division cycle associated 8	NM_018101
CDH1	Cadherin 1, type 1, E-cadherin (epithelial)	NM_004360
CDH18	Cadherin 18, type 2	NM_004934
CDKN3	Cyclin-dependent kinase inhibitor 3 (CDK2-associated dual specificity phosphatase)	NM_005192
CEACAM1	Carcinoembryonic antigen-related cell adhesion molecule 1 (biliary glycoprotein)	NM_001712
CENPF	Centromere protein F, 350/400ka (mitosin)	NM_016343
CGA	Glycoprotein hormones, alpha polypeptide	NM_000735
CH25H	Cholesterol 25-hydroxylase	NM_003956
CHST6	Carbohydrate (N-acetylglucosamine 6-O) sulfotransferase 6	NM_021615
CISH	Cytokine inducible SH2-containing protein	NM_145071
CITED4	Cbp/p300-interacting transactivator, with Glu/Asp-rich carboxy-terminal domain, 4	NM_133467
CKLFSF8	Chemokine-like factor super family 8	NM_178868
CLDN11	Claudin 11 (oligodendrocyte transmembrane protein)	AF085871
CMKOR1	Chemokine orphan receptor 1	NM_020311
CNIH3	Cornichon homolog 3 (<i>Drosophila</i>)	NM_152495
COL4A6	Collagen, type IV, alpha 6	NM_033641
COL8A2	Collagen, type VIII, alpha 2	NM_005202
CP	Ceruloplasmin (ferroxidase)	NM_000096
CPB2	Carboxypeptidase B2 (plasma, carboxypeptidase U)	NM_001872
CPXM2	Carboxypeptidase X (M14 family), member 2	NM_198148
CTGF	Connective tissue growth factor	NM_001901
CTNNA1	Catenin (cadherin-associated protein), alpha-like 1	NM_003798
CX3CL1	Chemokine (C-X3-C motif) ligand 1	NM_002996
CX3CR1	Chemokine (C-X3-C motif) receptor 1	NM_001337
CXCL1	Chemokine (C-X-C motif) ligand 1 (melanoma growth stimulating activity, alpha)	NM_001511
CXCL14	Chemokine (C-X-C motif) ligand 14	NM_004887
CXCR4	chemokine (C-X-C motif) receptor 4	NM_001008540
CYP2F1	Cytochrome P450, family 2, subfamily F, polypeptide 1	NM_000774
DCAMKL1	Doublecortin and CaM kinase-like 1	NM_004734
DCN	Decorin	BQ004014
DKFZP434B061	DKFZP434B061 protein	AL117481
DKFZP434I216	DKFZP434I216 protein	NM_015432
DKFZp564I1922	Adlican	NM_015419
DKFZP586A0522	DKFZP586A0522 protein	NM_014033
DKFZP586A0522	DKFZP586A0522 protein	NM_014033
DKFZP586K1520	DKFZP586K1520 protein	AL050153
DLG7	Discs, large homolog 7 (<i>Drosophila</i>)	NM_014750
DMD	Dystrophin (muscular dystrophy, Duchenne and Becker types)	NM_004010
DOK1	Docking protein 1, 62kDa (downstream of tyrosine kinase 1)	NM_001381
DRCTNNB1A	Down-regulated by Ctnnb1, a	NM_032581
DUSP6	Dual specificity phosphatase 6	NM_001946
ECHDC3	Enoyl Coenzyme A hydratase domain containing 3	NM_024693
ECM2	Extracellular matrix protein 2, female organ and adipocyte specific	NM_001393
EDN1	Endothelin 1	NM_001955
EFNB2	Ephrin-B2	NM_004093
EGLN3	Egl nine homolog 3 (<i>C. elegans</i>)	NM_022073

EGR1	Early growth response 1	NM_001964
EN1	Engrailed homolog 1	NM_001426
ENC1	Ectodermal-neural cortex (with BTB-like domain)	NM_003633
ENC1	Ectodermal-neural cortex (with BTB-like domain)	NM_003633
EPHA4	EPH receptor A4	NM_004438
EPHX2	Epoxide hydrolase 2, cytoplasmic	NM_001979
EXOSC8	Exosome component 8	NM_181503
EXOSC8	Exosome component 8	NM_181503
FABP1	Fatty acid binding protein 1, liver	NM_001443
FADS1	Fatty acid desaturase 1	NM_013402
FBXO32	F-box protein 32	NM_058229
FCGR2A	Fc fragment of IgG, low affinity IIa, receptor for (CD32)	NM_021642
FGF7	Galactokinase 2	NM_002009
FGF7	Galactokinase 2	NM_002009
FGF7	Galactokinase 2	NM_002009
FHL2	Four and a half LIM domains 2	NM_201555
FKSG14	Leucine zipper protein FKSG14	NM_022145
FLJ10156	Hypothetical protein FLJ10156	NM_019013
FLJ13391	Hypothetical protein FLJ13391	NM_032181
FLJ14712	Hypothetical protein FLJ14712	AK027618
FLJ20255	Hypothetical protein FLJ20255	AK000262
FLJ31340	Hypothetical protein FLJ31340	NM_152748
FLJ35767	FLJ35767 protein	NM_207459
FLJ36031	Hypothetical protein FLJ36031	AK098422
FLJ36031	Hypothetical protein FLJ36031	NM_175884
FLJ37478	Hypothetical protein FLJ37478	NM_178557
FLJ40629	Hypothetical protein FLJ40629	NM_152515
FMN	Formin (limb deformity)	BC029107
FOXQ1	Forkhead box Q1	NM_033260
FZD10	Frizzled homolog 10 (Drosophila)	NM_007197
FZD4	Frizzled homolog 4 (Drosophila)	NM_012193
G2	G2 protein	U10991
GAL	Galanin	NM_015973
GAS1	Growth arrest-specific 1	NM_002048
GATA6	GATA binding protein 6	NM_005257
GDF3	Growth differentiation factor 3	NM_020634
GEM	GTP binding protein overexpressed in skeletal muscle	NM_005261
GLCC11	Glucocorticoid induced transcript 1	NM_138426
GNG11	Guanine nucleotide binding protein (G protein), gamma 11	NM_004126
GPR68	G protein-coupled receptor 68	NM_003485
GREM1	Gremlin 1 homolog, cysteine knot superfamily (Xenopus laevis)	NM_013372
GSG1	Germ cell associated 1	NM_031289
GTSE1	G-2 and S-phase expressed 1	NM_016426
HAS3	Hyaluronan synthase 3	NM_005329
HCAP-G	Chromosome condensation protein G	NM_022346
HES1	Hairy and enhancer of split 1, (Drosophila)	NM_005524
HIST1H4B	Histone 1, H4b	NM_003544
HIST1H4C	Histone 1, H4c	NM_003542
HIST1H4L	Histone 1, H4l	NM_003546
HLF	Hepatic leukemia factor	NM_002126
HMMR	Hyaluronan-mediated motility receptor (RHAMM)	NM_012484
HRH1	Histamine receptor H1	NM_000861
HT008	Uncharacterized hypothalamus protein HT008	NM_018469
ICA1	Islet cell autoantigen 1, 69kDa	NM_004968

ICAM5	Intercellular adhesion molecule 5, telencephalin	NM_003259
ID1	Inhibitor of DNA binding 1, dominant negative helix-loop-helix protein	NM_002165
IFI44	Interferon-induced protein 44	NM_006417
IL6	Interleukin 6 (interferon, beta 2)	NM_000600
INSIG2	Insulin induced gene 2	NM_016133
INSIG2	Insulin induced gene 2	NM_016133
IRF5	Interferon regulatory factor 5	NM_002200
JAG1	Jagged 1 (Alagille syndrome)	NM_000214
KCNH2	Potassium voltage-gated channel, subfamily H (eag-related), member 2	NM_000238
KCNMB4	Potassium large conductance calcium-activated channel, subfamily M, beta member 4	NM_014505
KCTD12	Potassium channel tetramerisation domain containing 12	NM_138444
KIAA0101	KIAA0101	NM_014736
KIAA1199	KIAA1199	NM_018689
KIAA1199	KIAA1199	NM_018689
KIAA1217	KIAA1217	AK022045
KIAA1217	KIAA1217	NM_019590
KIAA1509	KIAA1509	AB040942
KIAA1644	KIAA1644 protein	AB051431
KIAA1666	KIAA1666 protein	BC035246
KIAA1913	KIAA1913	BC044246
KIF18A	Kinesin family member 18A	NM_031217
KIF20A	Kinesin family member 20A	NM_005733
KIF2C	Kinesin family member 2C	NM_006845
KIF4A	Kinesin family member 4A	NM_012310
KLF2	Kruppel-like factor 2 (lung)	NM_016270
KLK8	Kallikrein 8 (neuropsin/ovasin)	NM_144505
KLRC1	Killer cell lectin-like receptor subfamily C, member 1	NM_002259
KNTC2	Kinetochore associated 2	NM_006101
KRT23	Keratin 23 (histone deacetylase inducible)	NM_015515
KRTAP1-5	Keratin associated protein 1-5	NM_031957
LADI	Ladinin 1	NM_005558
LAMA2	Laminin, alpha 2 (merosin, congenital muscular dystrophy)	NM_000426
LEF1	Lymphoid enhancer-binding factor 1	NM_016269
LHX2	LIM homeobox 2	NM_004789
LIPE	Lipase, hormone-sensitive	NM_005357
LMNB1	Lamin B1	NM_005573
LOC126755	Hypothetical protein LOC126755	CR622769
LOC150166	Hypothetical protein LOC150166	AK056836
LOC150271	Hypothetical LOC388889	AK098753
LOC199964	Hypothetical protein LOC199964	NM_182532
LOC222171	Hypothetical protein LOC222171	NM_175887
LOC255480	Hypothetical protein LOC255480	AK091766
LOC284018	Hypothetical protein LOC284018	NM_181655
LOC285733	Hypothetical protein LOC285733	AK091900
LOC286254	Hypothetical protein LOC286254	AK092751
LOC51334	Mesenchymal stem cell protein DSC54	NM_016644
LOXL3	Lysyl oxidase-like 3	NM_032603
LOXL3	Lysyl oxidase-like 3	NM_032603
LPXN	Leupaxin	NM_004811
LRP8	Low density lipoprotein receptor-related protein 8, apolipoprotein e receptor	NM_033300
LYZ	Lysozyme (renal amyloidosis)	NM_000239

LZTS1	Leucine zipper, putative tumor suppressor 1	NM_021020
MAD2L1	MAD2 mitotic arrest deficient-like 1 (yeast)	NM_002358
MAFB	V-maf musculoaponeurotic fibrosarcoma oncogene homolog B (avian)	NM_005461
MAGEA1	Melanoma antigen, family A, 1 (directs expression of antigen MZ2-E)	NM_004988
MAL2	Mal, T-cell differentiation protein 2	NM_052886
MAOB	Monoamine oxidase B	NM_000898
MAP3K8	Mitogen-activated protein kinase kinase kinase 8	NM_005204
MARLIN1	Multiple coiled-coil GABABR1-binding protein	NM_144720
MEST	Mesoderm specific transcript homolog (mouse)	NM_002402
MGAT3	Mannosyl (beta-1,4-)-glycoprotein beta-1,4-N-acetylglucosaminyltransferase	AK125361
MGC13040	Hypothetical protein MGC13040	NM_032930
MGC22265	Hypothetical protein MGC22265	BC048193
MGC2574	Hypothetical protein MGC2574	NM_024098
MGC2574	Hypothetical protein MGC2574	NM_024098
MGC33365	Hypothetical protein MGC33365	NM_173552
MLANA	Melan-A	NM_005511
MMP12	Matrix metalloproteinase 12 (macrophage elastase)	NM_002426
MSX1	Msh homeo box homolog 1 (Drosophila)	NM_002448
MT1B	Metallothionein 1B (functional)	NM_005947
MT1E	Metallothionein 1E (functional)	NM_175617
MT1G	Metallothionein 1G	NM_005950
MT1K	Metallothionein 1K	NM_176870
MT1L	Metallothionein 1L	X97261
MT1X	Metallothionein 1X	NM_005952
MT2A	Metallothionein 2A	NM_005953
MT2A	Metallothionein 2A	NM_005953
MTL5	Metallothionein-like 5, testis-specific (tesmin)	NM_004923
MYCN	V-myc myelocytomatosis viral related oncogene, neuroblastoma derived (avian)	NM_005378
MYO10	Myosin X	NM_012334
MYO10	Myosin X	NM_012334
MYO5B	Myosin VB	AK025336
MYO5C	Myosin VC	NM_018728
MYRIP	Myosin VIIA and Rab interacting protein	NM_015460
NAV2	Neuron navigator 2	NM_182964
NET1	Neuroepithelial cell transforming gene 1	NM_005863
NETO2	Neuropilin (NRP) and tolloid (TLL)-like 2	NM_018092
NFE2	Nuclear factor (erythroid-derived 2), 45kDa	NM_006163
NFIL3	Nuclear factor, interleukin 3 regulated	NM_005384
NGEF	Neuronal guanine nucleotide exchange factor	NM_019850
NID2	Nidogen 2 (osteonidogen)	NM_007361
NOSTRIN	Nitric oxide synthase trafficker	NM_052946
NOV	Nephroblastoma overexpressed gene	NM_002514
NR0B1	Nuclear receptor subfamily 0, group B, member 1	NM_000475
NR0B2	Nuclear receptor subfamily 0, group B, member 2	NM_021969
NSE1	NSE1	NM_145175
NTN4	Netrin 4	NM_021229
NTS	Neurotensin	NM_006183
ODZ3	Odz, odd Oz/ten-m homolog 3 (Drosophila)	AB040888
ODZ3	Odz, odd Oz/ten-m homolog 3 (Drosophila)	AB040888
OIP5	Opa-interacting protein 5	NM_007280
OLFML2A	Olfactomedin-like 2A	NM_182487
OR7E140P	Olfactory receptor, family 7, subfamily E, member 140 pseudogene	BC073935

OVOS2	Ovostatin 2	BC039117
PAG	Phosphoprotein associated with glycosphingolipid-enriched microdomains	NM_018440
PBEF1	Pre-B-cell colony enhancing factor 1	NM_005746
PBEF1	Pre-B-cell colony enhancing factor 1	NM_182790
PCANAP6	Prostate cancer associated protein 6	NM_033102
PCSK5	Proprotein convertase subtilisin/kexin type 5	NM_006200
PDGFA	Platelet-derived growth factor alpha polypeptide	NM_002607
PDGFC	Platelet derived growth factor C	NM_016205
PDGFD	DNA-damage inducible protein 1	NM_025208
PHACTR1	Phosphatase and actin regulator 1	NM_030948
PHLDA1	Pleckstrin homology-like domain, family A, member 1	NM_007350
PHLDA1	Pleckstrin homology-like domain, family A, member 1	NM_007350
PHLDB2	Pleckstrin homology-like domain, family B, member 2	NM_145753
PIK3R1	Phosphoinositide-3-kinase, regulatory subunit 1 (p85 alpha)	NM_181523
PIM1	Pim-1 oncogene	NM_002648
PKD1L2	Polycystic kidney disease 1-like 2	NM_052892
PKD2	Polycystic kidney disease 2 (autosomal dominant)	NM_000297
PLAC8	Placenta-specific 8	NM_016619
PLAC8	Placenta-specific 8	NM_016619
PLD1	Phospholipase D1, phosphatidylcholine-specific	NM_002662
PLK2	Polo-like kinase 2 (Drosophila)	NM_006622
PLP1	Proteolipid protein 1 (Pelizaeus-Merzbacher disease, spastic paraplegia 2, uncomplicated)	M54927
PMAIP1	Phorbol-12-myristate-13-acetate-induced protein 1	NM_021127
PPP1R1A	Protein phosphatase 1, regulatory (inhibitor) subunit 1A	NM_006741
PPP1R3B	Protein phosphatase 1, regulatory (inhibitor) subunit 3B	AK091994
PPP2R3A	Protein phosphatase 2 (formerly 2A), regulatory subunit B", alpha	NM_002718
PRC1	Protein regulator of cytokinesis 1	NM_003981
PREX1	Phosphatidylinositol 3,4,5-trisphosphate-dependent RAC exchanger 1	NM_020820
PRKCB1	Protein kinase C, beta 1	NM_002738
PRKCB1	Protein kinase C, beta 1	NM_002738
PROC	Protein C (inactivator of coagulation factors Va and VIIIa)	NM_000312
PSCDBP	Pleckstrin homology, Sec7 and coiled-coil domains, binding protein	NM_004288
PSD3	Pleckstrin and Sec7 domain containing 3	NM_015310
PSG11	Pregnancy specific beta-1-glycoprotein 11	NM_002785
PSG3	Pregnancy specific beta-1-glycoprotein 3	NM_021016
PTGER4	Prostaglandin E receptor 4 (subtype EP4)	NM_000958
PTGFR	Prostaglandin F receptor (FP)	NM_000959
PTTG1	Pituitary tumor-transforming 1	NM_004219
PTTG2	Pituitary tumor-transforming 2	NM_006607
RAB11FIP2	RAB11 family interacting protein 2 (class I)	NM_014904
RACGAP1	Rac GTPase activating protein 1	NM_013277
RAD52B	RAD52 homolog B (S. cerevisiae)	NM_145654
RAMP1	Receptor (calcitonin) activity modifying protein 1	NM_005855
RANBP9	RAN binding protein 9	NM_005493
RANBP9	RAN binding protein 9	NM_005493
RANBP9	RAN binding protein 9	NM_005493
RASD1	RAS, dexamethasone-induced 1	NM_016084
REV3L	REV3-like, catalytic subunit of DNA polymerase zeta (yeast)	NM_002912
RGS2	Regulator of G-protein signalling 2, 24kDa	NM_002923

RIMS3	Regulating synaptic membrane exocytosis 3	NM_014747
RIPK3	Receptor-interacting serine-threonine kinase 3	NM_006871
RIPK4	Receptor-interacting serine-threonine kinase 4	NM_020639
ROBO3	Roundabout, axon guidance receptor, homolog 3 (Drosophila)	NM_022370
RPESP	RPE-spondin	NM_153225
RRM2	Ribonucleotide reductase M2 polypeptide	NM_001034
RTN4R	Reticulon 4 receptor	NM_023004
SALL2	Sal-like 2 (Drosophila)	NM_005407
SAMSN1	SAM domain, SH3 domain and nuclear localisation signals, 1	NM_022136
SATB1	Special AT-rich sequence binding protein 1 (binds to nuclear matrix/scaffold-associating DNA's)	NM_002971
SCIN	Scinderin	NM_033128
SECTM1	Secreted and transmembrane 1	NM_003004
SEMA6A	Sema domain, transmembrane domain (TM), and cytoplasmic domain, (semaphorin) 6A	NM_020796
SEPP1	Selenoprotein P, plasma, 1	NM_005410
SERPINA5	Serine (or cysteine) proteinase inhibitor, clade A (alpha-1 antiproteinase, antitrypsin), member 5	NM_000624
SERPINA7	Serine (or cysteine) proteinase inhibitor, clade A (alpha-1 antiproteinase, antitrypsin), member 7	NM_000354
SH2D1A	SH2 domain protein 1A, Duncan's disease (lymphoproliferative syndrome)	NM_002351
SLC16A6	Solute carrier family 16 (monocarboxylic acid transporters), member 6	NM_004694
SLC1A1	Solute carrier family 1 (neuronal/epithelial high affinity glutamate transporter, system Xag), member 1	NM_004170
SLC20A1	Solute carrier family 20 (phosphate transporter), member 1	NM_005415
SLC2A1	Solute carrier family 2 (facilitated glucose transporter), member 1	NM_006516
SLC39A8	Solute carrier family 39 (zinc transporter), member 8	NM_022154
SLC40A1	Solute carrier family 40 (iron-regulated transporter), member 1	NM_014585
SLC7A5	Solute carrier family 7 (cationic amino acid transporter, y+ system), member 5	NM_003486
SLC9A9	Solute carrier family 9 (sodium/hydrogen exchanger), isoform 9	NM_173653
SLIT3	Slit homolog 3 (Drosophila)	BC032027
SLPI	Secretory leukocyte protease inhibitor (antileukoproteinase)	NM_003064
SMOC1	SPARC related modular calcium binding 1	NM_022137
SMOC2	SPARC related modular calcium binding 2	NM_022138
SNAI2	Snail homolog 2 (Drosophila)	NM_003068
SNFT	Jun dimerization protein p21SNFT	NM_018664
SOCS1	Suppressor of cytokine signaling 1	NM_003745
SORL1	Sortilin-related receptor, L(DLR class) A repeats-containing	NM_003105
SOX4	SRY (sex determining region Y)-box 4	AW946823
SOX4	SRY (sex determining region Y)-box 4	NM_003107
SOX4	SRY (sex determining region Y)-box 4	NM_003107
SP5	Sp5 transcription factor	NM_001003845
Spc25	Kinetochore protein Spc25	NM_020675
SPHK1	Sphingosine kinase 1	NM_021972
SPINT2	Serine protease inhibitor, Kunitz type, 2	NM_021102
SRC	V-src sarcoma (Schmidt-Ruppin A-2) viral oncogene homolog (avian)	NM_005417

STAC	SH3 and cysteine rich domain	NM_003149
STC2	Stanniocalcin 2	NM_003714
STMN1	Stathmin 1/oncoprotein 18	NM_203401
T3JAM	TRAF3-interacting Jun N-terminal kinase (JNK)-activating modulator	NM_025228
TCEAL7	Transcription elongation factor A (SII)-like 7	NM_152278
TCF4	Transcription factor 4	AK021980
TIGD2	Tigger transposable element derived 2	NM_145715
TIMP3	Tissue inhibitor of metalloproteinase 3 (Sorsby fundus dystrophy, pseudoinflammatory)	AA837799
TK1	Thymidine kinase 1, soluble	NM_003258
TM4SF1	Transmembrane 4 superfamily member 1	NM_014220
TMPRSS4	Transmembrane protease, serine 4	NM_019894
TMSNB	Thymosin, beta, identified in neuroblastoma cells	NM_021992
TNC	Tenascin C (hexabrachion)	NM_002160
TncRNA	Trophoblast-derived noncoding RNA	U60873
TNFAIP6	Tumor necrosis factor, alpha-induced protein 6	NM_007115
TNFRSF17	Tumor necrosis factor receptor superfamily, member 17	NM_001192
TOP2A	Topoisomerase (DNA) II alpha 170kDa	NM_001067
TOPK	T-LAK cell-originated protein kinase	NM_018492
TPD52	Tumor protein D52	NM_005079
TPM1	Tropomyosin 1 (alpha)	NM_000366
TPX2	TPX2, microtubule-associated protein homolog (Xenopus laevis)	NM_012112
TRIB1	Tribbles homolog 1 (Drosophila)	NM_025195
TRIB2	Tribbles homolog 2 (Drosophila)	NM_021643
TROAP	Trophinin associated protein (tastin)	NM_005480
TRPS1	Trichorhinophalangeal syndrome I	NM_014112
TTK	TTK protein kinase	NM_003318
TXNIP	Thioredoxin interacting protein	NM_006472
TYRP1	Tyrosinase-related protein 1	NM_000550
UAP1	UDP-N-acetylglucosamine pyrophosphorylase 1	NM_003115
UBD	Ubiquitin D	NM_006398
UBE2C	Ubiquitin-conjugating enzyme E2C	NM_181803
UGT2B11	UDP glycosyltransferase 2 family, polypeptide B11	NM_001073
UST	Uronyl-2-sulfotransferase	NM_005715
UTS2	Urotensin 2	NM_021995
UTS2	Urotensin 2	NM_021995
VILI	Villin 1	NM_007127
YPEL4	Yippee-like 4 (Drosophila)	NM_145008
ZAP70	Zeta-chain (TCR) associated protein kinase 70kDa	NM_001079
ZNF179	Zinc finger protein 179	NM_007148
ZNF503	Zinc finger protein 503	NM_032772
		A_23_P15226
		A_23_P170719
		A_23_P43744
		A_24_P290087
		A_24_P686014
		A_24_P927205
		A_32_P182135
		A_32_P205792
		A_32_P225328
		A_32_P232647
		A_32_P55438
		AF256215
	Hypothetical gene supported by AK026189	AK022865
	CDNA: FLJ22994 fis, clone KAT11918	AK026647

	CDNA: FLJ23131 fis, clone LNG08502	AK026784
	CDNA FLJ31059 fis, clone HSYRA2000832	AK055621
	Hypothetical LOC388397	AK057167
	Homo sapiens, clone IMAGE:4214962, mRNA	AK091547
	CDNA FLJ41489 fis, clone BRTHA2004582	AK123483
	MRNA full length insert cDNA clone EUROIMAGE 51148	AK124841
	CDNA FLJ43172 fis, clone FCBBF3007242	AK125162
	CDNA FLJ26031 fis, clone PNC08078	AK129542
	Homo sapiens, clone IMAGE:5285282, mRNA	AK129982
	Similar to bA110H4.2 (similar to membrane protein)	AK130705
	Transcribed locus	AW972815
	Hypothetical gene supported by AY007155	AY007155
	Homo sapiens, clone IMAGE:3869276, mRNA	BC018597
	CDNA clone MGC:65154 IMAGE:5122136, complete cds	BC056907
		BE893137
	Transcribed locus, moderately similar to XP_497060.1 similar to FKSG60 [Homo sapiens]	BM989848
	Full-length cDNA clone CS0DJ001YJ05 of T cells (Jurkat cell line) Cot 10-normalized of Homo sapiens (human)	CR601458
	Full-length cDNA clone CS0DC002YA18 of Neuroblastoma Cot 25-normalized of Homo sapiens (human)	CR624517
		CR936791
		CR936791
		CX788817
		ENST00000245185
		ENST00000261569
		ENST00000312275
		ENST00000314238
		ENST00000343505
		ENST00000371256
		ENST00000371655
		ENST00000375377
		ENST00000381889
		NM_001006641
		NM_001008708
		NM_001010911
		NM_001010915
		NM_001011543
		NM_001012271
		NM_001017420
		NM_001017424
		NM_001017535
		NM_001040100
		NM_001040167
		NM_001040457
		NM_002263
		NM_003621
		NM_014867
		NM_017577
		NM_020872
		NM_020872
		NM_020872
		NM_025135

		NM_032199
		NM_032532
		NR_001558
		THC2274524
		THC2308675
		THC2343246
		THC2347909
		THC2373845
		THC2376729
		THC2398598
		THC2405710
		THC2406576
		THC2407823
		THC2438492
		THC2438512
		THC2442210
		THC2442586
		THC2443654
		THC2455149
	Similar to hypothetical protein LOC231503	XM_496707
		XM_932314

TABLE 5

Gene Symbol	Gene Name	Accession No.
ABCA6	ATP-binding cassette, sub-family A (ABC1), member 6	NM_080284
ADAMTS1	A disintegrin-like and metalloprotease (repolysin type) with thrombospondin type 1 motif, 1	NM_006988
ADAMTS1	A disintegrin-like and metalloprotease (repolysin type) with thrombospondin type 1 motif, 1	NM_006988
ADCY4	Adenylate cyclase 4	NM_139247
AFAP	Hypothetical protein LOC254848	BC014113
AGR2	Anterior gradient 2 homolog (Xenopus laevis)	NM_006408
ALOX5AP	Arachidonate 5-lipoxygenase-activating protein	NM_001629
AMD1	Adenosylmethionine decarboxylase 1	NM_001634
ANGPTL4	Angiopoietin-like 4	NM_139314
ANK1	Ankyrin 1, erythrocytic	NM_020478
ANK3	Ankyrin 3, node of Ranvier (ankyrin G)	NM_020987
ANLN	Anillin, actin binding protein (scraps homolog, Drosophila)	NM_018685
ANXA3	Annexin A3	NM_005139
APCDD1	Adenomatosis polyposis coli down-regulated 1	NM_153000
APOBEC3B	Apolipoprotein B mRNA editing enzyme, catalytic polypeptide-like 3B	NM_004900
APOL6	Apolipoprotein L, 6	NM_030641
AREG	Amphiregulin (schwannoma-derived growth factor)	NM_001657
ARHGDIB	Rho GDP dissociation inhibitor (GDI) beta	NM_001175
ARL4A	ADP-ribosylation factor-like 4A	NM_005738
ARRDC4	Arrestin domain containing 4	NM_183376
ASB9	Ankyrin repeat and SOCS box-containing 9	NM_024087
ASPA	Aspartoacylase (aminoacylase 2, Canavan disease)	NM_000049

