

C04b	BLANK		
C04c	BLANK		
C04d	ras-like small GTPase TTF		Z3...../
C04e	rho6 protein		Y07923
C04f	RHO GDP-dissociation inhibitor 3 (RHO-GDI 3); RHO-GDI gamma; ARHGDI3		U82532
C04g	cytohesin-1; Sec7p-like protein		U59752
C04h	myeloid cell leukemia protein 1 (MCL1)		L98246
C04i	3-hydroxy-3-methylglutaryl-coenzyme A reductase (HMG-CoA reductase; HMGCR)		M11058
C04j	tumor necrosis factor superfamily member 5 (TNFSF5); CD40 ligand (CD40L); TNF-related activation protein (TRAP); gp39; hy		L07414
C04k	farnesyltransferase alpha		L10413
C04l	farnesyltransferase beta		L10414
C04m	GTPase-activating protein (GAP); ras p21 protein activator; p120GAP; RASA		M23379
C04n	rab geranylgeranyltransferase alpha subunit (rab GG transferase; rab GGTase)		Y08200
C05a	BLANK		
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C05d	rab geranylgeranyl transferase beta subunit		Y08201
C05e	geranylgeranyltransferase type 1 beta subunit (GGTase 1 beta; PGGT1B)		L25441
C05f	H-ras proto-oncogene; transforming G protein		V00574
C05g	v-Ki-RAS2B proto-oncogene (KRAS2)		M54968
C05h	laminin beta 1 subunit precursor (laminin B1; LAMB1)		M61916
C05i	laminin beta 2 subunit precursor (laminin B2; LAMB2); S-laminin		S77512
C05j	laminin beta 3 subunit precursor (LAMB3); laminin B1K chain; kalinin B1 chain		L25541
C05k	neurofibromatosis protein type 1 (NF1); neurofibromin		M60915
C05l	neuromodulin; growth-associated protein 43 (GAP43); protein F1; calmodulin-binding protein p57		M25667
C05m	n-ras proto-oncogene; transforming protein p21		X02751
C05n	progesterone receptor (PGR)		M15716
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C06b	BLANK		
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C06d	prostaglandin G/H synthase 2, precursor (PGH synthase 2; PQHS2; PTGS2); cyclooxygenase 2 (COX2); prostaglandin-endoper; M90100		M99487
C06e	prostate-specific membrane antigen (PSM)		X69141
C06f	farnesyl-diphosphate farnesyltransferase 1 (FDDT1); squalene synthetase (SQS; SS)		U09031 + U28170 + L19956
C06g	phenol-sulfating phenol sulfotransferase 1 (PPST1); thermostable phenol sulfotransferase (TS-PST); HAST1/HAST2; ST1A3; K02054		K02054
C06h	gastrin-releasing peptide (GRP)		M35262
C06i	farnesyl pyrophosphate synthetase (FPS); farnesyl diphosphate synthase (FDPS); dimethylallyltransferase; geranyltranstr; M13451		M13451
C06j	lamin C		AF071552
C06k	Homo sapiens N-acetyltransferase 1 (arylamine N-acetyltransferase) (NAT1) mRNA		AF128406
C06l	nuclear prelamin A, recognition factor (NARF)		X03541
C06m	neurotrophic tyrosine kinase receptor type 1 (NTRK1; TRK)		AF048700
C06n	gastrointestinal peptide		
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C07b	BLANK		
C07c	BLANK		
C07d	mitochondrial brown fat uncoupling protein 1 (UCP1)		U28480
C07e	guanine nucleotide-binding protein G(Y) alpha 11 subunit (GNA11)		M69013
C07f	peroxisome proliferator activated receptor alpha (PPAR-alpha; PPARA)		L02932
C07g	tyrosine 3-monooxygenase/tryptophan 5-monooxygenase activation protein epsilon polypeptide (YWHAE); 14-3-3 protein epsi		U28936
C07h	neuromedin B precursor (NMB)		M21551
C07i	lymphopain		AF013611
C07j	platelet/endothelial cell adhesion molecule 1 (PECAM1); CD31 antigen		M28526
C07k	alpha1 catenin (CTNNA1); cadherin-associated protein; alpha E-catenin		D13866; D14705; L23805; L22080
C07l	beta 1 catenin (CTNNB); cadherin-associated protein		X87838; Z19054
C07m	cathepsin D precursor (CTSD)		M11233
C07n	cathepsin B precursor (CTSB); APP secretase		M14221
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C08c	BLANK		
C08d	endoglin precursor (ENG; END); CD105 antigen		J05481; X72012
C08e	selectin E precursor (SELE; ESEL); endothelial leukocyte adhesion molecule 1 (ELAM1)		M30640; M61893
C08f	hepatocyte growth factor (HGF); scatter factor (SF); hepatopoietin A		M60718
C08g	integrin alpha 7B precursor (IGA7B)		X74295
C08h	integrin beta 4 precursor (ITGB4); CD104 antigen		X53587; X52186; X51841

C08i	integrin alpha 1 (ITGA1); laminin & collagen receptor; VLA1; CD49A antigen	
C08j	integrin alpha 4 precursor (ITGA4); VLA4; CD49D antigen	X68742
C08k	integrin alpha 6 precursor (ITGA6); VLA6