ASPM	Asp (abnormal spindle)-like, microcephaly associated (Drosophila)	NM_018136
ASPM	Asp (abnormal spindle)-like, microcephaly associated (Drosophila)	NM_018136
ASRGL1	Asparaginase like 1	BC006267
ASRGL1	Asparaginase like 1	NM_025080
ATF3	Activating transcription factor 3	NM_004024
BCL11A	B-cell CLL/lymphoma 11A (zinc finger protein)	BU540282
BCL11A	B-cell CLL/lymphoma 11A (zinc finger protein)	NM_022893
BDKRB1	Bradykinin receptor B1	NM_000710
BDKRB2	Bradykinin receptor B2	NM_000623
BIRC5	Baculoviral IAP repeat-containing 5 (survivin)	BC007606
BNC1	Basonuclin 1	NM_001717
BNC2	Basonuclin 2	BC020879
BNC2	Basonuclin 2	NM_017637
BUB1	BUB1 budding uninhibited by benzimidazoles 1 homolog (yeast)	NM_004336
C10orf3	Chromosome 10 open reading frame 3	NM_018131
C13orf3	Chromosome 13 open reading frame 3	BC013418
C18orf11	Chromosome 18 open reading frame 11	NM_022751
C20orf103	Chromosome 20 open reading frame 103	NM_012261
C5orf13	Chromosome 5 open reading frame 13	NM_004772
C6orf176	Chromosome 6 open reading frame 176	CR618615
C8orf22	Chromosome 8 open reading frame 22	NM_001007176
CAV1	Caveolin 1, caveolae protein, 22kDa	NM_001753
CAV1	Caveolin 1, caveolae protein, 22kDa	NM_001753
CAV3	Caveolin 3	NM_001234
CCL2	Chemokine (C-C motif) ligand 2	NM_002982
CCNB1	Cyclin B1	NM_031966
CCNB2	Cyclin B2	NM_004701
CCR1	Chemokine (C-C motif) receptor 1	NM_001295
CD1A	CD1A antigen, a polypeptide	BC031645
CD200	CD200 antigen	NM_001004196
CD28	CD28 antigen (Tp44)	NM_006139
CD33	CD33 antigen (gp67)	NM_001772
CD38	CD38 antigen (p45)	NM_001775
CD3Z	CD3Z antigen, zeta polypeptide (TtT3 complex)	NM_198053
CDC2	Cell division cycle 2, G1 to S and G2 to M	NM_001786
CDC20	CDC20 cell division cycle 20 homolog (S. cerevisiae)	NM_001255
CDC37L1	Cell division cycle 37 homolog (S. cerevisiae)-like 1	NM_017913
CDCA1	Cell division cycle associated 1	NM_145697
CDCA2	Cell division cycle associated 2	NM_152562
CDCA7	Cell division cycle associated 7	NM_031942
CDCA8	Cell division cycle associated 8	NM_018101
CDH1	Cadherin 1, type 1, E-cadherin (epithelial)	NM_004360
CDH18	Cadherin 18, type 2	NM_004934
CDKN3	Cyclin-dependent kinase inhibitor 3 (CDK2-associated dual specificity phosphatase)	NM_005192
CENPA	Centromere protein A, 17kDa	NM_001809

CENPF	Centromere protein F, 350/400ka (mitosin)	NM_016343
CGA	Glycoprotein hormones, alpha polypeptide	NM_000735
CGA	Glycoprotein hormones, alpha polypeptide	NM_000735
CH25H	Cholesterol 25-hydroxylase	NM_003956
CHD7	Chromodomain helicase DNA binding protein 7	NM_017780
CHSY1	Carbohydrate (chondroitin) synthase 1	NM_014918
CISH	Cytokine inducible SH2-containing protein	NM_145071
CITED4	Cbp/p300-interacting transactivator, with Glu/Asp-rich carboxy-terminal domain, 4	NM_133467
CLDN11	Claudin 11 (oligodendrocyte transmembrane protein)	AF085871
CLIC3	Chloride intracellular channel 3	NM_004669
CMKOR1	Chemokine orphan receptor 1	NM_020311
CMRF-35H	Leukocyte membrane antigen	NM_007261
CNIH3	Cornichon homolog 3 (Drosophila)	NM_152495
COBL1	COBL-like 1	NM_014900
COCH	Coagulation factor C homolog, cochlin (Limulus polyphemus)	NM_004086
COL3A1	Collagen, type III, alpha 1 (Ehlers-Danlos syndrome type IV, autosomal dominant)	NM_000090
COL4A6	Collagen, type IV, alpha 6	NM_033641
COL8A1	Collagen, type VIII, alpha 1	AL359062
CPB2	Carboxypeptidase B2 (plasma, carboxypeptidase U)	NM_001872
CTGF	Connective tissue growth factor	NM_001901
CTNNAL1	Catenin (cadherin-associated protein), alpha-like 1	NM_003798
CTNND2	Catenin (cadherin-associated protein), delta 2 (neural plakophilin-related arm-repeat protein)	NM_001332
CX3CR1	Chemokine (C-X3-C motif) receptor 1	NM_001337
CXCL1	Chemokine (C-X-C motif) ligand 1 (melanoma growth stimulating activity, alpha)	NM_001511
CXCR4	chemokine (C-X-C motif) receptor 4	NM_001008540
DDC	Dopa decarboxylase (aromatic L-amino acid decarboxylase)	NM_000790
DEPDC1	DEP domain containing 1	NM_017779
DEPDC1B	DEP domain containing 1B	NM_018369
DKFZP434B061	DKFZP434B061 protein	AL117481
DKFZP547L112	Hypothetical protein DKFZp547L112	AL512723
DKFZP586A0522	DKFZP586A0522 protein	NM_014033
DKFZP586A0522	DKFZP586A0522 protein	NM_014033
DKK2	Dickkopf homolog 2 (Xenopus laevis)	NM_014421
DLG7	Discs, large homolog 7 (Drosophila)	NM_014750
DMD	Dystrophin (muscular dystrophy, Duchenne and Becker types)	NM_004010
DNAJC12	DnaJ (Hsp40) homolog, subfamily C, member 12	NM_021800
DNM3	Dynamin 3	AK021543
DOK1	Docking protein 1, 62kDa (downstream of tyrosine kinase 1)	NM_001381
DPPA4	Developmental pluripotency associated 4	NM_018189
DUSP6	Dual specificity phosphatase 6	NM_001946
ECM2	Extracellular matrix protein 2, female organ and adipocyte specific	NM_001393
EDN1	Endothelin 1	NM_001955

EFNB2	Ephrin-B2	NM_004093
EGLN3	Egl nine homolog 3 (C. elegans)	NM_022073
EGR1	Early growth response 1	NM_001964
ELF3	E74-like factor 3 (ets domain transcription factor, epithelial-specific)	NM_004433
EN1	Engrailed homolog 1	NM_001426
ENC1	Ectodermal-neural cortex (with BTB-like domain)	NM_003633
ENC1	Ectodermal-neural cortex (with BTB-like domain)	NM_003633
EPB41L4B	Erythrocyte membrane protein band 4.1 like 4B	NM_018424
EPHA4	EPH receptor A4	NM_004438
EPHX2	Epoxide hydrolase 2, cytoplasmic	NM_001979
EVA1	Epithelial V-like antigen 1	NM_144765
EXOSC8	Exosome component 8	NM_181503
EXOSC8	Exosome component 8	NM_181503
F11	Coagulation factor XI (plasma thromboplastin antecedent)	NM_000128
F3	Coagulation factor III (thromboplastin, tissue factor)	NM_001993
FA2H	Fatty acid 2-hydroxylase	NM_024306
FADS1	Fatty acid desaturase 1	NM_013402
FBXL16	F-box and leucine-rich repeat protein 16	NM_153350
FBXO32	F-box protein 32	NM_058229
FCGBP	Fc fragment of IgG binding protein	NM_003890
FGA	Fibrinogen, A alpha polypeptide	NM_000508
FGF7	Galactokinase 2	NM_002009
FGF7	Galactokinase 2	NM_002009
FHL2	Four and a half LIM domains 2	NM_201555
FLJ10156	Hypothetical protein FLJ10156	NM_019013
FLJ10901	Hypothetical protein FLJ10901	NM_018265
FLJ13072	Hypothetical gene FLJ13072	AK023134
FLJ13391	Hypothetical protein FLJ13391	NM_032181
FLJ13840	Hypothetical protein FLJ13840	BC007638
FLJ14712	Hypothetical protein FLJ14712	AK027618
FLJ14834	Hypothetical protein FLJ14834	NM_032849
FLJ30681	KIAA1983 protein	NM_133459
FLJ31340	Hypothetical protein FLJ31340	NM_152748
FLJ31461	Hypothetical protein FLJ31461	NM_152454
FLJ35767	FLJ35767 protein	NM_207459
FLJ36031	Hypothetical protein FLJ36031	AK098422
FLJ37478	Hypothetical protein FLJ37478	NM_178557
FLJ37970	Hypothetical protein FLJ37970	NM_032251
FLJ39739	FLJ39739 protein	AK026418
FLJ45273	FLJ45273 protein	NM_198461
FLRT2	Fibronectin leucine rich transmembrane protein 2	NM_013231
FOS	V-fos FBJ murine osteosarcoma viral oncogene homolog	NM_005252
FOXA1	Forkhead box A1	NM_004496
FOXA2	Forkhead box A2	NM_021784
FOXM1	Forkhead box M1	NM_202002
FOXQ1	Forkhead box Q1	NM_033260
FRMD3	FERM domain containing 3	BG216229

FZD10	Frizzled homolog 10 (Drosophila)	NM_007197
G2	G2 protein	U10991
GAJ	GAJ protein	NM_032117
GAS1	Growth arrest-specific 1	NM_002048
GATA6	GATA binding protein 6	NM_005257
GDF15	Growth differentiation factor 15	NM_004864
GDF3	Growth differentiation factor 3	NM_020634
GEM	GTP binding protein overexpressed in skeletal muscle	NM_005261
GPR68	G protein-coupled receptor 68	NM_003485
GREM1	Gremlin 1 homolog, cysteine knot superfamily (Xenopus laevis)	NM_013372
GSG1	Germ cell associated 1	NM_031289
GTSE1	G-2 and S-phase expressed 1	NM_016426
HCAP-G	Chromosome condensation protein G	NM_022346
HLF	Hepatic leukemia factor	NM_002126
HMMR	Hyaluronan-mediated motility receptor (RHAMM)	NM_012484
HRH1	Histamine receptor H1	NM_000861
HS6ST2	Heparan sulfate 6-O-sulfotransferase 2	NM_147175
HSD11B2	Hydroxysteroid (11-beta) dehydrogenase 2	NM_000196
HT008	Uncharacterized hypothalamus protein HT008	NM_018469
ID1	Inhibitor of DNA binding 1, dominant negative helix-loop-helix protein	NM_002165
IFI44	Interferon-induced protein 44	NM_006417
IL10RA	Interleukin 10 receptor, alpha	NM_001558
IL6	Interleukin 6 (interferon, beta 2)	NM_000600
INSIG2	Insulin induced gene 2	NM_016133
INSIG2	Insulin induced gene 2	NM_016133
IRF5	Interferon regulatory factor 5	NM_002200
IRX4	Iroquois homeobox protein 4	NM_016358
JAG1	Jagged 1 (Alagille syndrome)	NM_000214
KCNH2	Potassium voltage-gated channel, subfamily H (eag-related), member 2	NM_000238
KCNK6	Potassium channel, subfamily K, member 6	NM_004823
KCNMB4	Potassium large conductance calcium-activated channel, subfamily M, beta member 4	NM_014505
KIAA0101	KIAA0101	NM_014736
KIAA1199	KIAA1199	NM_018689
KIAA1217	KIAA1217	AK022045
KIAA1509	KIAA1509	AB040942
KIAA1666	KIAA1666 protein	BC035246
KIAA1913	KIAA1913	BC044246
KIF20A	Kinesin family member 20A	NM_005733
KIF2C	Kinesin family member 2C	NM_006845
KLF2	Kruppel-like factor 2 (lung)	NM_016270
KLRC3	Killer cell lectin-like receptor subfamily C, member 2	NM_002260
KNSL7	Kinesin-like 7	NM_020242
KNTC2	Kinetochore associated 2	NM_006101
KRTAP1-5	Keratin associated protein 1-5	NM_031957
KRTHB6	Keratin, hair, basic, 6 (monilethrix)	NM_002284

LAD1	Ladinin 1	NM_005558
LAMA2	Laminin, alpha 2 (merosin, congenital muscular dystrophy)	NM_000426
LAPTM5	Lysosomal associated multispinning membrane protein 5	NM_006762
LASS5	LAG1 longevity assurance homolog 5 (<i>S. cerevisiae</i>)	NM_147190
LEF1	Lymphoid enhancer-binding factor 1	NM_016269
LGALS2	Lectin, galactoside-binding, soluble, 2 (galectin 2)	NM_006498
LHX2	LIM homeobox 2	NM_004789
LOC120224	Hypothetical protein BC016153	NM_138788
LOC150166	Hypothetical protein LOC150166	AK056836
LOC150271	Hypothetical LOC388889	AK098753
LOC150759	Hypothetical protein LOC150759	AK057596
LOC222171	Hypothetical protein LOC222171	NM_175887
LOC284018	Hypothetical protein LOC284018	NM_181655
LOC285733	Hypothetical protein LOC285733	AK091900
LOC286254	Hypothetical protein LOC286254	AK092751
LOC338773	Hypothetical protein LOC338773	NM_181724
LOC92312	Hypothetical protein LOC92312	XM_044166
LOXL3	Lysyl oxidase-like 3	NM_032603
LPL	Lipoprotein lipase	NM_000237
LRP12	Low density lipoprotein-related protein 12	NM_013437
LRP12	Low density lipoprotein-related protein 12	NM_013437
LRP8	Low density lipoprotein receptor-related protein 8, apolipoprotein e receptor	NM_033300
LRRC5	Leucine rich repeat containing 5	NM_018103
LTBP2	Latent transforming growth factor beta binding protein 2	NM_000428
LYPDC1	LY6/PLAUR domain containing 1	NM_144586
MAD2L1	MAD2 mitotic arrest deficient-like 1 (yeast)	NM_002358
MAFB	V-maf musculoaponeurotic fibrosarcoma oncogene homolog B (avian)	NM_005461
MAGEA1	Melanoma antigen, family A, 1 (directs expression of antigen MZ2-E)	NM_004988
MAL2	Mal, T-cell differentiation protein 2	NM_052886
MAOB	Monoamine oxidase B	NM_000898
MAP7	Microtubule-associated protein 7	NM_003980
MASP1	Mannan-binding lectin serine protease 1 (C4/C2 activating component of Ra-reactive factor)	NM_139125
MCM10	MCM10 minichromosome maintenance deficient 10 (<i>S. cerevisiae</i>)	NM_182751
MEST	Mesoderm specific transcript homolog (mouse)	NM_002402
MGAT3	Mannosyl (beta-1,4-)-glycoprotein beta-1,4-N-acetylglucosaminyltransferase	AK125361
MGC16121	Hypothetical protein MGC16121	BC007360
MGC22265	Hypothetical protein MGC22265	BC048193
MGC2574	Hypothetical protein MGC2574	NM_024098
MGC2610	Hypothetical protein MGC2610	NM_144711
MGC27165	Hypothetical protein MGC27165	AF343666
MGC33365	Hypothetical protein MGC33365	NM_173552
MK2S4	Protein kinase substrate MK2S4	NM_052862
MMP12	Matrix metalloproteinase 12 (macrophage elastase)	NM_002426

MSX1	Msh homeo box homolog 1 (Drosophila)	NM_002448
MSX1	Msh homeo box homolog 1 (Drosophila)	NM_002448
MT1B	Metallothionein 1B (functional)	NM_005947
MT1E	Metallothionein 1E (functional)	NM_175617
MT1G	Metallothionein 1G	NM_005950
MT1H	Metallothionein 1H	NM_005951
MT1H	Metallothionein 1H	NM_005951
MT1K	Metallothionein 1K	NM_176870
MT1L	Metallothionein 1L	X97261
MT1X	Metallothionein 1X	NM_005952
MT1X	Metallothionein 1X	NM_005952
MT2A	Metallothionein 2A	NM_005953
MT2A	Metallothionein 2A	NM_005953
MYB	V-myb myeloblastosis viral oncogene homolog (avian)	NM_005375
MYBL1	V-myb myeloblastosis viral oncogene homolog (avian)-like 1	X66087
MYLIP	Myosin regulatory light chain interacting protein	NM_013262
MYO10	Myosin X	NM_012334
MYO1G	Myosin IG	NM_033054
MYO5B	Myosin VB	AK025336
MYO5C	Myosin VC	NM_018728
MYRIP	Myosin VIIA and Rab interacting protein	NM_015460
NAP1L1	Nucleosome assembly protein 1-like 1	NM_139207
NAV2	Neuron navigator 2	NM_182964
NEK2	NIMA (never in mitosis gene a)-related kinase 2	NM_002497
NET1	Neuroepithelial cell transforming gene 1	NM_005863
NFE2	Nuclear factor (erythroid-derived 2), 45kDa	NM_006163
NFE2L3	Nuclear factor (erythroid-derived 2)-like 3	NM_004289
NFIL3	Nuclear factor, interleukin 3 regulated	NM_005384
NGEF	Neuronal guanine nucleotide exchange factor	NM_019850
NID2	Nidogen 2 (osteonidogen)	NM_007361
NOSTRIN	Nitric oxide synthase trafficker	NM_052946
NOV	Nephroblastoma overexpressed gene	NM_002514
NPTX1	Neuronal pentraxin I	NM_002522
NR0B1	Nuclear receptor subfamily 0, group B, member 1	NM_000475
NR2F1	Nuclear receptor subfamily 2, group F, member 1	NM_005654
NSE1	NSE1	NM_145175
NSE2	Breast cancer membrane protein 101	NM_174911
NTN4	Netrin 4	NM_021229
NUP210	Nucleoporin 210kDa	NM_024923
NUSAP1	Nucleolar and spindle associated protein 1	NM_016359
ODZ3	Odz, odd Oz/ten-m homolog 3 (Drosophila)	AB040888
ODZ3	Odz, odd Oz/ten-m homolog 3 (Drosophila)	AB040888
OIP5	Opa-interacting protein 5	NM_007280
OLIG1	Oligodendrocyte transcription factor 1	NM_138983
OSAP	Ovary-specific acidic protein	NM_032623
OVOS2	Ovostatin 2	BC039117
P2RY8	Purinergic receptor P2Y, G-protein coupled, 8	NM_178129

PAPPA	Pregnancy-associated plasma protein A, pappalysin 1	NM_002581
PAQR4	Progestin and adipoQ receptor family member IV	NM_152341
PASD1	PAS domain containing 1	NM_173493
PBEF1	Pre-B-cell colony enhancing factor 1	NM_005746
PBEF1	Pre-B-cell colony enhancing factor 1	NM_005746
PBEF1	Pre-B-cell colony enhancing factor 1	NM_182790
PCSK5	Proprotein convertase subtilisin/kexin type 5	NM_006200
PDGFC	Platelet derived growth factor C	NM_016205
PEPP-2	PEPP subfamily gene 2	NM_032498
PHLDA1	Pleckstrin homology-like domain, family A, member 1	NM_007350
PIK3R1	Phosphoinositide-3-kinase, regulatory subunit 1 (p85 alpha)	NM_181523
PIM1	Pim-1 oncogene	NM_002648
PITX2	Paired-like homeodomain transcription factor 2	NM_153426
PLAC8	Placenta-specific 8	NM_016619
PLAC8	Placenta-specific 8	NM_016619
PLD1	Phospholipase D1, phosphatidylcholine-specific	NM_002662
PLK2	Polo-like kinase 2 (Drosophila)	NM_006622
PLOD2	Procollagen-lysine, 2-oxoglutarate 5-dioxygenase (lysine hydroxylase) 2	NM_182943
PLP1	Proteolipid protein 1 (Pelizaeus-Merzbacher disease, spastic paraplegia 2, uncomplicated)	M54927
PMAIP1	Phorbol-12-myristate-13-acetate-induced protein 1	NM_021127
PON3	Paraoxonase 3	NM_000940
POSTN	Periostin, osteoblast specific factor	NM_006475
PPP1R1A	Protein phosphatase 1, regulatory (inhibitor) subunit 1A	NM_006741
PPP1R3B	Protein phosphatase 1, regulatory (inhibitor) subunit 3B	AK091994
PRC1	Protein regulator of cytokinesis 1	NM_003981
PREX1	Phosphatidylinositol 3,4,5-trisphosphate-dependent RAC exchanger 1	NM_020820
PSD3	Pleckstrin and Sec7 domain containing 3	NM_015310
PSD3	Pleckstrin and Sec7 domain containing 3	NM_015310
PSG1	Pregnancy specific beta-1-glycoprotein 1	NM_006905
PSG3	Pregnancy specific beta-1-glycoprotein 3	NM_021016
PTGFR	Prostaglandin F receptor (FP)	NM_000959
PTGIR	Prostaglandin I2 (prostacyclin) receptor (IP)	NM_000960
PTTG1	Pituitary tumor-transforming 1	NM_004219
PTTG2	Pituitary tumor-transforming 2	NM_006607
RACGAP1	Rac GTPase activating protein 1	NM_013277
RAMP1	Receptor (calcitonin) activity modifying protein 1	NM_005855
RANBP9	RAN binding protein 9	NM_005493
RANBP9	RAN binding protein 9	NM_005493
RASD1	RAS, dexamethasone-induced 1	NM_016084
RASGRP1	RAS guanyl releasing protein 1 (calcium and DAG-regulated)	NM_005739
RGS2	Regulator of G-protein signalling 2, 24kDa	NM_002923
RIPK3	Receptor-interacting serine-threonine kinase 3	NM_006871
RTN4R	Reticulon 4 receptor	NM_023004
S100B	S100 calcium binding protein, beta (neural)	NM_006272

SAMSN1	SAM domain, SH3 domain and nuclear localisation signals, 1	NM_022136
SECTM1	Secreted and transmembrane 1	NM_003004
SEMA3C	Sema domain, immunoglobulin domain (Ig), short basic domain, secreted, (semaphorin) 3C	NM_006379
SEMA3D	Sema domain, immunoglobulin domain (Ig), short basic domain, secreted, (semaphorin) 3D	NM_152754
SERPINA5	Serine (or cysteine) proteinase inhibitor, clade A (alpha-1 antiproteinase, antitrypsin), member 5	NM_000624
SGOL2	Shugoshin-like 2 (S. pombe)	NM_152524
SIAT7C	Sialyltransferase 7 ((alpha-N-acetylneuraminyl-2,3-beta-galactosyl-1,3)-N-acetyl galactosaminide alpha-2,6-sialyltransferase) C	NM_152996
SLC24A3	Solute carrier family 24 (sodium/potassium/calcium exchanger), member 3	NM_020689
SLC27A2	Solute carrier family 27 (fatty acid transporter), member 2	NM_003645
SLC2A1	Solute carrier family 2 (facilitated glucose transporter), member 1	NM_006516
SLC39A8	Solute carrier family 39 (zinc transporter), member 8	NM_022154
SLC40A1	Solute carrier family 40 (iron-regulated transporter), member 1	NM_014585
SLC7A5	Solute carrier family 7 (cationic amino acid transporter, y+ system), member 5	NM_003486
SMARCA3	SWI/SNF related, matrix associated, actin dependent regulator of chromatin, subfamily a, member 3	NM_139048
SMOC1	SPARC related modular calcium binding 1	NM_022137
SMOC2	SPARC related modular calcium binding 2	NM_022138
SNAI2	Snail homolog 2 (Drosophila)	NM_003068
SNFT	Jun dimerization protein p21SNFT	NM_018664
SNX10	Sorting nexin 10	NM_013322
SOCS1	Suppressor of cytokine signaling 1	NM_003745
SOCS3	Suppressor of cytokine signaling 3	NM_003955
SOX2	SRY (sex determining region Y)-box 2	NM_003106
SOX4	SRY (sex determining region Y)-box 4	AW946823
SOX4	SRY (sex determining region Y)-box 4	NM_003107
SOX4	SRY (sex determining region Y)-box 4	NM_003107
SP5	Sp5 transcription factor	NM_001003845
SPAG5	Sperm associated antigen 5	NM_006461
SPHK1	Sphingosine kinase 1	NM_021972
SPINT2	Serine protease inhibitor, Kunitz type, 2	NM_021102
SPTA1	Spectrin, alpha, erythrocytic 1 (elliptocytosis 2)	NM_003126
STAC	SH3 and cysteine rich domain	NM_003149
STC2	Stanniocalcin 2	NM_003714
STMN1	Stathmin 1/ncoprotein 18	NM_203401
SYTL5	Synaptotagmin-like 5	BX647688
T3JAM	TRAF3-interacting Jun N-terminal kinase (JNK)-activating modulator	NM_025228
TCEAL7	Transcription elongation factor A (SII)-like 7	NM_152278
TFPI2	Tissue factor pathway inhibitor 2	NM_006528
THSD2	Thrombospondin, type I, domain containing 2	NM_032784
TIMP3	Tissue inhibitor of metalloproteinase 3 (Sorsby fundus dystrophy, pseudoinflammatory)	AA837799

TK1	Thymidine kinase 1, soluble	NM_003258
TM4SF1	Transmembrane 4 superfamily member 1	NM_014220
TMSNB	Thymosin, beta, identified in neuroblastoma cells	NM_021992
TNC	Tenascin C (hexabrachion)	NM_002160
TncRNA	Trophoblast-derived noncoding RNA	U60873
TNFRSF17	Tumor necrosis factor receptor superfamily, member 17	NM_001192
TOP2A	Topoisomerase (DNA) II alpha 170kDa	NM_001067
TOPK	T-LAK cell-originated protein kinase	NM_018492
TPD52	Tumor protein D52	NM_005079
TPX2	TPX2, microtubule-associated protein homolog (Xenopus laevis)	NM_012112
TRIB1	Tribbles homolog 1 (Drosophila)	NM_025195
TRIM45	Tripartite motif-containing 45	NM_025188
TROAP	Trophinin associated protein (tastin)	NM_005480
TRPS1	Trichorhinophalangeal syndrome I	NM_014112
TWIST1	Twist homolog 1 (acrocephalosyndactyly 3; Saethre-Chotzen syndrome) (Drosophila)	NM_000474
TYR	Tyrosinase (oculocutaneous albinism IA)	NM_000372
TYRP1	Tyrosinase-related protein 1	NM_000550
UAP1	UDP-N-acetylglucosamine pyrophosphorylase 1	NM_003115
UBD	Ubiquitin D	NM_006398
UBE2C	Ubiquitin-conjugating enzyme E2C	NM_181803
UTS2	Urotensin 2	NM_021995
UTS2	Urotensin 2	NM_021995
VCX3	Variable charge, X-linked	NM_016379
XK	Kell blood group precursor (McLeod phenotype)	NM_021083
YPEL4	Yippee-like 4 (Drosophila)	NM_145008
ZBTB20	Zinc finger and BTB domain containing 20	BC010934
		A_23_P170719
		A_23_P28927
		A_24_P112542
		A_24_P195454
		A_24_P290087
		A_24_P358131
		A_24_P927205
		A_32_P225328
		A_32_P75141
		AF256215
	MRNA (fetal brain cDNA g6_1g)	AI791206
	Hypothetical gene supported by AK026189	AK022865
	Hypothetical gene supported by AK026328	AK026328
	CDNA: FLJ23131 fis, clone LNG08502	AK026784
	CDNA FLJ31059 fis, clone HSYRA2000832	AK055621
	Homo sapiens, clone IMAGE:4214962, mRNA	AK091547
		AK098506
	Homo sapiens, clone IMAGE:4512785, mRNA	AK124558
	CDNA FLJ43172 fis, clone FCBBF3007242	AK125162
	CDNA FLJ26031 fis, clone PNC08078	AK129542
	Transcribed locus	AW972815

		BC005081
	Similar to ankyrin repeat domain 20A	BC016022
	Homo sapiens, clone IMAGE:3869276, mRNA	BC018597
	Homo sapiens, Similar to hect domain and RLD 2, clone IMAGE:4581928, mRNA	BC018626
	Homo sapiens, clone IMAGE:3357292, mRNA, partial cds	BC033117
	CDNA clone MGC:65154 IMAGE:5122136, complete cds	BC056907
	MRNA; cDNA DKFZp586O0724 (from clone DKFZp586O0724)	BF508144
	Transcribed locus	BQ717518
	Transcribed locus, strongly similar to XP_355557.2 similar to multi sex combs CG12058-PA [Mus musculus]	CD048206
	Full-length cDNA clone CS0DM001YA20 of Fetal liver of Homo sapiens (human)	CR601260
	Full-length cDNA clone CS0DJ001YJ05 of T cells (Jurkat cell line) Cot 10-normalized of Homo sapiens (human)	CR601458
	Full-length cDNA clone CS0DC002YA18 of Neuroblastoma Cot 25-normalized of Homo sapiens (human)	CR624517
		CR936791
		CX788817
		ENST00000245185
		ENST00000261569
		ENST00000369158
		ENST00000371256
		ENST00000371327
		ENST00000371655
		ENST00000374541
		ENST00000375077
		ENST00000375855
		ENST00000376155
		ENST00000381889
		NM_001006641
		NM_001009954
		NM_001010911
		NM_001010915
		NM_001012271
		NM_001017424
		NM_001017535
		NM_001017915
		NM_001017978
		NM_001018115
		NM_001031716
		NM_001040100
		NM_001040167
		NM_002263
		NM_003621

		NM_012454
		NM_014867
		NM_020872
		NM_020872
		NM_025135
		NM_032199
		NM_032521
		NR_001564
		THC2270231
		THC2281706
		THC2281732
		THC2282958
		THC2309960
		THC2314600
		THC2317680
		THC2343936
		THC2347909
		THC2364621
		THC2373845
		THC2376729
		THC2381061
		THC2407823
		THC2411757
		THC2434166
		THC2438492
		THC2442210
		THC2446045
		W95609
	Similar to hypothetical protein LOC231503	XM_496707
		XM_934971

This invention is not limited in its application to the details of construction and the arrangement of components set forth in the following description or illustrated in the drawings. The invention is capable of other embodiments and of being practiced or of being carried out in various ways. Also, the phraseology and terminology used herein is for the purpose of description and should not be regarded as limiting. The use of “including,” “comprising,” or “having,” “containing,” “involving,” and variations thereof herein, is meant to encompass the items listed thereafter and equivalents thereof as well as additional items.

Each of the foregoing patents, patent applications and references is hereby incorporated by reference, particularly for the teaching referenced herein.

Having thus described several aspects of at least one embodiment of this invention, it is to be appreciated various alterations, modifications, and improvements will readily occur to

those skilled in the art. Such alterations, modifications, and improvements are intended to be part of this disclosure, and are intended to be within the spirit and scope of the invention. Accordingly, the foregoing description and drawings are by way of example only.

Table 1A - FDR for Change in Gene Expression Values Between Pre-and Post-Treatment Responders

Agilent Probe ID	Gene Symbol	Gene Name	Accession	Entrez Gene ID	FDR
AGL_HUM1_OLIGO_A_24_P745883			A_24_P745883		0.032464275
AGL_HUM1_OLIGO_A_24_P243396			NM_001008657		0.039492348
AGL_HUM1_OLIGO_A_24_P53080	ETFA	Electron-transfer-flavoprotein, alpha polypeptide (glutaric aciduria II)	NM_000126	2108	0.039492348
AGL_HUM1_OLIGO_A_23_P117298	F7	Coagulation factor VII (serum prothrombin conversion accelerator)	NM_000131	2155	0.060597251
AGL_HUM1_OLIGO_A_23_P14124	RASL11A	RAS-like, family 11, member A	NM_206827	387496	0.060597251
AGL_HUM1_OLIGO_A_23_P156708	TXNB	Tenascin XB	NM_019105	7148	0.060597251
AGL_HUM1_OLIGO_A_23_P205177	F10	Coagulation factor X	NM_000504	2159	0.060597251
AGL_HUM1_OLIGO_A_23_P345650	KIAA1280	KIAA1280 protein	NM_015691	55841	0.060597251
AGL_HUM1_OLIGO_A_23_P5281	LYL1	Lymphoblastic leukemia derived sequence 1	NM_005583	4066	0.060597251
AGL_HUM1_OLIGO_A_24_P169843	NIPBL	Nipped-B homolog (Drosophila)	A_24_P169843		0.060597251
AGL_HUM1_OLIGO_A_24_P180383	NDRG3	NDRG family member 3	NM_015384	25836	0.060597251
AGL_HUM1_OLIGO_A_24_P29966	TRIM32	Tripartite motif-containing 32	NM_032013	57446	0.060597251
AGL_HUM1_OLIGO_A_24_P727884	G2	G2 protein	NM_012210	22954	0.060597251
AGL_HUM1_OLIGO_A_24_P924040	SSFA2	Sperm specific antigen 2	U10991	25758	0.060597251
AGL_HUM1_OLIGO_A_23_P162866	MLPH	Melanophilin	NM_006751	6744	0.060597251
AGL_HUM1_OLIGO_A_23_P165783	HSPCA	Heat shock 90kDa protein 1, alpha	NM_024101	79083	0.068421106
AGL_HUM1_OLIGO_A_23_P4363	CASKIN2	CASK interacting protein 2	NM_005348	3320	0.070083415
AGL_HUM1_OLIGO_A_23_P45324	TMEM35	Transmembrane protein 35	NM_020753	57513	0.070083415
AGL_HUM1_OLIGO_A_23_P130418	NDUFV2	NADH dehydrogenase (ubiquinone) flavoprotein 2, 24kDa	NM_021637	59353	0.070083415
AGL_HUM1_OLIGO_A_23_P203115	TMEM25	Transmembrane protein 25	NM_021074	4729	0.075584295
AGL_HUM1_OLIGO_A_23_P502363	EYA1	Eyes absent homolog 1 (Drosophila)	NM_032780	84866	0.075584295
AGL_HUM1_OLIGO_A_23_P52227	GDF10	Growth differentiation factor 10	NM_000503	2138	0.075584295
AGL_HUM1_OLIGO_A_23_P94103	MGC45780	Hypothetical protein MGC45780	NM_004962	2662	0.075584295
AGL_HUM1_OLIGO_A_24_P607904	ITGA9	Integrin, alpha 9	NM_173833	286133	0.075584295
AGL_HUM1_OLIGO_A_23_P106532	DAST1	Dermatan 4 sulfotransferase 1	AK026826	3680	0.075584295
AGL_HUM1_OLIGO_A_23_P111860	FLJ10324	Hypothetical protein FLJ10324	NM_130468	113189	0.083158024
AGL_HUM1_OLIGO_A_23_P11664	SFRS11	Splicing factor, arginine/serine-rich 11	NM_018059	55698	0.083158024
AGL_HUM1_OLIGO_A_23_P121533	SPON2	Spondin 2, extracellular matrix protein	NM_004768	9295	0.083158024
AGL_HUM1_OLIGO_A_23_P133694	SLC29A1	Solute carrier family 29 (nucleoside transporters), member 1	NM_012445	10417	0.083158024
AGL_HUM1_OLIGO_A_23_P153640	ANKRD27	Ankyrin repeat domain 27 (VPS9 domain)	NM_004955	2030	0.083158024
			NM_032139	84079	0.083158024
		Mannan-binding lectin serine protease 1 (C4/C2 activating component of Ra-reactive factor)			
AGL_HUM1_OLIGO_A_23_P30363	MASPI	Myosin-binding protein 1	NM_139125	5648	0.083158024
AGL_HUM1_OLIGO_A_23_P212339	FCOI1	FYVE and coiled-coil domain containing 1	NM_024513	79443	0.083158024
AGL_HUM1_OLIGO_A_23_P21324	TWIST2	Twist homolog 2 (Drosophila)	NM_057179	117581	0.083158024
AGL_HUM1_OLIGO_A_23_P253982	HOXA4	Homeo box A4	NM_002141	3201	0.083158024
AGL_HUM1_OLIGO_A_23_P28507	MGC52110	Hypothetical protein MGC52110	NM_012214	493753	0.083158024
		Procollagen-proline, 2-oxoglutarate 4-dioxygenase (proline 4-hydroxylase), alpha polypeptide II			
AGL_HUM1_OLIGO_A_23_P30363	PAHA2	Proline 4-hydroxylase, alpha polypeptide II	NM_004199	8974	0.083158024
AGL_HUM1_OLIGO_A_23_P345692	IL17D	Interleukin 17D	NM_138284	53342	0.083158024
AGL_HUM1_OLIGO_A_23_P3562	FLJ13291	Hypothetical protein FLJ13291	NM_032178	84138	0.083158024
AGL_HUM1_OLIGO_A_23_P40072	MTF2	Mitochondrial translational initiation factor 2	NM_001005369	4528	0.083158024
AGL_HUM1_OLIGO_A_23_P41976	LOC133957	Similar to RIKEN cDNA 0610011N22	NM_145265	133957	0.083158024
AGL_HUM1_OLIGO_A_23_P422851	CABLES1	Cdk5 and Abl enzyme substrate 1	NM_138375	91768	0.083158024
AGL_HUM1_OLIGO_A_23_P430181	ZBTB3	Zinc finger and BTB domain containing 3	NM_024784	79842	0.083158024
AGL_HUM1_OLIGO_A_23_P432598	Snax3	Snaf7 homologue associated with Alix 3	NM_152284	92421	0.083158024
AGL_HUM1_OLIGO_A_23_P433016	FBLN1	Fibulin 1	NM_001996	2192	0.083158024
AGL_HUM1_OLIGO_A_23_P500410	ATP6V1G2	ATPase, H+ transporting, lysosomal 13kDa, V1 subunit G isoform 2	NM_130463	534	0.083158024
AGL_HUM1_OLIGO_A_23_P56578	VIT	Vitrin	NM_053276	5212	0.083158024
AGL_HUM1_OLIGO_A_23_P74229	MGC4796	Ser/Thr-like kinase	NM_032017	83931	0.083158024
AGL_HUM1_OLIGO_A_23_P77568	EIF3S8	Eukaryotic translation initiation factor 3, subunit 8, 110kDa	NM_003752	8663	0.083158024
AGL_HUM1_OLIGO_A_23_P8240	FAW50B	Family with sequence similarity 50, member B	NM_012135	26240	0.083158024
AGL_HUM1_OLIGO_A_23_P87839	SFR52IP	Splicing factor, arginine/serine-rich 2, interacting protein	NM_004719	9169	0.083158024
AGL_HUM1_OLIGO_A_24_P137501	SFRP2	Secreted frizzled-related protein 2	NM_003013	6423	0.083158024

Table 1A - FDR for Change in Gene Expression Values Between Pre-and Post-Treatment Responders

Agilent Probe ID	Gene Symbol	Gene Name	Accession	Entrez Gene ID	FDR
AGL_HUM1_OLIGO_A_24_P184385	LOC220074	Hypothetical 55.1 kDa protein F09G8.5 in chromosome III	NM_145309	220074	0.083158024
AGL_HUM1_OLIGO_A_24_P184388	LOC220074	Hypothetical 55.1 kDa protein F09G8.5 in chromosome III	NM_145309	220074	0.083158024
AGL_HUM1_OLIGO_A_24_P365954	THAP11	THAP domain containing 11	NM_020457	57215	0.083158024
AGL_HUM1_OLIGO_A_24_P406514	UBE2V2	Ubiquitin-conjugating enzyme E2 variant 2	NM_003350	7336	0.083158024
AGL_HUM1_OLIGO_A_24_P48862	SNAP29	Synaptosomal-associated protein, 29kDa	NM_004782	9342	0.083158024
AGL_HUM1_OLIGO_A_24_P598406	RBAK	RB-associated KRAB repressor	BC068459	57786	0.083158024
AGL_HUM1_OLIGO_A_24_P71700	KIAA1190	Hypothetical protein KIAA1190	NM_145166	92999	0.083158024
AGL_HUM1_OLIGO_A_24_P7470	CYP3A5	Cytochrome P450, family 3, subfamily A, polypeptide 5	A_24_P7470		
AGL_HUM1_OLIGO_A_24_P916916	SNX10	Sorting nexin 10	AF355801	1577	0.083158024
AGL_HUM1_OLIGO_A_32_P98109	HSPC128	HSPC128 protein	NM_013332	29887	0.083158024
AGL_HUM1_OLIGO_A_32_P120084	CBWD1	COBW domain containing 1	NM_014167	29080	0.083158024
AGL_HUM1_OLIGO_A_32_P35220	C15orf29	Chromosome 15 open reading frame 29	NM_172003	55871	0.083158024
AGL_HUM1_OLIGO_A_32_P58163	SVZ8	Synaptic vesicle glycoprotein 28	NM_024713	79768	0.083158024
AGL_HUM1_OLIGO_A_23_P100022	RGH	Regucalcin (senescence marker protein-30)	NM_014848	9899	0.083256971
AGL_HUM1_OLIGO_A_23_P114423	RGH	Regucalcin (senescence marker protein-30)	NM_004683	9104	0.083256971
AGL_HUM1_OLIGO_A_23_P119857	FBLN2	Fibulin 2	NM_001008237		
AGL_HUM1_OLIGO_A_23_P143981	CLIP	Cartilage intermediate layer protein, nucleotide pyrophosphohydrolase	NM_001004019	2199	0.083256971
AGL_HUM1_OLIGO_A_23_P151895	CYP2U1	Cytochrome P450, family 2, subfamily U, polypeptide 1	NM_003613	8483	0.083256971
AGL_HUM1_OLIGO_A_23_P155835	C9orf67	Chromosome 9 open reading frame 67	NM_183075	113612	0.083256971
AGL_HUM1_OLIGO_A_23_P157736	RPE8P	RPE-spndin	NM_032728	84814	0.083256971
AGL_HUM1_OLIGO_A_23_P170649	AK5	Adenylate kinase 5	NM_153225	157869	0.083256971
AGL_HUM1_OLIGO_A_23_P200015	MGP	Matrix Gla protein	NM_174858	26289	0.083256971
AGL_HUM1_OLIGO_A_23_P204286	POLR1B	Polymerase (RNA) I polypeptide B, 128kDa	NM_009000	4256	0.083256971
AGL_HUM1_OLIGO_A_23_P209987	C6orf33	Chromosome 6 open reading frame 33	NM_019014	84172	0.083256971
AGL_HUM1_OLIGO_A_23_P214281	TMEM28	Transmembrane protein 28	NM_133367	85315	0.083256971
AGL_HUM1_OLIGO_A_23_P22647	ZNF607	Zinc finger protein 607	NM_015686	27112	0.083256971
AGL_HUM1_OLIGO_A_23_P27810	EPOH	Erythropoietin receptor	NM_032689	84775	0.083256971
AGL_HUM1_OLIGO_A_23_P367899	KIAA1913	KIAA1913	NM_000121	2057	0.083256971
AGL_HUM1_OLIGO_A_23_P391906	MGC20255	Hypothetical protein MGC20255	BC044246	114801	0.083256971
AGL_HUM1_OLIGO_A_23_P398044	RAB11FIP5	RAB11 family interacting protein 5 (class 1)	NM_052848	90324	0.083256971
AGL_HUM1_OLIGO_A_23_P415006	PDGFRB	Platelet-derived growth factor receptor, beta-polypeptide	NM_015470	26056	0.083256971
AGL_HUM1_OLIGO_A_23_P421401	RASL11B	RAS-like, family 11, member B	NM_002609	5159	0.083256971
AGL_HUM1_OLIGO_A_23_P6738	ARNT2	Similar to Peptidylprolyl isomerase A, isoform 1	NM_023940	65997	0.083256971
AGL_HUM1_OLIGO_A_23_P76136	ARNT2	Similar to Peptidylprolyl isomerase A, isoform 1	AY358804	390299	0.083256971
AGL_HUM1_OLIGO_A_23_P76749	SIRT4	Aryl-hydrocarbon receptor nuclear translocator 2	NM_020692		
AGL_HUM1_OLIGO_A_23_P83579	DKFZP564B1023	Sirtuin (silent mating type information regulation 2 homolog) 4 (S. cerevisiae)	NM_014862	9915	0.083256971
AGL_HUM1_OLIGO_A_24_P156886	FLJ14566	Hypothetical protein DKFZP564B1023	NM_012240	23409	0.083256971
AGL_HUM1_OLIGO_A_24_P217330	GLR8	Hypothetical protein FLJ14566	NM_031306	83479	0.083256971
AGL_HUM1_OLIGO_A_24_P217489	TNFSF13	Glycine receptor, beta	NM_032806	84892	0.083256971
AGL_HUM1_OLIGO_A_24_P245298	LOC221442	Tumor necrosis factor (ligand) superfamily, member 12	NM_000824	2743	0.083256971
AGL_HUM1_OLIGO_A_24_P414719	LOC146346	Hypothetical protein LOC221442	NM_003809	8741	0.083256971
AGL_HUM1_OLIGO_A_24_P475556	LOC146346	Hypothetical protein LOC146346	AK002098	221442	0.083256971
AGL_HUM1_OLIGO_A_24_P720185	Similar to Gamma-glutamyltranspeptidase 1 precursor (Gamma-glutamyltransferase 1) (CD224 antigen)	Similar to Gamma-glutamyltranspeptidase 1 precursor (Gamma-glutamyltransferase 1) (CD224 antigen)	AK057359	146346	0.083256971
AGL_HUM1_OLIGO_A_24_P83848	FLJ14525		BC092421		
AGL_HUM1_OLIGO_A_32_P113887	RARA		M30474	440796	0.083256971
AGL_HUM1_OLIGO_A_32_P42574	DKFZP547K054		THC246900		
AGL_HUM1_OLIGO_A_32_P5251	C6orf64	Hypothetical protein FLJ14525	NM_032800	84886	0.083256971
AGL_HUM1_OLIGO_A_32_P6408	KIAA0859	Retinoic acid receptor, alpha	NM_000964	5914	0.083256971
AGL_HUM1_OLIGO_A_32_P64096	C14orf74	Hypothetical protein DKFZP547K054	AL390175	56974	0.083256971
AGL_HUM1_OLIGO_A_23_P19322			NM_001012981		
AGL_HUM1_OLIGO_A_23_P201672			NM_018322	55776	0.083256971
AGL_HUM1_OLIGO_A_23_P322704			NM_015935	51603	0.083597114
			NM_173607	283635	0.083597114

Table 1A - FDR for Change in Gene Expression Values Between Pre-and Post-Treatment Responders

Agilent Probe ID	Gene Symbol	Gene Name	Accession	Entrez Gene ID	FDR
AGL_HUM1_OLIGO_A_23_P403445	CGREF1	Cell growth regulator with EF hand domain 1	NM_006569	10669	0.083597114
AGL_HUM1_OLIGO_A_23_P82929	NOV	Nephroblastoma overexpressed gene	NM_002514	4856	0.083597114
AGL_HUM1_OLIGO_A_23_P89410	BECN1	Becn1 (coiled-coil, myosin-like BCL2 interacting protein)	NM_003766	8678	0.083597114
AGL_HUM1_OLIGO_A_24_P943613	TBC1D1	TBC1 (tre-2/USP6, BUB2, cdc16) domain family, member 1	NM_015173	23216	0.083597114
AGL_HUM1_OLIGO_A_32_P84009	CKLF5F4	Chemokine-like factor super family 4	NM_178818	146223	0.083597114
AGL_HUM1_OLIGO_A_24_P1096552	KIAA2002	KIAA2002 protein	AB082533	79834	0.083793896
AGL_HUM1_OLIGO_A_23_P50167	SLC39A6	Solute carrier family 39 (zinc transporter), member 6	NM_012319	25800	0.083837055
AGL_HUM1_OLIGO_A_23_P158231	ABPA2	Amyloid beta (A4) precursor protein-binding, family A, member 2 (X11-like)	NM_005503	321	0.085898602
AGL_HUM1_OLIGO_A_23_P201338	Cab45	Calcium binding protein Cab45 precursor	NM_016176	51150	0.085898602
AGL_HUM1_OLIGO_A_23_P209499	PAX3	Paired box gene 3 (Wardenburg syndrome 1)	NM_181458	5077	0.085898602
AGL_HUM1_OLIGO_A_23_P26534	HCCRC1R1	Host cell factor C1 regulator 1 (XPO1 dependant)	NM_017885	54965	0.085898602
AGL_HUM1_OLIGO_A_24_P931944	SCGF	CDNA FLJ25106 fis, clone CBR01467	AK128814	6320	0.086294408
AGL_HUM1_OLIGO_A_23_P153489	MAN1C1	Stem cell growth factor, lymphocyte secreted C-type lectin	NM_002975	57134	0.086334725
AGL_HUM1_OLIGO_A_23_P103601	ZHX2	Mannosidase, alpha, class IC, member 1	NM_020379	57134	0.08767326
AGL_HUM1_OLIGO_A_24_P316364	DKFZ566E144	Zinc fingers and homeoboxes 2	NM_014943	22882	0.08767326
AGL_HUM1_OLIGO_A_32_P170925	TRIM32	Small fragment nuclease	NM_015523	25996	0.08767326
AGL_HUM1_OLIGO_A_23_P112311	FUJ10597	Tripartite motif-containing 32	ENST0000036020:	22954	0.087758013
AGL_HUM1_OLIGO_A_23_P201002	SERPINA5	Hypothetical protein FLJ10597	NM_012210	55182	0.087758013
AGL_HUM1_OLIGO_A_23_P205355	MMP28	Matrix metalloproteinase, member 5	NM_006624	5104	0.087758013
AGL_HUM1_OLIGO_A_23_P26890	PSKH1	Protein serine kinase H1	NM_024302	79148	0.087758013
AGL_HUM1_OLIGO_A_24_P375132	SLC22A1	Solute carrier family 27 (fatty acid transporter), member 1	NM_006742	5681	0.087758013
AGL_HUM1_OLIGO_A_24_P382489	ZNF189	Zinc finger protein 189	A_24_P375132	376497	0.087758013
AGL_HUM1_OLIGO_A_24_P89872	ROR1	Receptor tyrosine kinase-like orphan receptor 1	NM_198580	7743	0.087758013
AGL_HUM1_OLIGO_A_23_P12363	FLJ10307	Hypothetical protein FLJ10307	NM_005012	4919	0.088567004
AGL_HUM1_OLIGO_A_23_P131887	CRYL1	Crystallin, lambda 1	U35612	55113	0.088567004
AGL_HUM1_OLIGO_A_23_P149496	STMN3	Stathmin-like 3	NM_018053	51084	0.088567004
AGL_HUM1_OLIGO_A_23_P162746	MLC1	Megakaryocytic leukoencephalopathy with subcortical cysts 1	NM_015974	50861	0.088567004
AGL_HUM1_OLIGO_A_23_P165927	FTHFSDC1	Formyltetrahydrofolate synthetase domain containing 1	NM_015894	23209	0.088567004
AGL_HUM1_OLIGO_A_23_P211680	HRB2	HIV-1 rev binding protein 2	NM_015166	25902	0.088567004
AGL_HUM1_OLIGO_A_23_P214908	HRBL	HIV-1 Rev binding protein-like	AY374131	11103	0.088567004
AGL_HUM1_OLIGO_A_23_P2216	PON2	Paraoxonase 2	NM_007043	11103	0.088567004
AGL_HUM1_OLIGO_A_23_P311640	CHDH	Choline dehydrogenase	NM_006076	3268	0.088567004
AGL_HUM1_OLIGO_A_23_P31399	SFRS5	Splicing factor, arginine/serine-rich 5	NM_000305	5445	0.088567004
AGL_HUM1_OLIGO_A_23_P337185	TUB	Tubby homolog (mouse)	NM_018397	55349	0.088567004
AGL_HUM1_OLIGO_A_23_P377819	LG3	Ligase III, DNA, ATP-dependent	NM_006925	6430	0.088567004
AGL_HUM1_OLIGO_A_23_P500992	ASPM	Asp (abnormal spindle)-like, microcephaly associated (Drosophila)	NM_003320	7275	0.088567004
AGL_HUM1_OLIGO_A_23_P501134	THTPA	Thiamine triphosphatase	NM_002311	3980	0.088567004
AGL_HUM1_OLIGO_A_23_P52017	CGI-90	CGI-90 protein	NM_018136	259266	0.088567004
AGL_HUM1_OLIGO_A_23_P54041	ELMO2	Engulfment and cell motility 2 (ced-12 homolog, C. elegans)	NM_018136	79178	0.088567004
AGL_HUM1_OLIGO_A_24_P240889	GBP3	Guanylate binding protein 3	NM_024328	51115	0.088567004
AGL_HUM1_OLIGO_A_24_P320877	SDOS	Hypothetical protein MGCI1275	BCD09463	63916	0.088567004
AGL_HUM1_OLIGO_A_24_P336728	TGOLN2	Trans-golgi network, protein 2	NM_182764	2635	0.088567004
AGL_HUM1_OLIGO_A_24_P370702	ATP2A2	Hypothetical gene supported by AK001829	NM_014873	84309	0.088567004
AGL_HUM1_OLIGO_A_24_P413985	FAM43B	ATPase, Ca++ transporting, cardiac muscle, slow twitch 2	NM_032349	10618	0.088567004
AGL_HUM1_OLIGO_A_24_P73290	TMEM34	Family with sequence similarity 43, member B	NM_006464	440498	0.088567004
AGL_HUM1_OLIGO_A_24_P76313		Homo sapiens, clone IMAGE:5277945, mRNA	AK001829	488	0.088567004
AGL_HUM1_OLIGO_A_24_P867201		Transmembrane protein 34	NM_001681	163933	0.088567004
AGL_HUM1_OLIGO_A_24_P94722			NM_207334	55751	0.088567004
			CR613944		0.088567004
			NM_018241		0.088567004

Table 1A - FDR for Change in Gene Expression Values Between Pre-and Post-Treatment Responders

Agilent Probe ID	Gene Symbol	Gene Name	Accession	Entrez Gene ID	FDR
AGI_HUM1_OLIGO_A_32_P108738	DKFZp761B107	Hypothetical protein DKFZp761B107	AK023472	91050	0.088567004
AGI_HUM1_OLIGO_A_32_P11372	Hypothetical protein FLJ30435	Hypothetical protein FLJ30435	NM_174950	387628	0.088567004
AGI_HUM1_OLIGO_A_32_P149967	Transcribed locus	Transcribed locus	BX105952		0.088567004
AGI_HUM1_OLIGO_A_32_P196142	MLPH	Melanophilin	THC2400010	79083	0.088567004
AGI_HUM1_OLIGO_A_23_P165778	KIAA1012	KIAA1012	NM_024101	22878	0.088567004
AGI_HUM1_OLIGO_A_23_P107552	MGIC3379	HSPC244	NM_014939	51259	0.088567004
AGI_HUM1_OLIGO_A_23_P203389	DKFZP5641102	DKFZP5641102 protein	NM_016499	25854	0.088567004
AGI_HUM1_OLIGO_A_23_P416965	IRS1	Insulin receptor substrate 1	NM_015398	3667	0.088567004
AGI_HUM1_OLIGO_A_24_P225679	CXCL12	Chemokine (C-X-C motif) ligand 12 (stromal cell-derived factor 1)	NM_005544	6387	0.088567004
AGI_HUM1_OLIGO_A_24_P944054	EIF3C1	Eukaryotic translation initiation factor 2C, 1	AK090482	26523	0.088567004
AGI_HUM1_OLIGO_A_23_P11764	MARVELD1	MARVEL domain containing 1	NM_012199	83742	0.088567004
AGI_HUM1_OLIGO_A_23_P138725	MDS025	Hypothetical protein MDS025	NM_031484	60492	0.088567004
AGI_HUM1_OLIGO_A_23_P139965	GMPR2	Guanosine monophosphate reductase 2	NM_001010897	51292	0.088567004
AGI_HUM1_OLIGO_A_24_P56467	DRG1	Developmentally regulated GTP binding protein 1	NM_021825	4733	0.088567004
AGI_HUM1_OLIGO_A_32_P222362	FLJ37440	Hypothetical protein FLJ37440	AK127132	129804	0.088567004
AGI_HUM1_OLIGO_A_23_P102462	PSEN2	Presenilin 2 (Alzheimer disease 4)	NM_153214	5664	0.088567004
AGI_HUM1_OLIGO_A_23_P103398	FLJ10036	Zwili	NM_000447	55055	0.088567004
AGI_HUM1_OLIGO_A_23_P112673	DNAID1	Dna1 (Hsp40) homolog, subfamily D, member 1	NM_017975	29103	0.088567004
AGI_HUM1_OLIGO_A_23_P117190	TFAP2C	Transcription factor AP-2 gamma (activating enhancer binding protein 2 gamma)	NM_003222	7022	0.088567004
AGI_HUM1_OLIGO_A_23_P120472	G22P1	Thyroid autoantigen 70kDa (Ku antigen)	NM_001469	2547	0.088567004
AGI_HUM1_OLIGO_A_23_P120942	SCY1	Small inducible cytokine subfamily E, member 1 (endothelial monocyte-activating)	NM_004757	9255	0.088567004
AGI_HUM1_OLIGO_A_23_P121686	KDELC1	KDEL (Lys-Asp-Glu-Leu) containing 1	NM_024089	79070	0.088567004
AGI_HUM1_OLIGO_A_23_P128613	DOK3	Docking protein 3	NM_024872	79930	0.088567004
AGI_HUM1_OLIGO_A_23_P133506	FLJ14451	Hypothetical protein FLJ14451	NM_032786	84872	0.088567004
AGI_HUM1_OLIGO_A_23_P139455	PTX1	PTX1 protein	NM_016570	51290	0.088567004
AGI_HUM1_OLIGO_A_23_P139509	RAB33A	RAB33A, member RAS oncogene family	NM_004794	9363	0.088567004
AGI_HUM1_OLIGO_A_23_P147025	BCORL1	BCL6 co-repressor-like 1	NM_021946	63035	0.088567004
AGI_HUM1_OLIGO_A_23_P147495	MGIC3234	Hypothetical protein MGIC3234	NM_023947	66005	0.088567004
AGI_HUM1_OLIGO_A_23_P147874	PCCR2	Pyroline-5-carboxylate reductase family, member 2	NM_013328	29920	0.088567004
AGI_HUM1_OLIGO_A_23_P149042	BSB1	Chromosome 14 open reading frame 132	NM_024649	582	0.088567004
AGI_HUM1_OLIGO_A_23_P150267	C14orf132	3-hydroxyisobutyryl-Coenzyme A hydrolase	NM_020215	56967	0.088567004
AGI_HUM1_OLIGO_A_23_P151529	HIBCH	High-mobility group box 2	NM_014362	26275	0.088567004
AGI_HUM1_OLIGO_A_23_P154349	HMG82	Protein phosphatase 1, regulatory subunit 10	NM_002129	3148	0.088567004
AGI_HUM1_OLIGO_A_23_P155765	PPP1R10	Eukaryotic translation elongation factor 1 epsilon 1	NM_002714	5514	0.088567004
AGI_HUM1_OLIGO_A_23_P156667	EEF1E1	Likely ortholog of chicken Tsukushi	NM_004280	9521	0.088567004
AGI_HUM1_OLIGO_A_23_P156842	TSK	Lysosomal-associated membrane protein 1	NM_015516	25987	0.088567004
AGI_HUM1_OLIGO_A_23_P162142	LAMP1	ARPS actin-related protein 5 homolog (yeast)	NM_005561	3916	0.088567004
AGI_HUM1_OLIGO_A_23_P162846	ACTR5	Ras association (RalGDS/AF-6) domain family 2	NM_024855	79913	0.088567004
AGI_HUM1_OLIGO_A_23_P165952	RASSF2	Hypothetical protein FLJ12057	NM_014737	9770	0.088567004
AGI_HUM1_OLIGO_A_23_P166087	FLJ12057	V-ra simian leukemia viral oncogene homolog A (ras related)	NM_024768	79825	0.088567004
AGI_HUM1_OLIGO_A_23_P165656	RALA	Ras-related GTP binding A	NM_005402	5898	0.088567004
AGI_HUM1_OLIGO_A_23_P168479	RAGA	Hypothetical protein FLJ14566	NM_006570	10670	0.088567004
AGI_HUM1_OLIGO_A_23_P169117	FLJ14566	Potassium large conductance calcium-activated channel, subfamily M, beta member 1	NM_032806	84892	0.088567004
AGI_HUM1_OLIGO_A_23_P18082	KCNMB1	Hypothetical protein FLJ20489	NM_004137	3779	0.088567004
AGI_HUM1_OLIGO_A_23_P19142	FLJ20489	Ankyrin repeat and SOCS box-containing 2	NM_017842	55652	0.088567004
AGI_HUM1_OLIGO_A_23_P204511	ASB2	Neuro-oncological ventral antigen 1	NM_016150	51676	0.088567004
AGI_HUM1_OLIGO_A_23_P205370	NOVA1	Adaptor-related protein complex 1, gamma 1 subunit	NM_002515	4857	0.088567004
AGI_HUM1_OLIGO_A_23_P205435	AP1G1		NM_001128	164	0.088567004
AGI_HUM1_OLIGO_A_23_P206788					

Table 1A - FDR for Change in Gene Expression Values Between Pre-and Post-Treatment Responders

Agilent Probe ID	Gene Symbol	Gene Name	Accession	Entrez Gene ID	FDR
AGL_HUM1_OLIGO_A_23_P207742	THRA	Thyroid hormone receptor, alpha (erythroblastic leukemia viral (v-erb-a) oncogene homolog, avian)	NM_003250	7067	0.090484176
AGL_HUM1_OLIGO_A_23_P207999	PMAP1	Phorbol-12-myristate-13-acetate-induced protein 1	NM_021127	5366	0.090484176
AGL_HUM1_OLIGO_A_23_P211631	FBLN1	Fibulin 1	NM_006486	2192	0.090484176
AGL_HUM1_OLIGO_A_23_P212213	THUMP3	THUMP domain containing 3	NM_015453	25917	0.090484176
AGL_HUM1_OLIGO_A_23_P24135	TACR2	Tachykinin receptor 2	NM_001057	6865	0.090484176
AGL_HUM1_OLIGO_A_23_P250102	FLJ13769	Hypothetical protein FLJ13769	ENST0000029598		0.090484176
AGL_HUM1_OLIGO_A_23_P25060	CRBN	Cerebrin	AK023831	80079	0.090484176
AGL_HUM1_OLIGO_A_23_P250930	LIAS	Lipoic acid synthetase	NM_016302	51185	0.090484176
AGL_HUM1_OLIGO_A_23_P254081	DEK	DEK oncogene (DNA binding)	NM_003472	11019	0.090484176
AGL_HUM1_OLIGO_A_23_P254702	ZNF319	Zinc finger protein 319	NM_020807	7913	0.090484176
AGL_HUM1_OLIGO_A_23_P26314	DKFZP564K1964	DKFZP564K1964 protein	NM_015544	57567	0.090484176
AGL_HUM1_OLIGO_A_23_P27035			NM_015544	26022	0.090484176
AGL_HUM1_OLIGO_A_23_P27584			NM_001020818		0.090484176
AGL_HUM1_OLIGO_A_23_P28263	CTDSP1	CTD (carboxy-terminal domain, RNA polymerase II, polypeptide A) small phosphatase 1	NM_021198	58190	0.090484176
AGL_HUM1_OLIGO_A_23_P30020	PLA2G12A	Phospholipase A2, group XIIA	NM_030821	81579	0.090484176
AGL_HUM1_OLIGO_A_23_P303763	ZNF79	Zinc finger protein 79 (p17)	NM_007135	7633	0.090484176
AGL_HUM1_OLIGO_A_23_P303833	SCN4B	Sodium channel, voltage-gated, type IV, beta	NM_174934	6330	0.090484176
AGL_HUM1_OLIGO_A_23_P310956	COL6A2	Collagen, type VI, alpha 2	NM_058175	1292	0.090484176
AGL_HUM1_OLIGO_A_23_P327426	MGC3794	Putative MAPK activating protein	NM_152902	261726	0.090484176
AGL_HUM1_OLIGO_A_23_P331908	PRDM11	PR domain containing 11	AK097878	56981	0.090484176
AGL_HUM1_OLIGO_A_23_P34402	NCSTN	Nicastrin	NM_015331	23385	0.090484176
AGL_HUM1_OLIGO_A_23_P345674	ZNF71	Zinc finger protein 71 (Cos26)	NM_021216	58491	0.090484176
AGL_HUM1_OLIGO_A_23_P350824	DPSL2	Dihydroxyrimidine-like 2	NM_001386	1808	0.090484176
AGL_HUM1_OLIGO_A_23_P352950	PNM45	Paraneoplastic antigen like 5	NM_052926	114824	0.090484176
AGL_HUM1_OLIGO_A_23_P35617	PLCE1	Phospholipase C, epsilon 1	NM_016341	51196	0.090484176
AGL_HUM1_OLIGO_A_23_P357936	ASTN2	Astroctactin 2	NM_014010	23245	0.090484176
AGL_HUM1_OLIGO_A_23_P360964	MGC15476	Thymus expressed gene 3-like	NM_145056	147906	0.090484176
AGL_HUM1_OLIGO_A_23_P360983	LOC91942	Hypothetical protein LOC91942	NM_174889	91942	0.090484176
AGL_HUM1_OLIGO_A_23_P364056			NM_001011724		0.090484176
AGL_HUM1_OLIGO_A_23_P369047			ENST0000032498		0.090484176
AGL_HUM1_OLIGO_A_23_P369994	DCAMKLT	Doublecortin and Cam kinase-like 1	NM_004734	9201	0.090484176
AGL_HUM1_OLIGO_A_23_P374288	CASC3	Cancer susceptibility candidate 3	NM_007359	22794	0.090484176
AGL_HUM1_OLIGO_A_23_P37505	DYX1C1	Dyslexia susceptibility 1 candidate 1	NM_130810	161582	0.090484176
AGL_HUM1_OLIGO_A_23_P37514	DKFZP434H132	DKFZP434H132 protein	BC011905	56905	0.090484176
AGL_HUM1_OLIGO_A_23_P387374	HSD17B1	Hydroxysteroid (17-beta) dehydrogenase 1	BC033110	3292	0.090484176
AGL_HUM1_OLIGO_A_23_P389907	ATXN2	Ataxin 2	NM_002973	6311	0.090484176
AGL_HUM1_OLIGO_A_23_P394216	KIAA0329	F-box protein 31	NM_014844	9895	0.090484176
AGL_HUM1_OLIGO_A_23_P395566	FBXO31	Leucine zipper protein 1	NM_024735	79798	0.090484176
AGL_HUM1_OLIGO_A_23_P407142	LUZP1	Ornithine decarboxylase antizyme 1	NM_033631	7798	0.090484176
AGL_HUM1_OLIGO_A_23_P41314	OA21	Guanine nucleotide binding protein (G protein), alpha z polypeptide	NM_004152	4946	0.090484176
AGL_HUM1_OLIGO_A_23_P41681	F11	Coagulation factor XI (plasma thromboplastin antecedent)	NM_000128	2160	0.090484176
AGL_HUM1_OLIGO_A_23_P42036	GNM2	Hypothetical protein d112208.2	NM_002073	2781	0.090484176
AGL_HUM1_OLIGO_A_23_P42042	D112208.2	Hypothetical protein d112208.2	NM_020466	57226	0.090484176
AGL_HUM1_OLIGO_A_23_P421638	KIAA1190	Hypothetical protein KIAA1190	NM_020466	57226	0.090484176
AGL_HUM1_OLIGO_A_23_P42975	PKRAR2B	Protein kinase, cAMP-dependent, regulatory, type II, beta	NM_002736	5577	0.090484176
AGL_HUM1_OLIGO_A_23_P43276	GPN124	G protein-coupled receptor 124	NM_032772	25960	0.090484176
AGL_HUM1_OLIGO_A_23_P43566	NDUFAB	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, 8, 19kDa	NM_014222	4702	0.090484176
AGL_HUM1_OLIGO_A_23_P44291	CRTAP	Cartilage associated protein	NM_006371	10491	0.090484176
AGL_HUM1_OLIGO_A_23_P48717	NPC2	Niemann-Pick disease, type C2	NM_006432	10577	0.090484176
AGL_HUM1_OLIGO_A_23_P53588	WNISB	Wingless-type MMTV integration site family, member 5B	NM_030775	81029	0.090484176
AGL_HUM1_OLIGO_A_23_P54576	KIFC3	Kinesin family member C3	NM_005550	3801	0.090484176

Table 1A - FDR for Change in Gene Expression Values Between Pre-and Post-Treatment Responders

Agilent Probe ID	Gene Symbol	Gene Name	Accession	Entrez Gene ID	FDR
AGL_HUM1_OLIGO_A_23_P5568	MGC5391	Hypothetical protein MGC5391	NM_032740	84826	0.090484176
AGL_HUM1_OLIGO_A_23_P60146	PGGFRL	Platelet-derived growth factor receptor-like	NM_006207	5157	0.090484176
AGL_HUM1_OLIGO_A_23_P61406	SHC3	Chromosome 9 open reading frame 33	NM_016848	53358	0.090484176
AGL_HUM1_OLIGO_A_23_P64489	RIC-8	Likely ortholog of mouse syembryn	NM_021932	60626	0.090484176
AGL_HUM1_OLIGO_A_23_P67360	PLEKHA4	Pleckstrin homology domain containing, family A (phosphoinositide binding specific) member 4	NM_020904	57664	0.090484176
AGL_HUM1_OLIGO_A_23_P69267	DKFZP564O243	DKFZP564O243 protein	NM_015407	25864	0.090484176
AGL_HUM1_OLIGO_A_23_P69497	TNA	Tetranectin (plasminogen binding protein)	NM_003278	7123	0.090484176
AGL_HUM1_OLIGO_A_23_P71091	GCCI1	GRP and coiled-coil domain containing 1	NM_024523	79571	0.090484176
AGL_HUM1_OLIGO_A_23_P7144	CXCL1	Chemokine (C-X-C motif) ligand 1 (melanoma growth stimulating activity, alpha)	NM_001511	2919	0.090484176
AGL_HUM1_OLIGO_A_23_P74349	CDC41	Cell division cycle associated 1	NM_145697	83540	0.090484176
AGL_HUM1_OLIGO_A_23_P82068	NOL7	Nucleolar protein 7, 27KDa	NM_016167	51406	0.090484176
AGL_HUM1_OLIGO_A_23_P8281	IFNGR1	Interferon gamma receptor 1	NM_000416	3459	0.090484176
AGL_HUM1_OLIGO_A_23_P84018	PPIC	Peptidylprolyl isomerase C (cyclophilin C)	NM_000943	5480	0.090484176
AGL_HUM1_OLIGO_A_23_P84070	HDCMA18P	HDCMA18P protein	NM_016648	51574	0.090484176
AGL_HUM1_OLIGO_A_23_P88559	LIPC	Lipase, hepatic	NM_000236	3990	0.090484176
AGL_HUM1_OLIGO_A_23_P9232	GCNT1	Glucosaminyl (N-acetyl) transferase 1, core 2 (beta-1,6-N-acetylglucosaminyltransferase)	NM_001490	2650	0.090484176
AGL_HUM1_OLIGO_A_24_P106624	BIRC3	Baculoviral IAP repeat-containing 3	NM_001165	330	0.090484176
AGL_HUM1_OLIGO_A_24_P115621	MEOX2	Mesenchyme homeo box 2 (growth arrest-specific homeo box)	NM_005924	4223	0.090484176
AGL_HUM1_OLIGO_A_24_P116535	MMP15	Matrix metalloproteinase 15 (membrane-inserted)	ENST00000373211		
AGL_HUM1_OLIGO_A_24_P12435	NCOA7	Nuclear receptor coactivator 7	NM_002428	4324	0.090484176
AGL_HUM1_OLIGO_A_24_P131522	ANTXR1	Anthrax toxin receptor 1	NM_181782	135112	0.090484176
AGL_HUM1_OLIGO_A_24_P143843	HILS1	Spermatid-specific linker histone H1-like protein	NM_032208	84168	0.090484176
AGL_HUM1_OLIGO_A_24_P144784			ENST00000342681		
AGL_HUM1_OLIGO_A_24_P148373			NM_194072	373861	0.090484176
AGL_HUM1_OLIGO_A_24_P149124	CSorf13	Chromosome 5 open reading frame 13	ENST00000374011		
AGL_HUM1_OLIGO_A_24_P163632	OXR1	Oxidation resistance 1	NM_004772	9315	0.090484176
AGL_HUM1_OLIGO_A_24_P167473	ARPC3	Actin related protein 2/3 complex, subunit 3, 21KDa	NM_181354	55074	0.090484176
AGL_HUM1_OLIGO_A_24_P17722	KIAA0676	KIAA0676 protein	NM_005719	10094	0.090484176
AGL_HUM1_OLIGO_A_24_P178273	PTK9	PTK9 protein tyrosine kinase 9	NM_198868	23061	0.090484176
AGL_HUM1_OLIGO_A_24_P195205	NUDT1	Nudix (nucleoside diphosphate linked moiety X)-type motif 1	NM_198974	5756	0.090484176
AGL_HUM1_OLIGO_A_24_P196774	FBNP1	Formin binding protein 1	ENST00000361421		
AGL_HUM1_OLIGO_A_24_P205130	CRSP6	Cofactor required for Sp1 transcriptional activation, subunit 6, 77KDa	BC014395	4521	0.090484176
AGL_HUM1_OLIGO_A_24_P218587	MGC4606	Hypothetical protein MGC4606	NM_004268	23048	0.090484176
AGL_HUM1_OLIGO_A_24_P234871	CSNK1A1	Casein kinase 1, alpha 1	NM_004516	9440	0.090484176
AGL_HUM1_OLIGO_A_24_P251899	LOC119710	Hypothetical protein BC009561	A_24_P234871	79447	0.090484176
AGL_HUM1_OLIGO_A_24_P252846			NM_001892	1452	0.090484176
AGL_HUM1_OLIGO_A_24_P264644			NM_138787	119710	0.090484176
AGL_HUM1_OLIGO_A_24_P281730	MGC42415	Hypothetical protein MGC42415	A_24_P264644		
AGL_HUM1_OLIGO_A_24_P298545	NOV	Nephroblastoma overexpressed gene	A_24_P281730	168417	0.090484176
AGL_HUM1_OLIGO_A_24_P29885	WBP4	WW domain binding protein 4 (formin binding protein 21)	NM_153363	4856	0.090484176
AGL_HUM1_OLIGO_A_24_P30670	PC4	Activated RNA polymerase II transcription cofactor 4	NM_002514	4856	0.090484176
AGL_HUM1_OLIGO_A_24_P320328			NM_007187	11193	0.090484176
AGL_HUM1_OLIGO_A_24_P32836	KIAA1970	KIAA1970 protein	NM_006713	10923	0.090484176
AGL_HUM1_OLIGO_A_24_P330668	KIAA1001	Arylsulfatase G	A_24_P32836		
AGL_HUM1_OLIGO_A_24_P339611	PDCD5	Programmed cell death 5	NM_019116	124454	0.090484176
AGL_HUM1_OLIGO_A_24_P340066	ELF4	E74-like factor 4 (ets domain transcription factor)	NM_014960	22901	0.090484176
AGL_HUM1_OLIGO_A_24_P345371	GOLPH3L	Golgi phosphoprotein 3-like	NM_004708	9141	0.090484176
AGL_HUM1_OLIGO_A_24_P346269			NM_001421	2000	0.090484176
			NM_018178	55204	0.090484176
			THC2342624		0.090484176

Table 1A - FDR for Change in Gene Expression Values Between Pre-and Post-Treatment Responders

Agilent Probe ID	Gene Symbol	Gene Name	Accession	Entrez Gene ID	FDR
AGL_HUM1_OLIGO_A_24_P348649	NDUFAT1	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, 1, 7, 5kDa	NM_004541	4694	0.090484176
AGL_HUM1_OLIGO_A_24_P351435	CRBN	Cereblon	NM_016302	51185	0.090484176
AGL_HUM1_OLIGO_A_24_P376391	PLXND1	Plexin D1	NM_015103	23129	0.090484176
AGL_HUM1_OLIGO_A_24_P378302	ITM2C	Integral membrane protein 2C	NM_001040150	81618	0.090484176
AGL_HUM1_OLIGO_A_24_P379820	PLEKHA4	Pleckstrin homology domain containing, family A (phosphoinositide binding specific) member 4	NM_020904	57664	0.090484176
AGL_HUM1_OLIGO_A_24_P408047	MAD2L1BP	MAD2L1 binding protein	NM_001003690	9587	0.090484176
AGL_HUM1_OLIGO_A_24_P41339		CDNA clone IMAGE:4796690, partial cds	BC030102		0.090484176
AGL_HUM1_OLIGO_A_24_P43588			ENST00000299756		0.090484176
AGL_HUM1_OLIGO_A_24_P478556			THC2270231		0.090484176
AGL_HUM1_OLIGO_A_24_P49597			ENST0000037919;		0.090484176
AGL_HUM1_OLIGO_A_24_P592591			NM_003247	7058	0.090484176
AGL_HUM1_OLIGO_A_24_P59607	THBS2	Thrombospondin 2	NM_000447	5664	0.090484176
AGL_HUM1_OLIGO_A_24_P605612	PSEN2	Presenilin 2 (Alzheimer disease 4)			0.090484176
AGL_HUM1_OLIGO_A_24_P62521		Dopachrome tautomerase (dopachrome delta-isomerase, tyrosine-related protein 2)	NM_001922	1638	0.090484176
AGL_HUM1_OLIGO_A_24_P68381	DCT		A_24_P6850		0.090484176
AGL_HUM1_OLIGO_A_24_P6850			NM_172217	3603	0.090484176
AGL_HUM1_OLIGO_A_24_P73599	IL16	Interleukin 16 (lymphocyte chemoattractant factor)	NM_198841	158293	0.090484176
AGL_HUM1_OLIGO_A_24_P832156	C9orf100S	Chromosome 9 open reading frame 10 opposite strand	NM_020215	56967	0.090484176
AGL_HUM1_OLIGO_A_24_P920447	C14orf132	Chromosome 14 open reading frame 132	NM_001406	1949	0.090484176
AGL_HUM1_OLIGO_A_24_P940006	EFNB3	Ephrin-B3	NM_001406		0.090484176
AGL_HUM1_OLIGO_A_32_P101860		Full-length cDNA clone CS0DC003YA14 of Neuroblastoma Cot 25-normalized of Homo sapiens (human)	AK127572		0.090484176
AGL_HUM1_OLIGO_A_32_P108722			A_32_P113404		0.090484176
AGL_HUM1_OLIGO_A_32_P113404	FAM43B	Family with sequence similarity 43, member B	NM_207334	163933	0.090484176
AGL_HUM1_OLIGO_A_32_P125338	PTPN2	Protein tyrosine phosphatase, non-receptor type 2	NM_080423	5771	0.090484176
AGL_HUM1_OLIGO_A_32_P1445					
AGL_HUM1_OLIGO_A_32_P150040		Full-length cDNA clone CS0DF003YF10 of Fetal brain of Homo sapiens (human)	CR606969		0.090484176
AGL_HUM1_OLIGO_A_32_P161432	CBWD1	COBW domain containing 1	NM_172003	55871	0.090484176
AGL_HUM1_OLIGO_A_32_P169131	ALG1	Asparagine-linked glycosylation 1 homolog (Yeast, beta-1,4-mannosyltransferase)	NM_019109	56052	0.090484176
AGL_HUM1_OLIGO_A_32_P172141	CDON	Cell adhesion molecule-related/down-regulated by oncogenes	NM_016952	50937	0.090484176
AGL_HUM1_OLIGO_A_32_P178099			EB386378		0.090484176
AGL_HUM1_OLIGO_A_32_P179676	TOB2	Transducer of ERBB2, 2	NM_016272	10766	0.090484176
AGL_HUM1_OLIGO_A_32_P188860	IL17RD	Interleukin 17 receptor D	AK125591	54756	0.090484176
AGL_HUM1_OLIGO_A_32_P229065			NM_001031800		0.090484176
AGL_HUM1_OLIGO_A_32_P53524			BC092429		0.090484176
AGL_HUM1_OLIGO_A_32_P59549	GFRAL	GDNF family receptor alpha 1	NM_145793	2674	0.090484176
AGL_HUM1_OLIGO_A_32_P65395			NM_209655		0.090484176
AGL_HUM1_OLIGO_A_32_P78285			NM_005746		0.090484176
AGL_HUM1_OLIGO_A_32_P79396			XM_938617		0.090484176
AGL_HUM1_OLIGO_A_32_P80089			ENST0000034606;		0.090484176
AGL_HUM1_OLIGO_A_32_P84707			THC308802		0.090484176
AGL_HUM1_OLIGO_A_32_P84846			NM_001005851	163131	0.090484176
AGL_HUM1_OLIGO_A_32_P94087			NM_001011538		0.090484176
AGL_HUM1_OLIGO_A_32_P99902			NM_144597	123207	0.090484176
AGL_HUM1_OLIGO_A_23_P110967	MGC29937	Hypothetical protein MGC29937	NM_052937	115294	0.090566641
AGL_HUM1_OLIGO_A_23_P208961	MUM1	Similar to hypothetical protein FLJ10883	NM_032853	84939	0.09076283
AGL_HUM1_OLIGO_A_23_P81103	SFRP2	Melanoma associated antigen (mutated) 1	NM_003013	6423	0.090875466
AGL_HUM1_OLIGO_A_23_P62997	TOPK	Secreted frizzled-related protein 2	NM_018492	55872	0.090875466
AGL_HUM1_OLIGO_A_23_P433820	THAP8	T-LAK cell-originated protein Kinase	NM_152658	199745	0.091250181
AGL_HUM1_OLIGO_A_24_P311694	MAM11	THAP domain containing 8	NM_014757	9794	0.091250181
		Mastermind-like 1 (Drosophila)			

Table 1A - FDR for Change in Gene Expression Values Between Pre-and Post-Treatment Responders

Agilent Probe ID	Gene Symbol	Gene Name	Accession	Entrez Gene ID	FDR
AGL_HUM1_OLIGO_A_24_P50829	TRPM7	Transient receptor potential cation channel, subfamily M, member 7	NM_017672	54822	0.091250181
AGL_HUM1_OLIGO_A_32_P101301	USP39	Ubiquitin specific protease 39	NM_006590	10713	0.091250181
AGL_HUM1_OLIGO_A_23_P100711	PMP22	Peripheral myelin protein 22	NM_000304	5376	0.091253805
AGL_HUM1_OLIGO_A_23_P145463	SLC35B3	Solute carrier family 35, member B3	NM_015948	51000	0.091522184
AGL_HUM1_OLIGO_A_23_P419624	BLCAP	Bladder cancer associated protein	NM_006698	10904	0.091522184
AGL_HUM1_OLIGO_A_23_P400794	SART1	Squamous cell carcinoma antigen recognised by T cells	ENST00000311631		0.092872595
AGL_HUM1_OLIGO_A_23_P868894	MTMR6	Myotubularin related protein 6	NM_005146	9092	0.092872595
AGL_HUM1_OLIGO_A_24_P419211	C11orf24	Chromosome 11 open reading frame 24	NM_004685	9107	0.092872595
AGL_HUM1_OLIGO_A_23_P12911	CGI-07	CGI-07 protein	NM_022338	53838	0.093105978
AGL_HUM1_OLIGO_A_23_P32861	HBE1	Hemoglobin, epsilon 1	NM_015938	51068	0.093105978
AGL_HUM1_OLIGO_A_23_P47665	ZNF436	Zinc finger protein 436	NM_005330	3046	0.093105978
AGL_HUM1_OLIGO_A_23_P51202	RPL34	Ribosomal protein L34	NM_030634	80818	0.093105978
AGL_HUM1_OLIGO_A_23_P7229	SMX10	Sorting nexin 10	NM_033625	6164	0.093105978
AGL_HUM1_OLIGO_A_23_P8513	MGC40499	Hypothetical protein MGC40499	NM_013322	29887	0.093105978
AGL_HUM1_OLIGO_A_23_P157038	COL6A1	Collagen, type VI, alpha 1	NM_152755	245812	0.093210689
AGL_HUM1_OLIGO_A_24_P246825	P2RX2	Purinergic receptor P2X, ligand-gated ion channel, 2	THC2295607		0.093210689
AGL_HUM1_OLIGO_A_23_P124003	FBXO17	F-box protein 17	NM_001848	1291	0.093210689
AGL_HUM1_OLIGO_A_23_P101871	HSPA1A	Heat shock 70Kda protein 1A	NM_170683	22953	0.093708677
AGL_HUM1_OLIGO_A_23_P111132	TMOD1	Tropomodulin 1	NM_024907	115290	0.093887665
AGL_HUM1_OLIGO_A_23_P114289	TMEM9	Transmembrane protein 9	NM_005345	3303	0.093887665
AGL_HUM1_OLIGO_A_23_P115356	AKR7A2	Aldo-keto reductase family 7, member A2 (afflatoxin aldehyde reductase)	NM_003275	7111	0.093887665
AGL_HUM1_OLIGO_A_23_P115460	RPL22	Ribosomal protein L22	NM_016456	252839	0.093887665
AGL_HUM1_OLIGO_A_23_P115922	EIF4EBP2	Eukaryotic translation initiation factor 4E binding protein 2	NM_003689	8574	0.093887665
AGL_HUM1_OLIGO_A_23_P117082	HEBP1	Heme binding protein 1	NM_000983	6146	0.093887665
AGL_HUM1_OLIGO_A_23_P117654	MYO5A	Myosin VA (heavy polypeptide 12, myoxin)	NM_004096	1979	0.093887665
AGL_HUM1_OLIGO_A_23_P118493	TOM11L	Target of myb1-like 1 (chicken)	NM_015987	50865	0.093887665
AGL_HUM1_OLIGO_A_23_P119562	DF	D component of complement (adipsin)	NM_000259	4644	0.093887665
AGL_HUM1_OLIGO_A_23_P120103	KCNK53	Potassium voltage-gated channel, delayed-rectifier, subfamily 5, member 3	NM_005486	10040	0.093887665
AGL_HUM1_OLIGO_A_23_P128956	ZFYVE1	Zinc finger, FYVE domain containing 1	NM_001928	1675	0.093887665
AGL_HUM1_OLIGO_A_23_P1331	COL13A1	Collagen, type XIII, alpha 1	NM_002252	3790	0.093887665
AGL_HUM1_OLIGO_A_23_P139476	CD63	CD63 antigen (melanoma 1 antigen)	NM_005203	53349	0.093887665
AGL_HUM1_OLIGO_A_23_P147514	DKFZp547E052	Hypothetical protein DKFZp547E052	NM_001780	1305	0.093887665
AGL_HUM1_OLIGO_A_23_P157051	AP4M1	Adaptor-related protein complex 4, mu 1 subunit	NM_001780	967	0.093887665
AGL_HUM1_OLIGO_A_23_P162795	SUGT1	SGT1, suppressor of G2 allele of SKP1 (S. cerevisiae)	BC062636	84226	0.093887665
		Sema domain, immunoglobulin domain (Ig), transmembrane domain (TM) and short cytoplasmic domain, (semaphorin) 4F	NM_004722	10910	0.093887665
		Par-3 partitioning defective 3 homolog (C. elegans)	NM_006704		
		Chromosome 21 open reading frame 91	NM_004263	10505	0.093887665
		Laminin, beta 2 (laminin 5)	AF196185	56288	0.093887665
		CD99 antigen-like 2	NM_017447	54149	0.093887665
		Retinoic acid induced 2	NM_002292	3913	0.093887665
		TaId DNase domain containing 1	NM_031462	83692	0.093887665
		MRNA, endogenous retrovirus	NM_021785	10742	0.093887665
		De-etiolated 1	NM_032026	83940	0.093887665
		Vesicle amine transport protein 1 homolog (T. californica)	BC021996	55070	0.093887665
		Vesicle-associated membrane protein 8 (endobrevin)	NM_017996	10493	0.093887665
		Mitogen-activated protein kinase kinase kinase 2	NM_006373	8673	0.093887665
		Hypothetical protein FLJ38984	NM_003761		
		Hypothetical protein MGC17839	ENST0000027358:		
		FK506 binding protein 9, 63 Kda	NM_006609	10746	0.093887665
		Histone acetyltransferase 1	NM_152374	127703	0.093887665
			NM_174926	219902	0.093887665
			NM_007270	11328	0.093887665
			NM_003642	8520	0.093887665

Table 1A - FDR for Change in Gene Expression Values Between Pre-and Post-Treatment Responders

Agilent Probe ID	Gene Symbol	Gene Name	Accession	Entrez Gene ID	FDR
AGL_HUM1_OLIGO_A_23_P324233	QPR1	Quinolinate phosphoribosyltransferase (nicotinate-nucleotide pyrophosphorylase (carboxylating))	NM_014298	23475	0.093887665
AGL_HUM1_OLIGO_A_23_P356004	CSEN	Calseinilin, presenilin binding protein, EF hand transcription factor	NM_013434	30818	0.093887665
AGL_HUM1_OLIGO_A_23_P391689	PCP2	Purkinje cell protein 2	CR602285	126006	0.093887665
AGL_HUM1_OLIGO_A_23_P401	CENPF	Centromere protein F, 350/400kDa (mitotin)	NM_016343	1063	0.093887665
AGL_HUM1_OLIGO_A_23_P402610	PFAS	Phosphoribosylformylglycinamidine synthase (FGAR amidotransferase)	NM_012393	5198	0.093887665
AGL_HUM1_OLIGO_A_23_P408996	OACT1	O-acetyltransferase (membrane bound) domain containing 1	AK131269	154141	0.093887665
AGL_HUM1_OLIGO_A_23_P411953	HOXB13	Pygopus homolog 2 (Drosophila)	NM_138300	907808	0.093887665
AGL_HUM1_OLIGO_A_23_P4212	MRCPRF	Homoio box B13	NM_006361	10481	0.093887665
AGL_HUM1_OLIGO_A_23_P432573	ECT2	MAS-related GPR, member F	NM_145015	219928	0.093887665
AGL_HUM1_OLIGO_A_23_P44684	D2LIC	Epithelial cell transforming sequence 2 oncogene	NM_018098	1894	0.093887665
AGL_HUM1_OLIGO_A_23_P502174		Dynein 2 light intermediate chain	NM_015522	51626	0.093887665
AGL_HUM1_OLIGO_A_23_P51346	PLVAP	Plasmalemma vesicle associated protein	ENST0000037657		0.093887665
AGL_HUM1_OLIGO_A_23_P56328	REL	V-rel reticulendotheliosis viral oncogene homolog (avian)	NM_031310	83483	0.093887665
AGL_HUM1_OLIGO_A_23_P56938	PC4	Activated RNA polymerase II transcription cofactor 4	NM_002908	5966	0.093887665
AGL_HUM1_OLIGO_A_23_P59921	RIP	RPA interacting protein	NM_006713	10923	0.093887665
AGL_HUM1_OLIGO_A_23_P6766	SIAM2	Seven in absentia homolog 2 (Drosophila)	NM_032308	84268	0.093887665
AGL_HUM1_OLIGO_A_23_P69121	NPEPPS	Aminopeptidase puromycin sensitive	NM_005067	6478	0.093887665
AGL_HUM1_OLIGO_A_23_P84836	HSPC148	Hypothetical protein HSPC148	NM_006310	9520	0.093887665
AGL_HUM1_OLIGO_A_23_P98218	MGC13138	Hypothetical protein MGC13138	NM_016403	51503	0.093887665
AGL_HUM1_OLIGO_A_24_P121631			NM_033410	92595	0.093887665
AGL_HUM1_OLIGO_A_24_P123658	FLJ30707	Hypothetical protein FLJ30707	ENST0000037287		0.093887665
AGL_HUM1_OLIGO_A_24_P150428	VPS29	Vacuolar protein sorting 29 (Yeast)	NM_145019	220108	0.093887665
AGL_HUM1_OLIGO_A_24_P175989	C10orf86	Chromosome 10 open reading frame 86	NM_057180	51699	0.093887665
AGL_HUM1_OLIGO_A_24_P189458			NM_017615	54780	0.093887665
AGL_HUM1_OLIGO_A_24_P191067			NM_001009566		0.093887665
AGL_HUM1_OLIGO_A_24_P200427	PAICS	Phosphoribosylaminoimidazole carboxylase, phosphoribosylaminoimidazole succinocarboxamide synthetase	NM_006452	10606	0.093887665
AGL_HUM1_OLIGO_A_24_P203479	MSH3	MuS homolog 3 (E. coli)	NM_002439	4437	0.093887665
AGL_HUM1_OLIGO_A_24_P213487	LAT1-3TM	LAT1-3TM protein	AF271775	81893	0.093887665
AGL_HUM1_OLIGO_A_24_P229728	CD52	CDP-diacylglycerol synthase (phosphatidate cytidyltransferase) 2	A_24_P229728		0.093887665
AGL_HUM1_OLIGO_A_24_P271363	GMFR	Guanosine monophosphate reductase	NM_003818	8760	0.093887665
AGL_HUM1_OLIGO_A_24_P27657	HIP2	Huntingtin interacting protein 2	NM_006877	2766	0.093887665
AGL_HUM1_OLIGO_A_24_P281395	FLJ10781	Hypothetical protein FLJ10781	ENST00000372281		0.093887665
AGL_HUM1_OLIGO_A_24_P286013	THAP8	THAP domain containing 8	NM_005339	3093	0.093887665
AGL_HUM1_OLIGO_A_24_P296808			NM_018215	55228	0.093887665
AGL_HUM1_OLIGO_A_24_P296907			NM_152658	199745	0.093887665
AGL_HUM1_OLIGO_A_24_P341426			A_24_P341426		0.093887665
AGL_HUM1_OLIGO_A_24_P409420			A_24_P409420		0.093887665
AGL_HUM1_OLIGO_A_24_P466374	ETV3	Eyes absent homolog 3 (Drosophila)	BX648945	2140	0.093887665
AGL_HUM1_OLIGO_A_24_P48177	SLIT4B	Slit/transferase 4B (beta-galactoside alpha-2,3-sialyltransferase)	AK127322	6483	0.093887665
AGL_HUM1_OLIGO_A_24_P511877	NEED4L	CDNA FLJ46881 fls, clone UTERU3015647, moderately similar to Embigin precursor	AK128714		0.093887665
AGL_HUM1_OLIGO_A_24_P782308		Neural precursor cell expressed, developmentally down-regulated 4-like	CR596491	23327	0.093887665
AGL_HUM1_OLIGO_A_24_P844100	ADG7L	ADG7 autophagy 7-like (S. cerevisiae)	A_24_P844100		0.093887665
AGL_HUM1_OLIGO_A_24_P944827	TAX1BP1	Tax1 (human T-cell leukemia virus type 1) binding protein 1	AL122075	10533	0.093887665
AGL_HUM1_OLIGO_A_24_P95029			NM_006024	8887	0.093887665
AGL_HUM1_OLIGO_A_32_P112279			NM_001039690		0.093887665
AGL_HUM1_OLIGO_A_32_P116058			NR_002800		0.093887665
AGL_HUM1_OLIGO_A_32_P116203	NCF1	Neutrophil cytosolic factor 1 (47kDa, chronic granulomatous disease, autosomal 1)	NM_000265	4687	0.093887665
AGL_HUM1_OLIGO_A_32_P163469	NFE2L1	Nuclear factor (erythroid-derived 2)-like 1	AL833530	4779	0.093887665
AGL_HUM1_OLIGO_A_32_P171232			A_32_P171232		0.093887665
AGL_HUM1_OLIGO_A_32_P184367	RPL10	Ribosomal protein L10	NM_006013	6134	0.093887665

Table 1A - FDR for Change in Gene Expression Values Between Pre-and Post-Treatment Responders

Agilent Probe ID	Gene Symbol	Gene Name	Accession	Entrez Gene ID	FDR
AGI_HUM1_OLIGO_A_32_P225355	CPEB2	Cytoplasmic polyadenylation element binding protein 2	NM_182485	132864	0.093887665
AGI_HUM1_OLIGO_A_32_P230736	PC4	Hypothetical LOC389033	NM_374010	389033	0.093887665
AGI_HUM1_OLIGO_A_32_P2333	FLJ4670	Activated RNA polymerase II transcription cofactor 4	NM_006713	10923	0.093887665
AGI_HUM1_OLIGO_A_32_P32179	LOC255458	FLJ4670 protein	AK057056	375096	0.093887665
AGI_HUM1_OLIGO_A_32_P32722		Hypothetical protein LOC255458	CR603845	253458	0.093887665
AGI_HUM1_OLIGO_A_32_P460399		MRNA full length insert cDNA clone EUROIMAGE 2362292	AL365520		0.093887665
AGI_HUM1_OLIGO_A_32_P58215	HEY1	Hairy/enhancer-of-split related with YRPW motif 1	ENST0000036805+		0.093887665
AGI_HUM1_OLIGO_A_32_P6442	LOC388272	Similar to RIKEN cDNA 4921524j17	THC406192	23462	0.093887665
AGI_HUM1_OLIGO_A_32_P83845	MAD2L1	MAD2 mitotic arrest deficient-like 1 (yeast)	NM_012258	388272	0.093887665
AGI_HUM1_OLIGO_A_23_P49279	MAN1C1	Mannosidase, alpha, class 1C, member 1	NM_001001436	388272	0.093920232
AGI_HUM1_OLIGO_A_23_P78134			NM_001014764	4085	0.093920232
AGI_HUM1_OLIGO_A_23_P92441			NM_002358	57134	0.093920232
AGI_HUM1_OLIGO_A_24_P237778			NM_020379		0.093920232
AGI_HUM1_OLIGO_A_24_P358205	MGCS508	Hypothetical protein MGCS508	A_24_P358205		0.093920232
AGI_HUM1_OLIGO_A_24_P47467	PDCL	Phosducin-like	NM_024092	79073	0.093920232
AGI_HUM1_OLIGO_A_23_P216949	TANK	TRAF family member-associated NFKB activator	NM_005388	5082	0.094362947
AGI_HUM1_OLIGO_A_23_P154306	BASP1	Brain abundant, membrane attached signal protein 1	NM_004180	10010	0.095027623
AGI_HUM1_OLIGO_A_23_P213385	REPS2	RALBP1 associated Eps domain containing 2	NM_006317	10409	0.095027623
AGI_HUM1_OLIGO_A_23_P251387	MLF1P	MLF1 interacting protein	NM_004726	9185	0.095027623
AGI_HUM1_OLIGO_A_23_P254733	RPL23A	Ribosomal protein L23a	NM_024629	79682	0.095027623
AGI_HUM1_OLIGO_A_23_P29747	CHCHD1	Coiled-coil-helix-coiled-coil-helix domain containing 1	NM_000984	6147	0.095027623
AGI_HUM1_OLIGO_A_23_P371613	CL6orf34	Chromosome 16 open reading frame 34	NM_203298	118487	0.095027623
AGI_HUM1_OLIGO_A_23_P434900	PFAP5	Phosphonofornate immuno-associated protein 5	NM_144570	90861	0.095027623
AGI_HUM1_OLIGO_A_23_P65262	OSR2	Odd-skipped related 2 (Drosophila)	NM_033111	10443	0.095027623
AGI_HUM1_OLIGO_A_23_P71570			NM_053001	116039	0.095027623
AGI_HUM1_OLIGO_A_24_P125311	FMN2	Formin 2	A_24_P125311		0.095027623
AGI_HUM1_OLIGO_A_24_P15765	ZFVIE1	Zinc finger, FYVE domain containing 1	AK098605	56776	0.095027623
AGI_HUM1_OLIGO_A_24_P287503	TAZF2	TAZF2 RNA polymerase II, TATA box binding protein (TBP)-associated factor, 150kDa	NM_021260	53349	0.095027623
AGI_HUM1_OLIGO_A_24_P385119			NM_003184	6873	0.095027623
AGI_HUM1_OLIGO_A_24_P58899	ZNF592	CDNA FLJ30141 fs, clone BRACE2000148	A_24_P58899		0.095027623
AGI_HUM1_OLIGO_A_24_P943843	MGCS4796	Zinc finger protein 592	AK124515	9640	0.095027623
AGI_HUM1_OLIGO_A_32_P113193	NDUFAB1	SPR pseudogene	NM_014630	414927	0.095027623
AGI_HUM1_OLIGO_A_32_P141445	LYPLA1	NADH dehydrogenase (ubiquinone) 1, alpha/beta subcomplex, 1, 8kDa	BC034822	4706	0.095027623
AGI_HUM1_OLIGO_A_23_P140960	WBSGR21	Lysophospholipase 1	NM_005003	10434	0.095262298
AGI_HUM1_OLIGO_A_23_P214091	KNTC2	Williams Beuren syndrome chromosome region 21	NM_006330	83451	0.095262298
AGI_HUM1_OLIGO_A_23_P315933	LXN	Kinetochores associated 2	NM_031295	83451	0.095262298
AGI_HUM1_OLIGO_A_23_P50108	MLYCD	Latexin	NM_006101	10403	0.095262298
AGI_HUM1_OLIGO_A_23_P6674	PARVA	Malonyl-CoA decarboxylase	NM_020169	56925	0.095262298
AGI_HUM1_OLIGO_A_23_P88810	SOX4	Parvin, alpha	NM_018222	23417	0.095262298
AGI_HUM1_OLIGO_A_24_P124370	FLJ35767	SRY (sex determining region Y)-box 4	NM_012213	55742	0.095262298
AGI_HUM1_OLIGO_A_23_P375165	FLJ20989	FLJ35767 protein	NM_018222	6659	0.095262298
AGI_HUM1_OLIGO_A_23_P170887	KIAA0406	Hypothetical protein FLJ20989	AW946823	400629	0.095338015
AGI_HUM1_OLIGO_A_23_P202219	BIRC4	KIAA0406 gene product	NM_207459	400629	0.095338015
AGI_HUM1_OLIGO_A_23_P22460	SUSD3	Family with sequence similarity 26, member B	NM_023080	65265	0.095338395
AGI_HUM1_OLIGO_A_23_P401076	LGALS8	Baculoviral IAP repeat-containing 4	NM_014657	9675	0.095338395
AGI_HUM1_OLIGO_A_23_P63026	PRAF2	Sushi domain containing 3	NM_015916	51063	0.095338395
AGI_HUM1_OLIGO_A_23_P96350		Lectin, galactoside-binding, soluble, 8 (galactin 8)	NM_001167	331	0.095338395
		PRA1 domain family, member 2	NM_145006	203328	0.095338395
		MADS box transcription enhancer factor 2, polypeptide B (myocyte enhancer factor 2B)	NM_006499	3964	0.095338395
AGI_HUM1_OLIGO_A_24_P282013	MEF2B		NM_007213	11230	0.095338395
AGI_HUM1_OLIGO_A_24_P943000	POP1	Processing of precursor 1, ribonuclease P/MRP subunit (S. cerevisiae)	AK057161	4207	0.095338395
AGI_HUM1_OLIGO_A_23_P154037	AOX1	Aldehyde oxidase 1	D31765	10940	0.095338395
			NM_001159	316	0.09565787

Table 1A - FDR for Change in Gene Expression Values Between Pre-and Post-Treatment Responders

Agilent Probe ID	Gene Symbol	Gene Name	Accession	Entrez Gene ID	FDR
AGL_HUM1_OLIGO_A_23_P334282	BMP2K	BMP2 inducible kinase	NM_017593	55589	0.095822416
AGL_HUM1_OLIGO_A_23_P38864	RABAC1	Rab acceptor 1 (prenylated)	NM_006423	10567	0.095822416
AGL_HUM1_OLIGO_A_23_P81898	UBD	Ubiquitin D	NM_006398	10537	0.095822416
AGL_HUM1_OLIGO_A_24_P196592	MMP28	Matrix metalloproteinase 28	NM_024302	79148	0.095866261
AGL_HUM1_OLIGO_A_32_P116113	DIO2	Deiodinase, iodothyronine, type II	CN479762	1734	0.095866261
AGL_HUM1_OLIGO_A_24_P349547			A_24_P349547		0.096048224
AGL_HUM1_OLIGO_A_23_P309619	PLEKHM1	Pleckstrin homology domain containing, family M (with RUN domain) member 1	AK123704	9842	0.096145456
AGL_HUM1_OLIGO_A_23_P396858	FZD8	Frizzled homolog 8 (Drosophila)	NM_031866	8325	0.096145456
AGL_HUM1_OLIGO_A_23_P399169	HIC1	Hypermethylated in cancer 1	NM_006497	3090	0.096145456
AGL_HUM1_OLIGO_A_23_P58117	ShrmL	Shroom-related protein	NM_020859	57619	0.096145456
AGL_HUM1_OLIGO_A_23_P88470	TRPM7	Transient receptor potential cation channel, subfamily M, member 7	NM_017672	54822	0.096145456
AGL_HUM1_OLIGO_A_24_P344961	AMOT	Angiomotin	NM_133265	154796	0.096145456
AGL_HUM1_OLIGO_A_23_P140654			THC237598		0.096332895
AGL_HUM1_OLIGO_A_23_P148629	EIF1AY	Eukaryotic translation initiation factor 1A, Y-linked	NM_004681	9086	0.096332895
AGL_HUM1_OLIGO_A_23_P163306	CGNLI1	Cingulin-like 1	NM_032866	84952	0.096332895
AGL_HUM1_OLIGO_A_23_P168167	C6orf168	Chromosome 6 open reading frame 168	NM_032511	84553	0.096332895
AGL_HUM1_OLIGO_A_23_P18317	SLC41A3	Solute carrier family 41, member 3	NM_017836	54946	0.096332895
AGL_HUM1_OLIGO_A_23_P212196	OGG1	8-oxoguanine DNA glycosylase	NM_016628	4968	0.096332895
AGL_HUM1_OLIGO_A_23_P212535	DKFZP564O123	DKFZP564O123 protein	NM_014043	25978	0.096332895
AGL_HUM1_OLIGO_A_23_P217049	FREQ	Frequenin homolog (Drosophila)	NM_014286	23413	0.096332895
AGL_HUM1_OLIGO_A_23_P217498	GDPD2	Glycerophosphodiester phosphodiesterase domain containing 2	NM_017711	54857	0.096332895
AGL_HUM1_OLIGO_A_23_P301855	LSAMP	Limbic system-associated membrane protein	NM_002338	4045	0.096332895
AGL_HUM1_OLIGO_A_23_P31315	CBX3	Chromobox homolog 3 (HP1 gamma homolog, Drosophila)	NM_016587	11335	0.096332895
AGL_HUM1_OLIGO_A_23_P325924			ENST00000288671		0.096332895
AGL_HUM1_OLIGO_A_23_P36183	GTF2H1	General transcription factor IIH, polypeptide 1, 62kDa	NM_005316	2965	0.096332895
AGL_HUM1_OLIGO_A_23_P421011	KAZALD1	Kazal-type serine protease inhibitor domain 1	NM_030929	81621	0.096332895
AGL_HUM1_OLIGO_A_23_P500773	MAD3K7	Mitogen-activated protein kinase kinase 7	NM_003188	6885	0.096332895
AGL_HUM1_OLIGO_A_23_P9192	ROD1	ROD1 regulator of differentiation 1 (S. pombe)	NM_005156	9991	0.096332895
AGL_HUM1_OLIGO_A_24_P124992	PSMA4	Proteasome (prosome, macropain) subunit, alpha type, 4	NM_002789	5685	0.096332895
AGL_HUM1_OLIGO_A_24_P186746			A_24_P186746		0.096332895
AGL_HUM1_OLIGO_A_24_P203827			ENST00000310344		0.096332895
AGL_HUM1_OLIGO_A_24_P307065			NM_001001661		0.096332895
AGL_HUM1_OLIGO_A_24_P313397			NM_017425	155054	0.096332895
AGL_HUM1_OLIGO_A_24_P941166	ZNF425	Zinc finger protein 425	NM_017425	53340	0.096604616
AGL_HUM1_OLIGO_A_23_P104876	SPA17	Sperm autoantigenic protein 17	NM_003573	8425	0.096604616
AGL_HUM1_OLIGO_A_23_P141946	LTBP4	Latent transforming growth factor beta binding protein 4	NM_030811	64949	0.096604616
AGL_HUM1_OLIGO_A_23_P252536	MRS526	Mitochondrial ribosomal protein S26	NM_005767	10161	0.096604616
AGL_HUM1_OLIGO_A_23_P2705	P2RY5	Purinergic receptor P2Y, G-protein coupled, 5	NM_003083	6618	0.096604616
AGL_HUM1_OLIGO_A_23_P67228	SNAPC2	Small nuclear RNA activating complex, polypeptide 2, 45kDa	CR621710	84910	0.096604616
AGL_HUM1_OLIGO_A_23_P91076	FLJ14681	Hypothetical protein FLJ14681	NM_004287	9570	0.096604616
AGL_HUM1_OLIGO_A_24_P108242	GOSR2	Golgi SNAP receptor complex member 2	NM_004286	9567	0.096604616
AGL_HUM1_OLIGO_A_24_P168760	GTPBP1	GTP binding protein 1	ENST00000238616		0.096604616
AGL_HUM1_OLIGO_A_24_P912058			S76980		0.096604616
AGL_HUM1_OLIGO_A_32_P31633	SF3B1	Splicing factor 3b, subunit 1, 155kDa	NM_012433	23451	0.096604616
AGL_HUM1_OLIGO_A_23_P30474	FLJ10233	Hypothetical protein FLJ10233	NM_018034	55100	0.09712464
AGL_HUM1_OLIGO_A_32_P178092	AFAP	Hypothetical protein LOC554848	BC014113	60312	0.09745375
AGL_HUM1_OLIGO_A_23_P134714	HRSPI2	Heat-responsive protein 12	NM_005836	10247	0.09762118
AGL_HUM1_OLIGO_A_32_P175098	ASPH	Aspartate beta-hydroxylase	CR613736	444	0.09762118
AGL_HUM1_OLIGO_A_23_P252145	C1GALT1	galactosyltransferase	NM_020156	56913	0.097940226
AGL_HUM1_OLIGO_A_23_P104692	MGC35521	Pellino 3 alpha	NM_145065	246330	0.098033415
AGL_HUM1_OLIGO_A_23_P136238	MGC14327	Hypothetical protein MGC14327	NM_053045	94107	0.098033415
AGL_HUM1_OLIGO_A_23_P148879	ATP1A2	ATPase, Na+/K+ transporting, alpha 2 (+) polypeptide	NM_000702	477	0.098033415

Table 1A - FDR for Change in Gene Expression Values Between Pre-and Post-Treatment Responders

Agilent Probe ID	Gene Symbol	Gene Name	Accession	Entrez Gene ID	FDR
AGL_HUM1_OLIGO_A_23_P157147	ZDHHC4	Zinc finger, DHHC domain containing 4	NM_018106	55146	0.098033415
AGL_HUM1_OLIGO_A_23_P313512	DCP1B	Decapping enzyme hDcp1b	NM_152640	196513	0.098033415
AGL_HUM1_OLIGO_A_23_P336859	LOC284542	Hypothetical protein LOC284542	AK090467	284542	0.098033415
AGL_HUM1_OLIGO_A_23_P383009	IGFBP5	Insulin-like growth factor binding protein 5	NM_000599	3488	0.098033415
AGL_HUM1_OLIGO_A_23_P5051	GNAI1	Guanine nucleotide binding protein (G protein), alpha 11 (Gq class)	BC063426	2767	0.098033415
AGL_HUM1_OLIGO_A_24_P624439			NM_001013672		0.098033415
AGL_HUM1_OLIGO_A_32_P125568			THC2416690		0.098033415
AGL_HUM1_OLIGO_A_32_P161681			NM_001008528		0.098033415
AGL_HUM1_OLIGO_A_32_P184746			THC2378401		0.098033415
AGL_HUM1_OLIGO_A_32_P220127	RP134	Ribosomal protein L34	NM_033625	6164	0.098033415
AGL_HUM1_OLIGO_A_23_P114144	Cxorf37	Chromosome X open reading frame 37	NM_014008	28952	0.09816416
AGL_HUM1_OLIGO_A_23_P147185	CANX	Calnexin	NM_001746	821	0.09816416
AGL_HUM1_OLIGO_A_23_P213551	CSNK1A1	Casein kinase 1, alpha 1	NM_001892	1452	0.09816416
AGL_HUM1_OLIGO_A_24_P40165	PIGT	Phosphatidylinositol glycan, class T	NM_015937	51604	0.09816416
AGL_HUM1_OLIGO_A_24_P621023			ENST00000373816		0.09816416
AGL_HUM1_OLIGO_A_32_P10633	C22orf4	Chromosome 22 open reading frame 4	BC022417	25771	0.09816416
AGL_HUM1_OLIGO_A_23_P93722	SDK1	Sidekick homolog 1 (chicken)	AK074077	221935	0.098210685
AGL_HUM1_OLIGO_A_23_P48835	KIF23	Kinesin family member 23	NM_138555	9493	0.098273168
AGL_HUM1_OLIGO_A_23_P129301	C15orf25	Chromosome 15 open reading frame 25	NM_018097	55142	0.098500774
AGL_HUM1_OLIGO_A_23_P162739	TGFB14	Transforming growth factor beta 1 induced transcript 4	NM_183422	8848	0.098500774
AGL_HUM1_OLIGO_A_32_P165713	C1P29	Cytokine induced protein 29 kDa	NM_033082	84324	0.098500774
AGL_HUM1_OLIGO_A_32_P2738	C10orf61	Chromosome 10 open reading frame 61	NM_015631	26123	0.098500774
AGL_HUM1_OLIGO_A_23_P155477	LOC51161	G20 protein	NM_016210	51161	0.099065131
AGL_HUM1_OLIGO_A_23_P164081	MYH10	Myosin, heavy polypeptide 10, non-muscle	NM_005964	4628	0.099065131
AGL_HUM1_OLIGO_A_23_P34591			NM_033446		0.099065131
AGL_HUM1_OLIGO_A_23_P43484	CDKN2A	Cyclin-dependent kinase inhibitor 2A (melanoma, p16, inhibits CDK4)	NM_058197	1029	0.099065131
AGL_HUM1_OLIGO_A_24_P195974			A_24_P195974		0.099131448
AGL_HUM1_OLIGO_A_24_P269398	CASP2	Caspase 2, apoptosis-related cysteine protease (neural precursor cell expressed, developmentally down-regulated 2)	NM_032982	835	0.099131448
AGL_HUM1_OLIGO_A_32_P73775	KIAA0495	KIAA0495	NM_207306	57212	0.099131448
AGL_HUM1_OLIGO_A_32_P168561			THC2413666		0.099301528
AGL_HUM1_OLIGO_A_23_P140301	PSMA3	Proteasome (prosome, macropain) subunit, alpha type, 3	NM_002788	5684	0.099409858
AGL_HUM1_OLIGO_A_23_P140668	IDH3A	Isoctrate dehydrogenase 3 (NAD+) alpha	NM_005530	3419	0.099409858
AGL_HUM1_OLIGO_A_23_P163148	C14orf133	Chromosome 14 open reading frame 133	NM_022067	63894	0.099409858
AGL_HUM1_OLIGO_A_23_P219223			NM_080701		0.099409858
AGL_HUM1_OLIGO_A_23_P23266			ENST00000367801		0.099409858
AGL_HUM1_OLIGO_A_23_P55045	SLOC25A19	Solute carrier family 25 (mitochondrial deoxynucleotide carrier), member 19	NM_021734	60386	0.099409858
AGL_HUM1_OLIGO_A_23_P87752	LEPREL2	Leprecan-like 2	NM_014262	10536	0.099409858
AGL_HUM1_OLIGO_A_24_P175612	SFN2	Sideroflexin 2	NM_178858	118980	0.099409858
AGL_HUM1_OLIGO_A_23_P20864	ANGPTL2	Angiotensin-like 2	NM_012098	23452	0.099636713
AGL_HUM1_OLIGO_A_24_P220485	OLFML2A	Orfamide-like 2A	NM_182487	169611	0.099636713
AGL_HUM1_OLIGO_A_23_P125423	CIR	Complement component 1, r subcomponent	NM_001733	715	0.09983113
AGL_HUM1_OLIGO_A_23_P83493	CGI-90	CGI-90 protein	NM_016033	51115	0.09983113

Table 2 - FDR for Comparison of Baseline Arm and Back Samples Between Responders and Non-Responders

Agilent Probe ID	Gene Symbol	Gene Name	Accession	Entrez Gene ID	FDR
AGL_HUM1_OLIGO_A_23_P500410	ATP6V1G2	ATPase, H+ transporting, lysosomal 13kDa, V1 subunit G isoform 2	NM_130463	534	0.00556686
AGL_HUM1_OLIGO_A_23_P250313	KIAA1524	KIAA1524 protein	AB040957	57650	0.00592933
AGL_HUM1_OLIGO_A_23_P18267	TUSC4	Tumor suppressor candidate 4	NM_006545	10641	0.00611253
AGL_HUM1_OLIGO_A_24_P93741	LOC285398	Hypothetical protein LOC285398	AK098811	285398	0.00611253
AGL_HUM1_OLIGO_A_23_P352684	WDR22	WD repeat domain 22	NM_003861	8816	0.00611253
AGL_HUM1_OLIGO_A_23_P329740	UBC	Ubiquitin C	NM_021009	7316	0.00884742
AGL_HUM1_OLIGO_A_32_P65473			ENST00000330640		0.00884742
AGL_HUM1_OLIGO_A_23_P57227	SN1A1	Syntrophin, alpha 1 (dystrophin-associated protein A1, 59kDa, acidic component)	NM_003098	6640	0.00884742
AGL_HUM1_OLIGO_A_23_P360964	MGC15476	Thymus expressed gene 3-like	NM_145056	147906	0.00961462
AGL_HUM1_OLIGO_A_23_P162466	PKP2	Plakophilin 2	NM_004572	5318	0.01072345
AGL_HUM1_OLIGO_A_24_P344961	AMOT	Angiomotin	NM_133265	154796	0.01072345
AGL_HUM1_OLIGO_A_24_P93462			A_24_P93462		0.01072345
AGL_HUM1_OLIGO_A_24_P943613	TBC1D1	TBC1 (tre-2/USP6, BUB2, cdc16) domain family, member 1	NM_015173	23216	0.01072345
AGL_HUM1_OLIGO_A_23_P77310	SH3BP3	SH3-domain binding protein 3	NM_022473	64397	0.01072345
AGL_HUM1_OLIGO_A_23_P55926	NR1H2	Nuclear receptor subfamily 1, group H, member 2	NM_007121	7376	0.01072345
AGL_HUM1_OLIGO_A_23_P368484	FLJ35696	FLJ35696 protein	NM_207387	388341	0.01072345
AGL_HUM1_OLIGO_A_24_P399680	C20orf108	Chromosome 20 open reading frame 108	NM_080821	116151	0.01128431
AGL_HUM1_OLIGO_A_23_P169738	SOX7	SRY (sex determining region Y)-box 7	NM_031439	83595	0.01216998
AGL_HUM1_OLIGO_A_24_P137434	DCBLD2	Discoidin, CUB and LCCL domain containing 2	NM_080927	131566	0.01216998
AGL_HUM1_OLIGO_A_23_P19134	MASS1	Monogenic, audiogenic seizure susceptibility 1 homolog (mouse)	NM_032119	84059	0.01231733
AGL_HUM1_OLIGO_A_24_P200942	THG-1	TSC-22-like	NM_030935	81628	0.01331317
AGL_HUM1_OLIGO_A_24_P337000	TTC7A	Tetratricopeptide repeat domain 7A	NM_020458	57217	0.01331317
AGL_HUM1_OLIGO_A_23_P333683	IGSF10	Immunoglobulin superfamily, member 10	NM_178822	285313	0.01454206
AGL_HUM1_OLIGO_A_24_P115621			ENST00000373218		0.01801736
AGL_HUM1_OLIGO_A_23_P158885			AK096342	114977	0.01836372
AGL_HUM1_OLIGO_A_23_P158885	LOC114977	Hypothetical protein BC014148	AK128814		0.01836372
AGL_HUM1_OLIGO_A_24_P931944		CDNA FLJ25106 fis, clone CBR01467	NM_004323	573	0.01945735
AGL_HUM1_OLIGO_A_23_P146654	BAG1	BCL2-associated athanogene	NM_145177	207063	0.02031249
AGL_HUM1_OLIGO_A_24_P378987	DHRX	Zinc finger, BED domain containing 1	NM_002556		0.02031249
AGL_HUM1_OLIGO_A_32_P135336			AA449494	8788	0.02031249
AGL_HUM1_OLIGO_A_32_P196837	DLK1	Delta-like 1 homolog (Drosophila)	NM_018218	55230	0.02031249
AGL_HUM1_OLIGO_A_24_P314668	USP40	Ubiquitin specific protease 40	ENST00000287144		0.02066335
AGL_HUM1_OLIGO_A_24_P289188			NM_001007071	6199	0.0210813
AGL_HUM1_OLIGO_A_23_P24318		Ribosomal protein S6 kinase, 70kDa, polypeptide 2	NM_030649	116983	0.0210813
AGL_HUM1_OLIGO_A_23_P23630	CENTB5	Centaurin, beta 5	BC066984	5604	0.0210813
AGL_HUM1_OLIGO_A_24_P287613	MAP2K1	Mitogen-activated protein kinase kinase 1	NM_032409	65018	0.0210813
AGL_HUM1_OLIGO_A_23_P23194	PINK1	PTEN induced putative kinase 1	NM_014867		0.0210813
AGL_HUM1_OLIGO_A_23_P94319			NM_181657	1241	0.0210813
AGL_HUM1_OLIGO_A_23_P151791	LTBR	Leukotriene B4 receptor	NM_007171	10585	0.02121958
AGL_HUM1_OLIGO_A_23_P146354	POMT1	Protein-O-mannosyltransferase 1	NM_022737	64748	0.02121958
AGL_HUM1_OLIGO_A_24_P820302	LPFR2	Lipid phosphate phosphatase-related protein type 2	THC2411433		0.02121958
AGL_HUM1_OLIGO_A_24_P873764			NM_152424	139285	0.02121958
AGL_HUM1_OLIGO_A_24_P280903	BCR	Hypothetical protein FLJ39827	NM_004327	613	0.02121958
AGL_HUM1_OLIGO_A_23_P395524	FLJ39827	Breakpoint cluster region	ENST00000311218		0.02121958
AGL_HUM1_OLIGO_A_23_P395524			NM_007062	11137	0.02121958
AGL_HUM1_OLIGO_A_23_P175935	PWP1	Nuclear phosphoprotein similar to S. cerevisiae PWP1	AK125162		0.02121958
AGL_HUM1_OLIGO_A_32_P62387	NUDT11	CDNA FLJ43172 fis, clone FCBBF3007242	NM_018159	55190	0.02121958
AGL_HUM1_OLIGO_A_23_P393080	CALML3	Nudix (nucleoside diphosphate linked moiety X)-type motif 11	NM_005185	810	0.02121958

Table 2 - FDR for Comparison of Baseline Arm and Back Samples Between Responders and Non-Responders

Agilent Probe ID	Gene Symbol	Gene Name	Accession	Entrez Gene ID	FDR
AGL_HUM1_OLIGO_A_24_P418019			A_24_P418019		0.02121958
AGL_HUM1_OLIGO_A_23_P134693			NM_001009552		0.02121958
AGL_HUM1_OLIGO_A_23_P207650	ACADVL	Acyl-Coenzyme A dehydrogenase, very long chain	NM_000018	37	0.02121958
AGL_HUM1_OLIGO_A_32_P116058			NR_002800		0.02121958
AGL_HUM1_OLIGO_A_24_P737553		CDNA FLJ13712 fs, clone PLACE2000394	AK023774		0.02121958
AGL_HUM1_OLIGO_A_32_P224586			THC2342537		0.02121958
AGL_HUM1_OLIGO_A_23_P104295	SHFM3	Split hand/foot malformation (ectrodactyly) type 3	NM_022039	6468	0.02121958
AGL_HUM1_OLIGO_A_32_P108592			THC2312637		0.02121958
AGL_HUM1_OLIGO_A_32_P100439	Elis1	Hypothetical protein Elis1	NM_152793	222166	0.02121958
AGL_HUM1_OLIGO_A_23_P218807	Roxan	Rotavirus X protein associated with NSP3	NM_017590	23264	0.02121958
AGL_HUM1_OLIGO_A_23_P50799	OR10H2	Olfactory receptor, family 10, subfamily H, member 2	NM_013939	26538	0.02121958
AGL_HUM1_OLIGO_A_24_P98411	HSPA5	Heat shock 70kDa protein 5 (glucose-regulated protein, 78kDa)	NM_005347	3309	0.02121958
AGL_HUM1_OLIGO_A_24_P380348	SMAP1	Stromal membrane-associated protein 1	NM_021940	60682	0.02121958
AGL_HUM1_OLIGO_A_23_P356021	FANCB	Fanconi anemia, complementation group B	NM_152633	2187	0.02121958
AGL_HUM1_OLIGO_A_32_P220798	CD34	CD34 antigen	NM_001773	947	0.02121958
AGL_HUM1_OLIGO_A_24_P814444			THC2407545		0.02172937
AGL_HUM1_OLIGO_A_23_P159650	COX7B	Cytochrome c oxidase subunit VIIb	NM_001866	1349	0.02172937
AGL_HUM1_OLIGO_A_23_P97265	GPATC4	G patch domain containing 4	NM_182679	54865	0.02172937
AGL_HUM1_OLIGO_A_24_P612020	SCSTM1	Sequestosome 1	AK096241	8878	0.02172937
AGL_HUM1_OLIGO_A_24_P73577	ALDH1A2	Aldehyde dehydrogenase 1 family, member A2	NM_170697	8854	0.02172937
AGL_HUM1_OLIGO_A_24_P257201	MRPL30	Mitochondrial ribosomal protein L30	NM_145213	51263	0.02172937
AGL_HUM1_OLIGO_A_23_P374284	CASC3	Cancer susceptibility candidate 3	NM_007359	22794	0.02172937
AGL_HUM1_OLIGO_A_32_P142407			A_32_P142407		0.02172937
AGL_HUM1_OLIGO_A_24_P924957	KRT18	Keratin 18	L32537	3875	0.02244126
AGL_HUM1_OLIGO_A_23_P152199	CTRL	Chymotrypsin-like	NM_001907	1506	0.02244126
AGL_HUM1_OLIGO_A_24_P67699	RPL23A	Ribosomal protein L23a	NM_000984	6147	0.02274152
AGL_HUM1_OLIGO_A_23_P48585	SALL2	Sal-like 2 (Drosophila)	NM_005407	6297	0.02274152
AGL_HUM1_OLIGO_A_24_P42330		LOC440523	AK090827	440523	0.02274152
		Eukaryotic translation elongation factor 1 delta (guanine nucleotide exchange protein)			
AGL_HUM1_OLIGO_A_23_P31833	EEF1D		NM_032378	1936	0.02301926
AGL_HUM1_OLIGO_A_24_P389415			NM_007257		0.02309658
AGL_HUM1_OLIGO_A_23_P119794		Full-length CDNA clone CSDDM002YA18 of Fetal liver of Homo sapiens (human)	CR608907		0.02333418
AGL_HUM1_OLIGO_A_23_P102420	CC14	Chaperonin containing TCP1, subunit 4 (delta)	NM_006430	10575	0.02343542
AGL_HUM1_OLIGO_A_24_P29966	TRIM32	Tripartite motif-containing 32	NM_012210	22954	0.02352042
AGL_HUM1_OLIGO_A_23_P66924	FLJ20071	Dymedlin	NM_017653	54808	0.02352042
AGL_HUM1_OLIGO_A_23_P139950	KPNAB	Karyopherin alpha 3 (importin alpha 4)	NM_002267	3839	0.02352042
AGL_HUM1_OLIGO_A_23_P156708	TNKB	Tenascin XB	NM_019105	7148	0.02423024
AGL_HUM1_OLIGO_A_24_P306558	KIAA1049	KIAA1049 protein	NM_014972	22980	0.02423024
AGL_HUM1_OLIGO_A_23_P89824	MGC11386	Hypothetical protein MGC11386	NM_032933	85019	0.02423447
AGL_HUM1_OLIGO_A_32_P23525		CDNA FLJ42287 fs, clone TLIVE2005866	AK124281		0.02423447
AGL_HUM1_OLIGO_A_24_P336577	LOC55924	Hypothetical protein LOC55924	NM_019099	55924	0.02423447
AGL_HUM1_OLIGO_A_23_P168847	FBXO16	F-box protein 16	NM_172366	157574	0.02423447
AGL_HUM1_OLIGO_A_24_P510377		Hypothetical gene supported by BCO31250	BCO31250	400751	0.02439724
AGL_HUM1_OLIGO_A_23_P202156	NFKB2	Nuclear factor of kappa light polypeptide gene enhancer in B-cells 2 (p49/p100)	NM_002502	4791	0.02439724
AGL_HUM1_OLIGO_A_23_P57961	PLXNB1	Plexin B1	NM_002673	5364	0.02445234
AGL_HUM1_OLIGO_A_23_P208310	ACE-1	CD3-epsilon-associated protein; antisense to ERCC-1	NM_012099	10849	0.02445234
AGL_HUM1_OLIGO_A_23_P94660	TBC1D13	TBC1 domain family, member 13	NM_018201	54662	0.02445234

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Agilent Probe ID	Gene Symbol	Gene Name	Accession	Entrez Gene ID	FDR
AGI_HUM1_OLIGO_A_24_P930796	C10orf72	Chromosome 10 open reading frame 72	AK001062	196740	0.02445234
AGI_HUM1_OLIGO_A_32_P112881			ENST00000374274		0.02452672
AGI_HUM1_OLIGO_A_24_P22892	KCTD15	Potassium channel tetramerisation domain containing 15	NM_024076	79047	0.02495697
AGI_HUM1_OLIGO_A_32_P117760			BG208131		0.02495697
AGI_HUM1_OLIGO_A_23_P59022	TRERF1	Transcriptional regulating factor 1	NM_033502	55809	0.02495697
AGI_HUM1_OLIGO_A_23_P168449	RASAA	RAS p21 protein activator 4	NM_006989	10156	0.02495697
AGI_HUM1_OLIGO_A_23_P160159	SLC2A5	Solute carrier family 2 (facilitated glucose/fructose transporter), member 5	NM_003039	6518	0.02495697
AGI_HUM1_OLIGO_A_23_P127793	FLJ35827	Hypothetical protein FLJ35827	NM_153265	256364	0.02495697
AGI_HUM1_OLIGO_A_23_P205228	ATP7B	ATPase, Cu++ transporting, beta polypeptide (Wilson disease)	NM_000053	540	0.02495697
AGI_HUM1_OLIGO_A_24_P247820			AK074633		0.02505001
AGI_HUM1_OLIGO_A_23_P351734	NPHP4	Nephronophthisis 4	NM_015102	261734	0.0259092
AGI_HUM1_OLIGO_A_32_P109755		Unknown mRNA	AF62446		0.02600757
AGI_HUM1_OLIGO_A_32_P142700	C22orf15	Chromosome 22 open reading frame 15	NM_182520	150248	0.02600757
AGI_HUM1_OLIGO_A_23_P362183	SAMD6	Sterile alpha motif domain containing 6	NM_173551	203286	0.02600757
AGI_HUM1_OLIGO_A_24_P475556	LOC146346	Hypothetical protein LOC146346	AK057359	146346	0.02600757
AGI_HUM1_OLIGO_A_23_P258972	GOLGA1	Golgi autoantigen, golgin subfamily a, 1	NM_002077	2800	0.02600757
AGI_HUM1_OLIGO_A_23_P2990	CEBPE	CCAAT/enhancer binding protein (C/EBP), epsilon	NM_001805	1053	0.02600757
AGI_HUM1_OLIGO_A_24_P177964	KIAA1602	KIAA1602 protein	BC033253	57701	0.02600757
		Eukaryotic translation elongation factor 1 delta (guanine nucleotide exchange protein)	NM_032378	1936	0.02600757
AGI_HUM1_OLIGO_A_23_P160523	TRIM45	Tripartite motif-containing 45	NM_025188	80263	0.02600757
AGI_HUM1_OLIGO_A_23_P135826	LOC114977	Hypothetical protein BC014148	AK096342	114977	0.02600757
AGI_HUM1_OLIGO_A_24_P478940			A_24_P478940		0.02600757
AGI_HUM1_OLIGO_A_32_P206989			AK023412		0.02600757
AGI_HUM1_OLIGO_A_32_P524014			ENST00000367545		0.02600757
AGI_HUM1_OLIGO_A_23_P117125	RARG	Retinoic acid receptor, gamma	NM_000966	5916	0.02600757
AGI_HUM1_OLIGO_A_23_P422144	FAM43A	Family with sequence similarity 43, member A	NM_153690	131583	0.02600757
AGI_HUM1_OLIGO_A_24_P417935	CENTG1	Centaurin, gamma 1	CR590071	116986	0.02600757
AGI_HUM1_OLIGO_A_32_P75888	COMMD10	COMM domain containing 10	CD243286	51397	0.02600757
AGI_HUM1_OLIGO_A_24_P902653	MGC2747	Hypothetical protein MGC2747	CR616041	79086	0.02600757
AGI_HUM1_OLIGO_A_23_P156284	DBN1	Drebrin 1	NM_080881	1627	0.02600757
AGI_HUM1_OLIGO_A_32_P224327		CDNA FLJ13839 fis, clone NT2RP7000086	AK056401		0.02600757
AGI_HUM1_OLIGO_A_32_P144220			ENST00000374534		0.02600757
AGI_HUM1_OLIGO_A_32_P192474	C6orf31	Chromosome 6 open reading frame 31	NM_030651	80863	0.02600757
AGI_HUM1_OLIGO_A_24_P399630	PRKACA	Protein kinase, cAMP-dependent, catalytic, alpha	NM_002730	5566	0.02600757
AGI_HUM1_OLIGO_A_24_P203072	PHF16	PHD finger protein 16	NM_014735	9767	0.02600757
AGI_HUM1_OLIGO_A_23_P50368	OSCAR	Osteoclast-associated receptor	NM_206818	126014	0.02600757
AGI_HUM1_OLIGO_A_23_P421401	PCGFRB	Platelet-derived growth factor receptor, beta polypeptide	NM_002609	5159	0.02600757
AGI_HUM1_OLIGO_A_23_P373598	MARK	V-maf musculoaponeurotic fibrosarcoma oncogene homolog K (avian)	NM_002360	7975	0.02600757
AGI_HUM1_OLIGO_A_23_P103084	TMN1	Target of myb1 (chicken)	NM_005488	10043	0.02600757
AGI_HUM1_OLIGO_A_23_P149427	CAPN9	Calpain 9	NM_006615	10753	0.02600779
AGI_HUM1_OLIGO_A_23_P254863	MGC42105	Hypothetical protein MGC42105	NM_153361	167359	0.02610687
AGI_HUM1_OLIGO_A_24_P344416	DSC3	Desmocollin 3	NM_024423	1825	0.02615967
AGI_HUM1_OLIGO_A_23_P216282	ARHGGEF10	Rho guanine nucleotide exchange factor (GEF) 10	NM_014629	9639	0.02626067
AGI_HUM1_OLIGO_A_23_P14273	ZFYVE1	Zinc finger, FYVE domain containing 21	NM_024071	79038	0.02691455
AGI_HUM1_OLIGO_A_24_P713729			THC2373625		0.02706542
AGI_HUM1_OLIGO_A_23_P397055			NM_019015	54480	0.02708649
AGI_HUM1_OLIGO_A_24_P11045			THC2271174		0.02708649
AGI_HUM1_OLIGO_A_32_P171232	CSGICA-T	Chondroitin sulfate glucuronyltransferase	A_32_P171232		0.02708649

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Agilent Probe ID	Gene Symbol	Gene Name	Accession	Entrez Gene ID	FDR
AGI_HUM1_OLIGO_A_23_P142125	HRC	Histidine rich calcium binding protein	NM_002152	3270	0.02708649
AGI_HUM1_OLIGO_A_23_P254165	RAI2	Rethinoic acid induced 2	NM_021785	10742	0.02871497
AGI_HUM1_OLIGO_A_23_P208991	PALM	Paralemmin	NM_002579	5064	0.02871497
AGI_HUM1_OLIGO_A_24_P343289	CDC2L6	Cell division cycle 2-like 6 (CDK8-like)	NM_015076	23097	0.02871497
AGI_HUM1_OLIGO_A_23_P114105	LDCC1	Leucine zipper, down-regulated in cancer 1	NM_012317	23641	0.02934208
AGI_HUM1_OLIGO_A_32_P460399		MRNA full length insert cDNA clone EUROIIMAGE 2362292	AL365520	0.02949116	
AGI_HUM1_OLIGO_A_23_P4604	ZNF600	Zinc finger protein 600	NM_198457	162966	0.02977394
AGI_HUM1_OLIGO_A_23_P253723	RRH	Retinal pigment epithelium-derived rhodopsin homolog	NM_006583	10692	0.02977394
AGI_HUM1_OLIGO_A_24_P84279	EBPL	Emopamil binding protein-like	NM_032565	84650	0.03082569
AGI_HUM1_OLIGO_A_23_P502371	PHF2	PHD finger protein 2	NM_024517	5253	0.03120828
AGI_HUM1_OLIGO_A_32_P84342			THC2315140	51161	0.03192985
AGI_HUM1_OLIGO_A_23_P155477	LOC51161	G20 protein	NM_016210	51161	0.03192985
AGI_HUM1_OLIGO_A_24_P923704	TOLLIP	Toll interacting protein	AF321778	54472	0.03192985
AGI_HUM1_OLIGO_A_23_P80048			NR_001442		0.03192985
AGI_HUM1_OLIGO_A_23_P154338	EFHD1	EF hand domain containing 1	NM_025202	80303	0.03192985
AGI_HUM1_OLIGO_A_23_P408996	OACT1	O-acetyltransferase (membrane bound) domain containing 1	AK131269	154141	0.03192985
AGI_HUM1_OLIGO_A_23_P211141	DSCAM	Down syndrome cell adhesion molecule	NM_001389	1826	0.03192985
AGI_HUM1_OLIGO_A_32_P16315			ENST00000272035		0.03192985
AGI_HUM1_OLIGO_A_24_P289818			ENST00000370659		0.03192985
AGI_HUM1_OLIGO_A_23_P375165	FLJ35767	FLJ35767 protein	NM_207459	400629	0.03192985
AGI_HUM1_OLIGO_A_32_P45780			THC2282384		0.03192985
AGI_HUM1_OLIGO_A_24_P921823	CAMK2D	Calcium/calmodulin-dependent protein kinase (Cam kinase) II delta	ENST00000369397		0.03192985
AGI_HUM1_OLIGO_A_23_P144458	TFF1	Trefoil factor 1 (breast cancer, estrogen-inducible sequence expressed in)	NM_001221	817	0.03192985
AGI_HUM1_OLIGO_A_23_P68759	HIST1H2AM	Histone 1, H2am	NM_003225	7031	0.03192985
AGI_HUM1_OLIGO_A_32_P221799			NM_003514	8336	0.03192985
AGI_HUM1_OLIGO_A_32_P110433	MLPH	Melanophilin	THC2273687		0.03192985
AGI_HUM1_OLIGO_A_23_P165778	DSCR11	Down syndrome critical region gene 1-like 1	NM_024101	79083	0.03192985
AGI_HUM1_OLIGO_A_32_P156851	WBSCR21	Williams Beuren syndrome chromosome region 21	NM_005822	10231	0.03192985
AGI_HUM1_OLIGO_A_23_P315933	BLNK	B-cell linker	NM_031295	83451	0.03192985
AGI_HUM1_OLIGO_A_24_P64344	OCRL	Oculocerebrorenal syndrome of Lowe	NM_013314	29760	0.03192985
AGI_HUM1_OLIGO_A_23_P32903		Protein tyrosine phosphatase, receptor type, f polypeptide (PTPRF), interacting protein (liprin), alpha 3	NM_000276	4952	0.03192985
AGI_HUM1_OLIGO_A_23_P320553	PPF1A3		NM_003660	8541	0.0321749
AGI_HUM1_OLIGO_A_32_P55106			THC2374814		0.0321749
AGI_HUM1_OLIGO_A_24_P263543			ENST00000277860		0.03231425
AGI_HUM1_OLIGO_A_23_P65674	TMOD3	Tropomodulin 3 (ubiquitous)	NM_014547	29766	0.03231425
AGI_HUM1_OLIGO_A_23_P257609	RPL29	Ribosomal protein L29	NM_000992	6159	0.03231425
AGI_HUM1_OLIGO_A_24_P276864	FLJ20297	Hypothetical protein FLJ20297	NM_017951	55627	0.0327972
AGI_HUM1_OLIGO_A_24_P118341	KENAE	Kenae	BF869497	202243	0.03286109
AGI_HUM1_OLIGO_A_23_P431268	PLEKHA6	Pleckstrin homology domain containing, family A member 6	NM_014935	22874	0.03286109
AGI_HUM1_OLIGO_A_24_P367804			BC024651		0.03286109
AGI_HUM1_OLIGO_A_23_P24433	CTSF	Cathepsin F	NM_003793	8722	0.03286109
AGI_HUM1_OLIGO_A_32_P96692			THC2340838		0.03286109
AGI_HUM1_OLIGO_A_23_P48570	DHRS2	Dehydrogenase/reductase (SDR family) member 2	NM_182908	10202	0.03286109
AGI_HUM1_OLIGO_A_24_P302898	BAP1	BRCA1 associated protein-1 (ubiquitin carboxy-terminal hydrolase)	NM_004656	8314	0.03286109
AGI_HUM1_OLIGO_A_23_P96369	FLJ10178	Hypothetical protein FLJ10178	NM_018015	55086	0.03286109
AGI_HUM1_OLIGO_A_24_P322444	NUP62	Nucleoporin 62KDa	NM_153719	23636	0.03286109
AGI_HUM1_OLIGO_A_24_P936692		Homo sapiens, clone IMAGE:4822684, mRNA	BC033528		0.03286109
AGI_HUM1_OLIGO_A_23_P164011	SOX15	SRY (sex determining region Y)-box 15	NM_006942	6665	0.03286109

Table 2 - FDR for Comparison of Baseline Arm and Back Samples Between Responders and Non-Responders

Agilent Probe ID	Gene Symbol	Gene Name	Accession	Entrez Gene ID	FDR
AGL_HUM1_OLIGO_A_24_P289383	CHD7	Chromodomain helicase DNA binding protein 7	NM_017780	55636	0.03300997
AGL_HUM1_OLIGO_A_24_P160874	DUT	DUTP pyrophosphatase	NM_001948	1854	0.03307712
AGL_HUM1_OLIGO_A_24_P788227		LOC440156	BC041856	440156	0.03307712
AGL_HUM1_OLIGO_A_23_P338919			AK055387		0.03307712
AGL_HUM1_OLIGO_A_24_P302374	CLCN6	Chloride channel 6	NM_001286	1185	0.03307712
AGL_HUM1_OLIGO_A_32_P22362	DGKI	Developmentally regulated GTP binding protein 1	AK127132	4733	0.03326542
AGL_HUM1_OLIGO_A_23_P85585	LCN7	Lipocalin 7	NM_022164	64129	0.03326542
AGL_HUM1_OLIGO_A_24_P185966	MGC23937	Hypothetical protein MGC23937 similar to CG4798	NM_145052	139596	0.03340835
AGL_HUM1_OLIGO_A_32_P27327	ITIM1	Integral membrane protein 1	W27166	3703	0.03340835
AGL_HUM1_OLIGO_A_23_P253052	CD99L2	CD99 antigen-like 2	NM_031462	83692	0.03377243
AGL_HUM1_OLIGO_A_24_P409471			ENST00000316861		0.03449789
AGL_HUM1_OLIGO_A_24_P275873	TBCD	Tubulin-specific chaperone d	NM_005993	6904	0.03459929
AGL_HUM1_OLIGO_A_23_P356004	CSEN	Calseculin, presenilin binding protein, EF hand transcription factor	NM_013434	30818	0.03471589
AGL_HUM1_OLIGO_A_24_P226248	ZMAT2	Zinc finger, matrix type 2	NM_144723	153527	0.03471589
AGL_HUM1_OLIGO_A_24_P374652	NUCKS	Nuclear ubiquitously casein kinase and cyclin-dependent kinase substrate	NM_022731	64710	0.03471589
AGL_HUM1_OLIGO_A_23_P104224	ACF	Apobec-1 complementation factor	NM_138933	29974	0.03471589
AGL_HUM1_OLIGO_A_24_P270769	VPS35	Vacuolar protein sorting 35 (yeast)	NM_018206	55737	0.03471589
AGL_HUM1_OLIGO_A_23_P89113	FLJ14154	Hypothetical protein FLJ14154	NM_024845	79903	0.03471589
AGL_HUM1_OLIGO_A_24_P942112	POLR1B	Hypothetical protein (RNA) 1 polypeptide B, 128kDa	NM_019014	84172	0.0348849
AGL_HUM1_OLIGO_A_23_P111452	CENTG3	Centaurin, gamma 3	NM_031946	116988	0.03501603
AGL_HUM1_OLIGO_A_23_P72127	KIAA1446	Brain-enriched guanylate kinase-associated protein	NM_020836	57596	0.03519474
AGL_HUM1_OLIGO_A_32_P176018	LOC81569	Actin like protein	NM_030812	81569	0.03532587
AGL_HUM1_OLIGO_A_32_P319200	GGT14	Gamma-glutamyltransferase-like 4	NM_199127	91227	0.03544083
AGL_HUM1_OLIGO_A_24_P97849	DBM1	Drebrin 1	NM_080881	1627	0.03544083
AGL_HUM1_OLIGO_A_24_P75708			A_24_P75708		0.03544083
AGL_HUM1_OLIGO_A_32_P82293			A_32_P82293		0.03544083
AGL_HUM1_OLIGO_A_24_P358279	ALP	Alkaline phosphatase, placental (Regan isozyme)	A_24_P358279		0.03544083
AGL_HUM1_OLIGO_A_23_P79587	MGC2731	Hypothetical protein MGC2731	NM_001632	250	0.03544083
AGL_HUM1_OLIGO_A_24_P283928			NM_024068	79035	0.03544083
AGL_HUM1_OLIGO_A_24_P101271			A_24_P101271		0.03546775
AGL_HUM1_OLIGO_A_32_P226186	ARID3B	AT rich interactive domain 3B (BRG1-like)	THC2266474		0.03546775
AGL_HUM1_OLIGO_A_23_P88580	C22orf1	Chromosome 22 open reading frame 1	NM_006465	10620	0.03562191
AGL_HUM1_OLIGO_A_23_P146855	C10orf84	Chromosome 10 open reading frame 84	NM_001585	758	0.03562191
AGL_HUM1_OLIGO_A_23_P115743	DOT1L	DOT1-like, histone H3 methyltransferase (S. cerevisiae)	NM_022063	63877	0.03579344
AGL_HUM1_OLIGO_A_23_P408768	FLJ22955	Hypothetical protein FLJ22955	NM_032482	84444	0.03579344
AGL_HUM1_OLIGO_A_24_P58331			NM_024819	79877	0.03579344
AGL_HUM1_OLIGO_A_32_P101623	BCAS3	Breast carcinoma amplified sequence 3	THC2337763		0.03579344
AGL_HUM1_OLIGO_A_23_P141660		CTD (carboxy-terminal domain, RNA polymerase II, polypeptide A) small phosphatase 2	NM_017679	54828	0.03579344
AGL_HUM1_OLIGO_A_23_P81880	CTDSP2		NM_005730	10106	0.03579344
AGL_HUM1_OLIGO_A_32_P26017	RPL23	Ribosomal protein L23	DB380193		0.03579344
AGL_HUM1_OLIGO_A_23_P26713	PDAP1	PDGFA associated protein 1	NM_000978	9349	0.03579344
AGL_HUM1_OLIGO_A_23_P123256			NM_014891	11333	0.03579344
AGL_HUM1_OLIGO_A_24_P125311	ITIH5	Inter-alpha (globulin) inhibitor H5	A_24_P125311		0.03579344
AGL_HUM1_OLIGO_A_23_P104252	KIAA0240	KIAA0240	NM_030569	80760	0.03579344
AGL_HUM1_OLIGO_A_32_P134657	AP2S1	Adaptor-related protein complex 2, sigma 1 subunit	NM_015349	23506	0.03579344
AGL_HUM1_OLIGO_A_24_P113295	SEC14L2	SEC14-like 2 (S. cerevisiae)	NM_004069	1175	0.03579344
AGL_HUM1_OLIGO_A_23_P17811	PRDM11	PR domain containing 11	NM_012429	23541	0.03579344
AGL_HUM1_OLIGO_A_23_P13057			NM_020229	56981	0.03579344

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Agilent Probe ID	Gene Symbol	Gene Name	Accession	Entrez Gene ID	FDR
AGL_HUM1_OLIGO_A_23_P70827	KIAA1549	KIAA1549 protein	AL136736	57670	0.03579344
AGL_HUM1_OLIGO_A_23_P84118	CDH18	Cadherin 18, type 2	NM_004934	1016	0.03581628
AGL_HUM1_OLIGO_A_32_P32653	SENP5	SUMO1/sentrin specific protease 5	BC036626	205564	0.03588595
AGL_HUM1_OLIGO_A_32_P183765	ENBB4	V-erb-a erythroblastic leukemia viral oncogene homolog 4 (avian)	AK126298	2066	0.03588595
AGL_HUM1_OLIGO_A_23_P35820	CELI1	Cofilin 1 (non-muscle)	NM_005507	1072	0.03588595
AGL_HUM1_OLIGO_A_24_P941268	CA5B	Inactivation escape 2	NM_007220	11238	0.03588595
AGL_HUM1_OLIGO_A_23_P57199	GGTLA4	Gamma-glutamyltransferase-like activity 4	NM_080920	92086	0.03588595
AGL_HUM1_OLIGO_A_23_P101532	RPS11	Ribosomal protein S11	NM_001015	6205	0.03590805
AGL_HUM1_OLIGO_A_23_P143981	FBLN2	Fibulin 2	NM_001004019	2199	0.03619918
AGL_HUM1_OLIGO_A_24_P68008			ENST00000294485		0.03668376
AGL_HUM1_OLIGO_A_32_P177477			THC2344152		0.03673976
AGL_HUM1_OLIGO_A_23_P117380	C14orf152	Chromosome 14 open reading frame 152	NM_138344	90050	0.0369129
AGL_HUM1_OLIGO_A_23_P421011	KAZALD1	Kazal-type serine protease inhibitor domain 1	NM_030929	81621	0.0370985
AGL_HUM1_OLIGO_A_23_P80759	PVR/L3	Polliovirus receptor-related 3	BC017572	25945	0.0370985
AGL_HUM1_OLIGO_A_23_P18292	RPL14	Ribosomal protein L14	NM_003973	9045	0.03825962
AGL_HUM1_OLIGO_A_24_P108779	FLJ12242	Hypothetical protein FLJ12242	NM_024681	79734	0.03825962
AGL_HUM1_OLIGO_A_24_P753592	HGD	Homogentisate 1,2-dioxygenase (homogentisate oxidase)	BC018589		0.03825962
AGL_HUM1_OLIGO_A_23_P250164	OLIG1	Oligodendrocyte transcription factor 1	NM_000187	3081	0.03825962
AGL_HUM1_OLIGO_A_23_P154849	CBX1	Chromobox homolog 1 (HP1 beta homolog Drosophila)	NM_138983	116448	0.03825962
AGL_HUM1_OLIGO_A_24_P296568			NM_006807	10951	0.03825962
AGL_HUM1_OLIGO_A_23_P315106	KIAA1862	KIAA1862 protein	ENST00000380410		0.03892307
AGL_HUM1_OLIGO_A_32_P38637	DKFZP434P1750	DKFZP434P1750 protein	NM_032534	84626	0.03892307
AGL_HUM1_OLIGO_A_23_P22382			NM_015527	26000	0.03956369
AGL_HUM1_OLIGO_A_32_P194563			THC2281660		0.03973329
AGL_HUM1_OLIGO_A_23_P78517	SFRS16	Splicing factor, arginine/serine-rich 16 (suppressor-of-white-apricot homolog, Drosophila)	NM_007056	11129	0.03973329
AGL_HUM1_OLIGO_A_23_P168868	PTDSS1	Phosphatidylserine synthase 1	NM_014754	9791	0.03973329
AGL_HUM1_OLIGO_A_24_P7330			A_24_P7330		0.03973329
AGL_HUM1_OLIGO_A_23_P316850	C19orf19	Chromosome 19 open reading frame 19	NM_182577	284451	0.03973329
AGL_HUM1_OLIGO_A_23_P428992			ENST00000382579		0.03973329
AGL_HUM1_OLIGO_A_23_P69141	DNCL1	Dynein, cytoplasmic, light intermediate polypeptide 1	NM_016141	51143	0.03973329
AGL_HUM1_OLIGO_A_23_P112429	RPL35	Ribosomal protein L35	NM_007209	11224	0.03973329
AGL_HUM1_OLIGO_A_23_P18082	FLJ14566	Hypothetical protein FLJ14566	NM_032806	84892	0.03977095
AGL_HUM1_OLIGO_A_23_P27424	ZNF418	Zinc finger protein 418	NM_133460	147686	0.03977095
AGL_HUM1_OLIGO_A_23_P392082			ENST00000361800		0.03977095
AGL_HUM1_OLIGO_A_32_P104023			THC2346121		0.03977095
AGL_HUM1_OLIGO_A_23_P159974	KHLH13	Kelch-like 13 (Drosophila)	NM_033495	90293	0.03978727
AGL_HUM1_OLIGO_A_24_P659113	FLJ40432	Hypothetical protein FLJ40432	NM_152523	151195	0.03998933
AGL_HUM1_OLIGO_A_23_P203819	GOLGA3	Golgi autoantigen, golgin subfamily a, 3	NM_005895	2802	0.04003625
AGL_HUM1_OLIGO_A_32_P234996			THC2311218		0.04003625
AGL_HUM1_OLIGO_A_23_P149375	CTMP	C-terminal modulator protein	NM_053055	117145	0.04003625
AGL_HUM1_OLIGO_A_23_P404059	PASD1	PAS domain containing 1	NM_173493	139135	0.04003625
AGL_HUM1_OLIGO_A_23_P201368	CTBS	Chitinase, di-N-acetyl-	NM_004388	1486	0.04008632
AGL_HUM1_OLIGO_A_23_P117298	F7	Coagulation factor VII (serum prothrombin conversion accelerator)	NM_000131	2155	0.04008632
AGL_HUM1_OLIGO_A_32_P49350			CR609307		0.040121
AGL_HUM1_OLIGO_A_32_P26443			THC2258710		0.040121
AGL_HUM1_OLIGO_A_24_P384119			XM_942451		0.04032726
AGL_HUM1_OLIGO_A_23_P147388			NM_015254	23303	0.04032726
AGL_HUM1_OLIGO_A_23_P393697	KIF13B	Kinesin family member 13B	BC024231	157247	0.0405513
	MGC27345	Hypothetical protein MGC27345			

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AGL_HUM1_OLIGO_A_24_P290263	STX1A	Syntaxin 1A (brain)	A_24_P290263	855	0.04072885
AGL_HUM1_OLIGO_A_23_P168556	WDFP2	WD repeat and FYVE domain containing 2	NM_004603	6804	0.04072885
AGL_HUM1_OLIGO_A_23_P218108	FLJ14624	Hypothetical protein FLJ14624	NM_052950	115825	0.04114115
AGL_HUM1_OLIGO_A_24_P278853	KLHL12	Kelch-like 12 (Drosophila)	NM_032813	84899	0.04114115
AGL_HUM1_OLIGO_A_23_P161041			NM_021633	59349	0.04114115
AGL_HUM1_OLIGO_A_32_P214758			THC2383313		0.04114115
AGL_HUM1_OLIGO_A_23_P6398	AP1B1	Adaptor-related protein complex 1, beta 1 subunit	NM_001127	162	0.04114115
AGL_HUM1_OLIGO_A_24_P40928			ENST00000281228		0.04285574
AGL_HUM1_OLIGO_A_24_P3804	RPL35	Ribosomal protein L35	NM_007209	11224	0.04285574
AGL_HUM1_OLIGO_A_23_P16866	VIL1	Villin 1	NM_007127	7429	0.0429901
AGL_HUM1_OLIGO_A_23_P16866	RNH	Ribonuclease/angiogenin inhibitor	NM_002939	6050	0.04300262
AGL_HUM1_OLIGO_A_23_P202672	SCY1	SCY1-like 1 (S. cerevisiae)	NM_020680	57410	0.04341005
AGL_HUM1_OLIGO_A_24_P30314	CYP11B1	Cytochrome P450, family 11, subfamily B, polypeptide 1	NM_000497	1584	0.04343043
AGL_HUM1_OLIGO_A_23_P168928	CSAG2	CSAG family, member 2	NM_004909	9598	0.04350798
AGL_HUM1_OLIGO_A_24_P567298	FLJ13842	Hypothetical protein FLJ13842	NM_024645	79698	0.04353467
AGL_HUM1_OLIGO_A_32_P164593		CDNA clone IMAGE:5288145, partial cds	CR625518		0.0436705
AGL_HUM1_OLIGO_A_32_P118532	XK	Kell blood group precursor (McLeod phenotype)	NM_021083	7504	0.04373896
AGL_HUM1_OLIGO_A_23_P45304	HDAC11	Histone deacetylase 11	NM_024827	79885	0.04377807
AGL_HUM1_OLIGO_A_23_P155360			THC2404842		0.04377807
AGL_HUM1_OLIGO_A_32_P107833			ENST00000354743		0.04382447
AGL_HUM1_OLIGO_A_23_P76059			NM_138353		0.04382447
AGL_HUM1_OLIGO_A_23_P50399					
AGL_HUM1_OLIGO_A_24_P269398	CASP2	Caspase 2, apoptosis-related cysteine protease (neural precursor cell expressed, developmentally down-regulated 2)	NM_032982	835	0.04426263
AGL_HUM1_OLIGO_A_23_P96990	NVL	Nuclear VCP-like	NM_002533	4931	0.04449602
AGL_HUM1_OLIGO_A_23_P142671	ZNF513	Zinc finger protein 513	NM_144631	130557	0.04484926
AGL_HUM1_OLIGO_A_32_P192922	LOC157562	Hypothetical protein LOC157562	AL050061	157562	0.04506291
AGL_HUM1_OLIGO_A_24_P333357	RAB40C	RAB40C, member RAS oncogene family	AK090463	57799	0.04506291
AGL_HUM1_OLIGO_A_23_P210619	C20orf43	Chromosome 20 open reading frame 43	NM_016407	51507	0.04506291
AGL_HUM1_OLIGO_A_23_P143559	CLTCL1	Clathrin, heavy polypeptide-like 1	NM_007098	8218	0.04506291
AGL_HUM1_OLIGO_A_32_P134209			THC2403913		0.04506291
AGL_HUM1_OLIGO_A_23_P205370	ASB2	Ankyrin repeat and SOCS box-containing 2	NM_016150	51676	0.04509918
AGL_HUM1_OLIGO_A_23_P67299	DOCK6	Dedicator of cytokinesis 6	NM_020812	57572	0.04509918
AGL_HUM1_OLIGO_A_23_P153651	FSD1	Fibronectin type 3 and SPRY domain containing 1	NM_024333	79187	0.04509918
AGL_HUM1_OLIGO_A_23_P22744	PAGE-5	PAGE-5 protein	NM_130467	90737	0.04509918
AGL_HUM1_OLIGO_A_23_P208158	DTNA	Dystrobrexin, alpha	NM_001392	1837	0.04509918
AGL_HUM1_OLIGO_A_32_P133926			A_32_P133926		0.04509918
AGL_HUM1_OLIGO_A_24_P298946			A_24_P298946		0.04542651
AGL_HUM1_OLIGO_A_32_P19840			CK300181	402617	0.04542651
AGL_HUM1_OLIGO_A_23_P389897	NGFR	Hypothetical LOC402617	NM_002507	4804	0.04574742
AGL_HUM1_OLIGO_A_24_P383440	KIAA0033	Nerve growth factor receptor (TNFR superfamily, member 16)	BC035034	23027	0.04673016
AGL_HUM1_OLIGO_A_32_P42780			THC2338292		0.04673016
AGL_HUM1_OLIGO_A_23_P206454	MGCI6385	Hypothetical protein MGCI6385	NM_145039	92806	0.04673016
AGL_HUM1_OLIGO_A_24_P332971	RPL7L1	Ribosomal protein L7-like 1	NM_198486	285855	0.04673016
AGL_HUM1_OLIGO_A_24_P576445			AK098124		0.04676639
AGL_HUM1_OLIGO_A_23_P125096	MT1X	Metallothionein 1X	NM_005952	4501	0.04676639
AGL_HUM1_OLIGO_A_23_P118135	HNRPM	Heterogeneous nuclear ribonucleoprotein M	THC2308359	4670	0.04676639
AGL_HUM1_OLIGO_A_23_P16615			NM_005968		0.04676639
AGL_HUM1_OLIGO_A_24_P416961	ARVCF	Armadillo repeat gene deletes in velocardiofacial syndrome	NM_001670	421	0.04676639

Table 2 - FDR for Comparison of Baseline Arm and Back Samples Between Responders and Non-Responders

Agilent Probe ID	Gene Symbol	Gene Name	Accession	Entrez Gene ID	FDR
AGL_HUM1_OLIGO_A_23_P107432	FLJ35934	FLJ35934 protein	NM_207453	400579	0.04676639
AGL_HUM1_OLIGO_A_24_P270424	DPF3	D4, zinc and double PHD fingers, family 3	AK124946	8110	0.04676639
AGL_HUM1_OLIGO_A_23_P12603	RNF153	Ring finger protein 153	NM_017824	54708	0.04676639
AGL_HUM1_OLIGO_A_23_P333218			NM_001031711		0.04676639
AGL_HUM1_OLIGO_A_32_P47616			AW994273		0.04681701
AGL_HUM1_OLIGO_A_23_P7144	CXCL1	Chemokine (C-X-C motif) ligand 1 (melanoma growth stimulating activity, alpha)	NM_001511	2919	0.04688504
AGL_HUM1_OLIGO_A_23_P500244	TRPV1	Transient receptor potential cation channel, subfamily V, member 1	NM_080706	7442	0.04688504
AGL_HUM1_OLIGO_A_23_P96302	SPANX2	SPANX family, member A2	NM_013453	64650	0.04688504
AGL_HUM1_OLIGO_A_23_P350005	FLJ25801	Hypothetical protein FLJ25801	NM_173553	205860	0.04688504
AGL_HUM1_OLIGO_A_23_P309739	ESR1	Estrogen receptor 1	NM_000125	2099	0.04688504
AGL_HUM1_OLIGO_A_24_P945283	DLG3	Discs, large homolog 3 (neuroendocrine-dlg, Drosophila)	AB033058	1741	0.04688504
AGL_HUM1_OLIGO_A_23_P218237	LCAT	Lecithin-cholesterol acyltransferase	NM_000229	3931	0.04688504
AGL_HUM1_OLIGO_A_23_P19036	TNIP1	TNFAIP3 interacting protein 1	NM_006058	10318	0.04688504
AGL_HUM1_OLIGO_A_23_P409168	KIAA0540	KIAA0540 protein	AK131104	23218	0.04688504
AGL_HUM1_OLIGO_A_23_P141946	LTBP4	Latent transforming growth factor beta binding protein 4	NM_003573	8425	0.0472703
AGL_HUM1_OLIGO_A_23_P404005	MGC29729	Hypothetical protein MGC29729	NM_152274	92002	0.0472703
AGL_HUM1_OLIGO_A_32_P99690			ENST00000380985		0.0472703
AGL_HUM1_OLIGO_A_32_P46313			CE529502		0.04754191
AGL_HUM1_OLIGO_A_24_P7085			NR_002778		0.04774837
AGL_HUM1_OLIGO_A_32_P220591	HCG8	HLA complex group 8	THC2415124		0.04774837
AGL_HUM1_OLIGO_A_24_P931845	TUB	Tubby homolog (mouse)	AY358246	80869	0.04815713
AGL_HUM1_OLIGO_A_23_P500892	FLJ23441	Hypothetical protein FLJ23441	NM_003320	7275	0.04823615
AGL_HUM1_OLIGO_A_23_P24960	RNASE3L	Nuclear RNase III Drosha	NM_024678	79731	0.04823615
AGL_HUM1_OLIGO_A_23_P133596	KIAA0859	KIAA0859	NM_013235	29102	0.04823615
AGL_HUM1_OLIGO_A_23_P201672			NM_015935	51603	0.04823615
AGL_HUM1_OLIGO_A_24_P562242			A_24_P562242		0.04866814
AGL_HUM1_OLIGO_A_32_P132276			BE091362		0.04869837
AGL_HUM1_OLIGO_A_32_P212654			BU616488		0.04869837
AGL_HUM1_OLIGO_A_24_P525749	ABR	Homo sapiens, clone IMAGE:4214962, mRNA	AK091547		0.04872217
AGL_HUM1_OLIGO_A_23_P503182		Active BCR-related gene	NM_021962	29	0.04875589
AGL_HUM1_OLIGO_A_32_P155026	PHF17	PHD finger protein 17	ENST00000371189		0.04875589
AGL_HUM1_OLIGO_A_23_P167256	C20orf140	Chromosome 20 open reading frame 140	AK127326	79960	0.04894323
AGL_HUM1_OLIGO_A_24_P392958	SOX4	SRY (sex determining region Y)-box 4	BX647370	128637	0.04894323
AGL_HUM1_OLIGO_A_32_P96752			AW946823	6659	0.04894323
AGL_HUM1_OLIGO_A_23_P215832	ATP5J2	ATP synthase, H+ transporting, mitochondrial F0 complex, subunit f, isoform 2	NM_004889	9551	0.04894323
AGL_HUM1_OLIGO_A_32_P1587	ACYP2	Acylphosphatase 2, muscle type	BQ066852	98	0.04894323
AGL_HUM1_OLIGO_A_24_P99216	LRP10	Low density lipoprotein receptor-related protein 10	NM_014045	26020	0.04894323
AGL_HUM1_OLIGO_A_23_P72627	HGS	Hepatocyte growth factor-regulated tyrosine kinase substrate	NM_004712	9146	0.04897374
AGL_HUM1_OLIGO_A_32_P132827			ENST00000355520		0.04902203
AGL_HUM1_OLIGO_A_32_P192692			NM_001014797		0.04902203
AGL_HUM1_OLIGO_A_23_P68059	NSPC1	Likely ortholog of mouse nervous system polycomb 1	NM_032673	84759	0.04902203
AGL_HUM1_OLIGO_A_23_P130731	TBC1D17	TBC1 domain family, member 17	NM_024682	79735	0.04902203
AGL_HUM1_OLIGO_A_23_P217178	MAGEC1	Melanoma antigen, family C, 1	NM_005462	9947	0.04902203
AGL_HUM1_OLIGO_A_23_P204511	FLJ20489	Hypothetical protein FLJ20489	NM_017842	55652	0.04902203
AGL_HUM1_OLIGO_A_23_P85140	TCEAL2	Transcription elongation factor A (SII)-like 2	NM_080390	140597	0.04902203
AGL_HUM1_OLIGO_A_24_P136661			BC025971	84310	0.04902203
AGL_HUM1_OLIGO_A_32_P182186	MGC11257	Hypothetical protein MGC11257	BC041955		0.04902203

Table 2 - FDR for Comparison of Baseline Arm and Back Samples Between Responders and Non-Responders

Agilent Probe ID	Gene Symbol	Gene Name	Accession	Entrez Gene ID	FDR
AGL_HUM1_OLIGO_A_32_P81674	LOC157627	Hypothetical protein LOC157627	AK091593	157627	0.04902203
AGL_HUM1_OLIGO_A_23_P167537	CPLX2	Complexin 2	NM_006650	10814	0.04902203
AGL_HUM1_OLIGO_A_23_P202881	FEZ1	Fasciculation and elongation protein zeta 1 (zyg1)	NM_005103	9638	0.04902203
AGL_HUM1_OLIGO_A_24_P412486		Similar to RIKEN cDNA 8030451K01	CR601315	387921	0.04902203
AGL_HUM1_OLIGO_A_32_P77742			THC2338229		0.04902203
AGL_HUM1_OLIGO_A_23_P74887	SDC3	Syndecan 3 (N-syndecan)	AB007937	9672	0.04902203
AGL_HUM1_OLIGO_A_23_P95764	PRPS1	Phosphoribosyl pyrophosphate synthetase 1	NM_002764	5631	0.04902203
AGL_HUM1_OLIGO_A_23_P107166	ACBD4	Acyl-Coenzyme A binding domain containing 4	NM_024722	79777	0.04915923
AGL_HUM1_OLIGO_A_23_P42435	DTNBP1	Dystrobrevin binding protein 1	NM_183041	84062	0.04925664
AGL_HUM1_OLIGO_A_32_P194915			THC2449703		0.04965406
AGL_HUM1_OLIGO_A_32_P154079	TGFB114	Transforming growth factor beta 1 induced transcript 4	AL533377	8848	0.0499513
AGL_HUM1_OLIGO_A_24_P47467	MGC5508	Hypothetical protein MGC5508	NM_024092	79073	0.0499513

WHAT IS CLAIMED IS:

1. A method of determining if a patient having Systemic Sclerosis (SSc) or scleroderma is a responder to mycophenolate mofetil (MMF) treatment or a non-responder to MMF treatment, comprising (a) comparing a gene expression signature obtained from skin of a patient having SSc or scleroderma to a gene expression signature that is characteristic of a responder to MMF treatment and (b) based on results of comparing in (a), determining if the patient is a responder or a non-responder to MMF treatment.
2. The method of claim 1, wherein the gene expression signature is obtained from skin that is a skin sample obtained from the arm of the patient or from the back of the patient.
3. The method of claim 1, wherein in (a), the gene expression signature obtained from skin of the patient is compared with a gene expression signature characteristic of a responder to MMF treatment that comprises altered expression of one or more genes in Group III, altered expression of one or more genes in Group II, altered expression of one or more genes in Group I or a combination thereof and comparing shows that the gene expression signature obtained from skin of the patient comprises altered expression of one or more genes in Group III, altered expression of one or more genes in Group II, altered expression of one or more genes in Group III or any combination of the three and the patient having SSc is determined to be a responder to MMF treatment.
4. The method of claim 2, wherein:
 - (a) Group III comprises: genes identified by name: A2M, AIF1, ALOX5AP, APOL2, APOL3, BATF, BCL3, BIRC1, BTN3A2, C10orf10, C1orf38, C6orf80, CCL2, CCL4, CCR5, CD8A, CDW52, COL6A3, COTL1, CPA3, CPVL, CTAG1B, DDX58, EBI2, EVI2B, F13A1, FAM20A, FAP, FCGR3A, FLJ11259, FLJ22573, FLJ23221, FLJ25200, FYB, GBP1, GBP3, GEM, GIMAP6, GMFG, GZMH, GZMK, HAVCR2, HCLS1, HLA-DMA, HLA-DOA, HLA-DPA1, HLA-DPB1, HLA-DQA1, HLA-DQA2, HLA-DQB1, HLA-DRB1, HLA-DRB5, ICAM2, IFI16, IFI16, IFIT1, IFIT2, IFITM1, IFITM2, IFITM3, IL10RA, INDO, ITGB2, KIAA0063, LAMB1, LCP1, LGALS2, LGALS9, LILRB2, LOC387763, LOC400759, LUM, LYZ, MARCKS, MFNG,

MGC24133, MPEG1, MRC1, MRCL3, MS4A6A, MX1, NNMT, NUP62, PAG, PLAUI, PPIC, PPIC, PTPRC, RAC2, RGS10, RGS16, RSAFD1, SAT, SCGB2A1, SLC20A1, SLCO2B1, SPARC, SULF1, TAP1, TCTEL1, TIMP1, TNFSF4, UBD, VSIG4, and ZFYVE26 and genes, each identified by GenBank accession number: AF533936, BQ049338, ENST00000310210, ENST00000313904, ENST00000329660, I_1000437, I_966691, M15073, NM_001010919, NM_001025201, NM_001033569, THC1543691, and XM_291496 and the altered expression is increased expression;

(b) Group II comprises genes, identified by name: AADAC, ADAM17, ADH1A, ADH1C, AHNAK, ALG1, ALG5, AMOT, AOX1, AP2A2, ARK5, ARL6IP5, ARMCX1, BECN1, BECN1, BMP8A, BNIP3L, C10orf119, C1orf24, C1orf37, C20orf10, C20orf22, C5orf14, C6orf64, C9orf61, CAPS, CASP4, CASP5, CAST, CAV2, CCDC6, CCNG2, CDC26, CDK2AP1, CDR1, CFHL1, CNTN3, CPNE5, CRTAP, CTNNA1, CTSC, CUTL1, CXCL5, CYBRD1, CYP2R1, DBN1, DCAMKL1, DCL-1, DIAPH2, DKK2, ECHDC3, ECM2, EIF3S7, EMB, EMCN, EMILIN2, ENPP2, EPB41L2, FBLN1, FBLN2, FEM1A, FGL2, FHL5, FKBP7, FLI1, FLJ10986, FLJ20032, FLJ20701, FLJ23861, FLJ34969, FLJ36748, FLJ36888, FLJ43339, FZR1, GABPB2, GARNL4, GHITM, GHR, GIT2, GLYAT, GPM6B, GTPBP5, HELB, HOXB4, IFNA6, IGFBP5, IL13RA1, IL15, KAZALD1, KCNK4, KCNS3, KCTD10, KIAA0232, KIAA0494, KIAA0562, KIAA0870, KIAA1190, KIF25, KLHL18, KLK2, LAMP2, LEPROTL1, LHFP, LMO2, LOC114990, LOC255458, LOC387680, LOC400027, LOC493869, LOC87769, LRBA, MAFB, MAGEH1, MAN2B2, MCCC2, MEGF10, MFAP5, MGC11308, MGC15523, MGC3200, MGC35048, MGC45780, MOGAT3, MPPE1, MPZ, MYO1B, MYOC, NFYC, NIPSNAP3B, OPTN, OSR2, PAM, PBXIP1, PCOLCE2, PDGFC, PDGFRA, PDGFRL, PEX19, PHAX, PIP, PKM2, PKP2, PMP22, POU2F1, PPAP2B, PRAC, PSMA5, PSORS1C1, PTGIS, RECK, RGS11, RGS5, RIMS3, RIPK2, RNASE4, RNF125, RNF13, RNF146, RNF19, ROBO1, ROBO3, RPL7A, SARA1, SAV1, SCGB1D1, SDK1, SECP43, SECTM1, SERPINB2, SGCA, SH3BGRL, SH3GLB1, SH3RF2, SLC10A3, SLC12A2, SLC14A1, SLC39A14, SLC7A7, SLC9A9, SLPI, SMAD1, SMAP1, SMARCE1, SMP1, SNTG2, SNX7, SOCS5, SSPN, STX7, SUMF1, TAS2R10, TDE2, TFAP2B, TGFB2, THSD2, TM4SF3, TMEM25, TMEM34, TNA, TNKS2, TRAD, TRAF3IP1, TREM4, TRIM35,

TRIM9, TTYH2, TUBB1, UBL3, ULK2, URB, USP54, UST, UTRN, UTX, WIF1, WWOX, XG, YPEL5, and ZFHX1B and genes, each identified by GenBank accession number only: A_32_BS169243, A_32_BS200773, A_32_BS53976, AC025463, AF124368, AF161364, AF318337, AF372624, AK001565, AK022793, AK055621, AK056856, AL050042, AL137761, BC035102, BC038761, BC039664, BG252130, BI014689, D80006, ENST00000298643, ENST00000300068, ENST00000305402, ENST00000307901, ENST00000321656, ENST00000322803, ENST00000329246, ENST00000331640, ENST00000332271, ENST00000333784, H16080, I_1861543, I_1882608, I_1985061, I_3335767, I_3551568, I_3588329, I_932413, I_962800, I_966091, NM_001008528, NM_001009555, NM_001013632, NM_001014975, NM_001018006, NM_001018076, NM_001025077, NM_003671, NM_014758, NM_015262, NM_138411, NM_153030, NM_173709, NM_213595, NR_002184, S62210, THC1419743, THC1429821, THC1457118, THC1459712, THC1461073, THC1506312, THC1511927, THC1515028, THC1525318, THC1531579, THC1544941, THC1551463, THC1559236, THC1560798, THC1563147, THC1572906, THC1574967, THC1591470, XM_165930, and XM_209429 and altered expression is increased expression; and

(c) Group I comprises genes, each identified by name: ANP32A, APOH, ATAD2, B3GALT6, B3GAT3, C12orf14, C14orf131, CACNG6, CBLL1, CBX8, CDC7, CDT1, CENPE, CGI-90, CLDN6, CREB3L3, CROC4, DDX3Y, DERP6, DJ971N18.2, EHD2, ESPL1, FGF5, FLJ10902, FLJ12438, FLJ12443, FLJ12484, FLJ12572, FLJ20245, FLJ32009, FLJ35757, FXYD2, GABRA2, GATA2, GK, GSG2, HPS3, IKBKG, IL23A, INSIG1, KIAA1509, KIAA1609, KIAA1666, LDLR, LGALS8, LILRB5, LOC123876, LOC128977, LOC153561, LOC283464, LRRIQ2, LY6K, MAC30, ME2, MGC13186, MGC16044, MGC16075, MGC29784, MGC33839, MGC35212, MGC4293, MICB, MLL5, MTRF1L, MUC20, NICN1, NPTX1, OAS3, OGDHL, OPRK1, PCNT2, PDZK1, PITPNC1, PPFIA4, PREB, PRKY, PSMD11, PSPH, PSPHL, PTP4A3, PXMP2, RAB15, RAD51AP1, RIP, RNF121, RPL41, RPS18, RPS4Y1, RPS4Y2, S100P, SORD, SP1, SYMPK, SYT6, TM9SF4, TMOD3, TNFRSF12A, TPRA40, TRIP, TRPM7, TTR, TUBB4, VARS2L, ZNF572, and ZSCAN2 and genes, each identified by GenBank accession number: A_24_BS934268, AB065507, AC007051, AI791206, AK022745,

AK022893, AK022997, AK094044, AL391244, AL731541, AL928970, BC010544, BC020847, BM925639, BM928667, ENST00000328708, ENST00000333517, I_1891291, I_3580313, NM_001009569, NM_001024808, NM_172020, NM_173705, NM_178467, NR_001544, THC1434038, THC1484458, THC1504780, U62539, XM_210579, XM_303638, and XM_371684 and altered expression is decreased expression.

5. The method of claim 1, wherein the gene expression signature that is characteristic of a responder to MMF treatment comprises: genes, each identified by name: A2M, AIF1, ALOX5AP, APOL2, APOL3, BATF, BCL3, BIRC1, BTN3A2, C10orf10, C1orf38, C6orf80, CCL2, CCL4, CCR5, CD8A, CDW52, COL6A3, COTL1, CPA3, CPVL, CTAG1B, DDX58, EBI2, EVI2B, F13A1, FAM20A, FAP, FCGR3A, FLJ11259, FLJ22573, FLJ23221, FLJ25200, FYB, GBP1, GBP3, GEM, GIMAP6, GMFG, GZMH, GZMK, HAVCR2, HCLS1, HLA-DMA, HLA-DOA, HLA-DPA1, HLA-DPB1, HLA-DQA1, HLA-DQA2, HLA-DQB1, HLA-DRB1, HLA-DRB5, ICAM2, IFI16, IFIT1, IFIT2, IFITM1, IFITM2, IFITM3, IL10RA, INDO, ITGB2, KIAA0063, LAMB1, LCP1, LGALS2, LGALS9, LILRB2, LOC387763, LOC400759, LUM, LYZ, MARCKS, MFNG, MGC24133, MPEG1, MRC1, MRCL3, MS4A6A, MX1, NNMT, NUP62, PAG, PLAU, PPIC, PTPRC, RAC2, RGS10, RGS16, RSAFD1, SAT, SCGB2A1, SLC20A1, SLCO2B1, SPARC, SULF1, TAP1, TCTEL1, TIMP1, TNFSF4, UBD, VSIG4, and ZFYVE26 and genes, each identified by GenBank accession number: AF533936, BQ049338, ENST00000310210, ENST00000313904, ENST00000329660, I_1000437, I_966691, M15073, NM_001010919, NM_001025201, NM_001033569, THC1543691, and XM_291496 and the altered expression is increased expression.
6. The method of claim 1, wherein in (a), the gene expression signature obtained from skin of the patient is compared with a gene expression signature characteristic of a non-responder to MMF treatment.
7. A method of determining if a patient having Systemic Sclerosis (SSc) or scleroderma is a responder to mycophenolate mofetil (MMF) treatment or a non-responder to MMF treatment,

comprising (a) comparing a gene expression signature obtained from skin of a patient having SSc or scleroderma to a gene expression signature standard that is characteristic of a responder to MMF treatment and (b) based on results of comparing in (a), determining if the patient is a responder or a non-responder to MMF treatment, wherein the gene expression signature of a responder to MMF treatment comprises one or more genes listed in Table 1, Table 1A, Table 2, Table 3, Table 4, Table 5 or Figure 1, and wherein the difference in expression of the one or more genes between the patient and the standard is statistically significant.

8. A method of determining if a patient having Systemic Sclerosis (SSc) or scleroderma is a responder to mycophenolate mofetil (MMF) treatment or a non-responder to MMF treatment, comprising:
 - (a) measuring expression of one or more genes selected from the group consisting of: A2M, AIF1, ALOX5AP, APOL2, APOL3, BATF, BCL3, BIRC1, BTN3A2, C10orf10, C1orf38, C6orf80, CCL2, CCL4, CCR5, CD8A, CDW52, COL6A3, COTL1, CPA3, CPVL, CTAG1B, DDX58, EBI2, EVI2B, F13A1, FAM20A, FAP, FCGR3A, FLJ11259, FLJ22573, FLJ23221, FLJ25200, FYB, GBP1, GBP3, GEM, GIMAP6, GMFG, GZMH, GZMK, HAVCR2, HCLS1, HLA-DMA, HLA-DOA, HLA-DPA1, HLA-DPB1, HLA-DQA1, HLA-DQA2, HLA-DQB1, HLA-DRB1, HLA-DRB5, ICAM2, IFI16, IFIT1, IFIT2, IFITM1, IFITM2, IFITM3, IL10RA, INDO, ITGB2, KIAA0063, LAMB1, LCP1, LGALS2, LGALS9, LILRB2, LOC387763, LOC400759, LUM, LYZ, MARCKS, MFNG, MGC24133, MPEG1, MRC1, MRCL3, MS4A6A, MX1, NNMT, NUP62, PAG, PLAU, PPIC, PTPRC, RAC2, RGS10, RGS16, RSAFD1, SAT, SCGB2A1, SLC20A1, SLCO2B1, SPARC, SULF1, TAP1, TCTEL1, TIMP1, TNFSF4, UBD, VSIG4, and ZFYVE26 and genes, each identified by GenBank accession number: AF533936, BQ049338, ENST00000310210, ENST00000313904, ENST00000329660, I_1000437, I_966691, M15073, NM_001010919, NM_001025201, NM_001033569, THC1543691 and XM_291496 in a skin sample obtained from a patient having Systemic Sclerosis (SSc) or scleroderma; and
 - (b) comparing expression of the one or more genes measured in (a) with expression of the corresponding one or more genes in a standard, wherein if expression of the one or more

genes measured in (a) is increased relative to the standard, the patient is a responder to MMF treatment and if expression of the one or more genes measured in (a) is not increased relative to the standard, the patient is a non-responder to MMF treatment.

9. The method of claim 8, wherein measuring in (a) comprises obtaining nucleic acids from the skin sample; hybridizing nucleic acids obtained with a microarray comprising nucleic acid capable of hybridizing with at least one of the one or more of the genes in (a); and determining if hybridization occurs, wherein if hybridization occurs, at least one of the one or more genes is present in the skin sample.

10. The method of claim 8, further comprising:

- (c) measuring expression of one or more genes selected from the group consisting of: genes, identified by name: AADAC, ADAM17, ADH1A, ADH1C, AHNAK, ALG1, ALG5, AMOT, AOX1, AP2A2, ARK5, ARL6IP5, ARMCX1, BECN1, BECN1, BMP8A, BNIP3L, C10orf119, C1orf24, C1orf37, C20orf10, C20orf22, C5orf14, C6orf64, C9orf61, CAPS, CASP4, CASP5, CAST, CAV2, CCDC6, CCNG2, CDC26, CDK2AP1, CDR1, CFHL1, CNTN3, CPNE5, CRTAP, CTNNA1, CTSC, CUTL1, CXCL5, CYBRD1, CYP2R1, DBN1, DCAMKL1, DCL-1, DIAPH2, DKK2, ECHDC3, ECM2, EIF3S7, EMB, EMCN, EMILIN2, ENPP2, EPB41L2, FBLN1, FBLN2, FEM1A, FGL2, FHL5, FKBP7, FLI1, FLJ10986, FLJ20032, FLJ20701, FLJ23861, FLJ34969, FLJ36748, FLJ36888, FLJ43339, FZR1, GABPB2, GARNL4, GHITM, GHR, GIT2, GLYAT, GPM6B, GTPBP5, HELB, HOXB4, IFNA6, IGFBP5, IL13RA1, IL15, KAZALD1, KCNK4, KCNS3, KCTD10, KIAA0232, KIAA0494, KIAA0562, KIAA0870, KIAA1190, KIF25, KLHL18, KLK2, LAMP2, LEPROTL1, LHFP, LMO2, LOC114990, LOC255458, LOC387680, LOC400027, LOC493869, LOC87769, LRBA, MAFB, MAGEH1, MAN2B2, MCCC2, MEGF10, MFAP5, MGC11308, MGC15523, MGC3200, MGC35048, MGC45780, MOGAT3, MPPE1, MPZ, MYO1B, MYOC, NFYC, NIPSNAP3B, OPTN, OSR2, PAM, PBXIP1, PCOLCE2, PDGFC, PDGFRA, PDGFRL, PEX19, PHAX, PIP, PKM2, PKP2, PMP22, POU2F1, PPAP2B, PRAC, PSMA5, PSORS1C1, PTGIS, RECK, RGS11, RGS5, RIMS3, RIPK2, RNASE4, RNF125, RNF13, RNF146, RNF19, ROBO1, ROBO3, RPL7A, SARA1, SAV1,

SCGB1D1, SDK1, SECP43, SECTM1, SERPINB2, SGCA, SH3BGRL, SH3GLB1, SH3RF2, SLC10A3, SLC12A2, SLC14A1, SLC39A14, SLC7A7, SLC9A9, SLPI, SMAD1, SMAP1, SMARCE1, SMP1, SNTG2, SNX7, SOCS5, SSPN, STX7, SUMF1, TAS2R10, TDE2, TFAP2B, TGFBR2, THSD2, TM4SF3, TMEM25, TMEM34, TNA, TNKS2, TRAD, TRAF3IP1, TREM4, TRIM35, TRIM9, TTYH2, TUBB1, UBL3, ULK2, URB, USP54, UST, UTRN, UTX, WIF1, WWOX, XG, YPEL5, and ZFHX1B and genes, each identified by GenBank accession number only: A_32_BS169243, A_32_BS200773, A_32_BS53976, AC025463, AF124368, AF161364, AF318337, AF372624, AK001565, AK022793, AK055621, AK056856, AL050042, AL137761, BC035102, BC038761, BC039664, BG252130, BI014689, D80006, ENST00000298643, ENST00000300068, ENST00000305402, ENST00000307901, ENST00000321656, ENST00000322803, ENST00000329246, ENST00000331640, ENST00000332271, ENST00000333784, H16080, I_1861543, I_1882608, I_1985061, I_3335767, I_3551568, I_3588329, I_932413, I_962800, I_966091, NM_001008528, NM_001009555, NM_001013632, NM_001014975, NM_001018006, NM_001018076, NM_001025077, NM_003671, NM_014758, NM_015262, NM_138411, NM_153030, NM_173709, NM_213595, NR_002184, S62210, THC1419743, THC1429821, THC1457118, THC1459712, THC1461073, THC1506312, THC1511927, THC1515028, THC1525318, THC1531579, THC1544941, THC1551463, THC1559236, THC1560798, THC1563147, THC1572906, THC1574967, THC1591470, XM_165930, and XM_209429;

(d) measuring the expression of at least one or more genes selected from the group consisting of: genes, each identified by name: ANP32A, APOH, ATAD2, B3GALT6, B3GAT3, C12orf14, C14orf131, CACNG6, CBLL1, CBX8, CDC7, CDT1, CENPE, CGI-90, CLDN6, CREB3L3, CROC4, DDX3Y, DERP6, DJ971N18.2, EHD2, ESPL1, FGF5, FLJ10902, FLJ12438, FLJ12443, FLJ12484, FLJ12572, FLJ20245, FLJ32009, FLJ35757, FXYP2, GABRA2, GATA2, GK, GSG2, HPS3, IKBKG, IL23A, INSIG1, KIAA1509, KIAA1609, KIAA1666, LDLR, LGALS8, LILRB5, LOC123876, LOC128977, LOC153561, LOC283464, LRRIQ2, LY6K, MAC30, ME2, MGC13186, MGC16044, MGC16075, MGC29784, MGC33839, MGC35212, MGC4293, MICB, MLL5, MTRF1L, MUC20, NICN1, NPTX1, OAS3, OGDHL, OPRK1, PCNT2, PDZK1,

PITPNC1, PPFIA4, PREB, PRKY, PSMD11, PSPH, PSPHL, PTP4A3, PXMP2, RAB15, RAD51AP1, RIP, RNF121, RPL41, RPS18, RPS4Y1, RPS4Y2, S100P, SORD, SP1, SYMPK, SYT6, TM9SF4, TMOD3, TNFRSF12A, TPRA40, TRIP, TRPM7, TTR, TUBB4, VARS2L, ZNF572, and ZSCAN2 and genes, each identified by GenBank accession number: A_24_BS934268, AB065507, AC007051, AI791206, AK022745, AK022893, AK022997, AK094044, AL391244, AL731541, AL928970, BC010544, BC020847, BM925639, BM928667, ENST00000328708, ENST00000333517, I_1891291, I_3580313, NM_001009569, NM_001024808, NM_172020, NM_173705, NM_178467, NR_001544, THC1434038, THC1484458, THC1504780, U62539, XM_210579, XM_303638, and XM_371684; and

(e) comparing expression of the one or more genes measured in (c) with expression of the corresponding one or more genes in a standard and expression of the one or more genes measured in (d) with expression of the corresponding one or more genes in a standard, wherein if expression of the one or more genes measured in (c) is increased relative to the standard and expression of the one or more genes measured in (d) is decreased relative to the standard, the patient is a responder to MMF treatment.

11. The method of claim 10, wherein measuring in (c) and in (d) comprises obtaining nucleic acids from the skin sample; hybridizing nucleic acids obtained with a microarray comprising nucleic acid capable of hybridizing with at least one of the one or more of the genes in (c) and/or (d); and determining if hybridization occurs, wherein if hybridization occurs, at least one of the one or more genes is present in the skin sample.
12. A microarray comprising nucleic acids that hybridize to at least one gene selected from Group III or to a complement of at least one gene selected from Group III, a gene selected from Group II or to a complement thereof, and a gene selected from Group I or to a complement thereof.

1/2

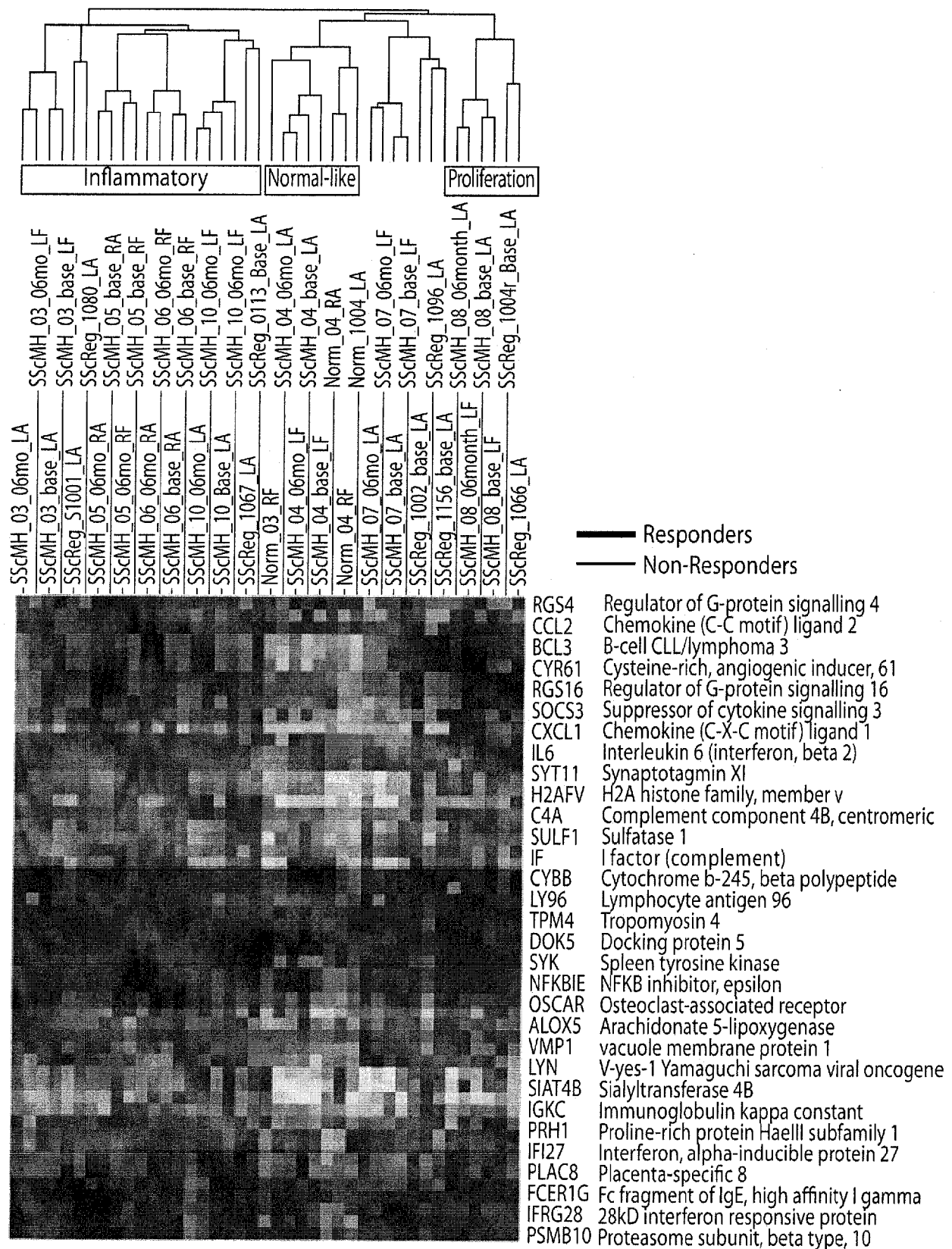


Fig. 1

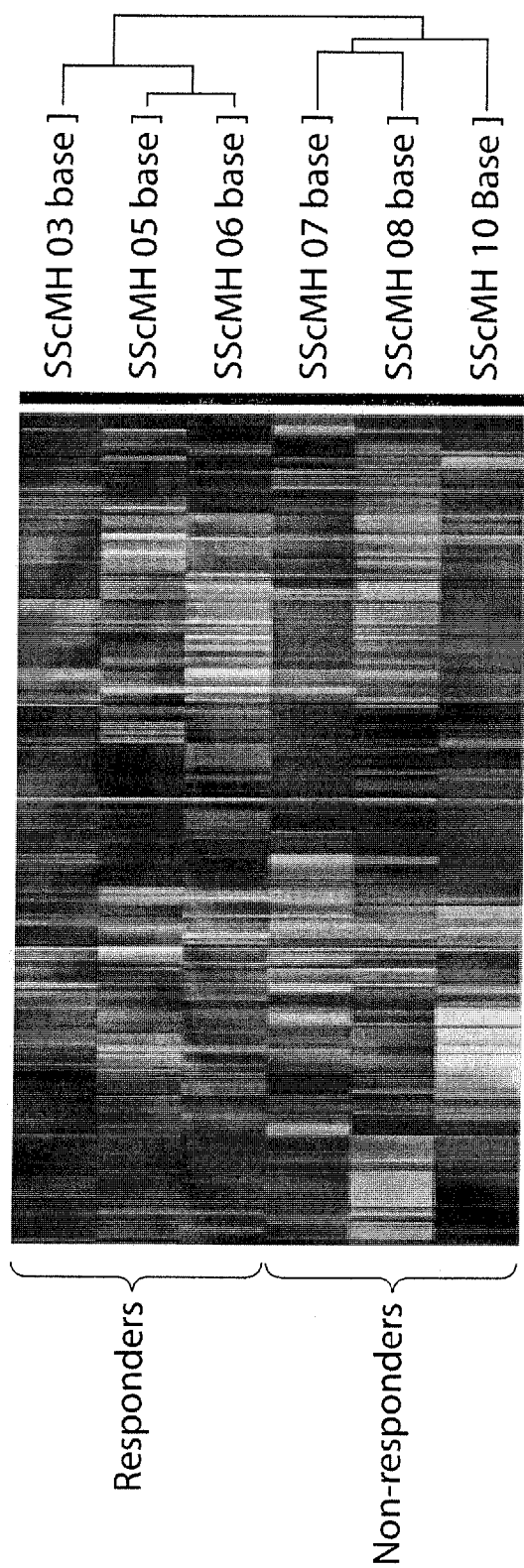


Fig. 2A

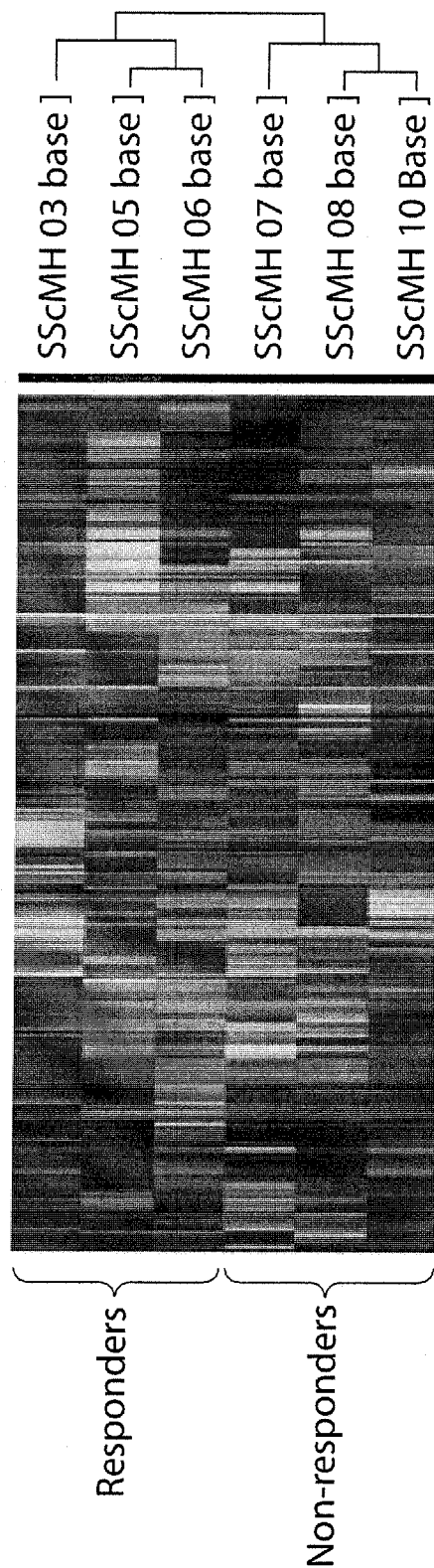


Fig. 2B

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 12/27020

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - G01N 33/48, 33/53 (2012.01)

USPC - 435/6.1, 7.1

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

USPC - 435/6.1, 7.1 IPC(8) - G01N 33/48, 33/53 (2012.01)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Dilaog Classic Files -- 2,6,35,64,144,155,315,371,344,347,348,349,654,652,345,351; Google Scholar; Google; USPTO Website Search terms -- mycophenolate, mofetil, sclerosis, scleroderma, cellcept, allograft, vasculopathy, systemic sclerosis, SSC, scleroderma, autoimmune, microarray, skin, arm, gene profile, gene expression, rodnan, mmf

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2010/0204058 A1 Chang et al. 12 August 2010 (12.08.2010); Table 2, para [0014], [0017], [0030], [0048], [0099], [0114]-[0116], [0125]-[0129], [0168]-[0170], [0181], [0183], [0184]	1-12
A	Milano et al. (2008) "Molecular Subsets in the Gene Expression Signatures of Scleroderma Skin" PLoS ONE; 16 July 2008; Vol. 3(7); document e2696. doi:10.1371/journal.pone.0002696.	1-12

☐ Further documents are listed in the continuation of Box C.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

11 May 2012 (11.05.2012)

Date of mailing of the international search report

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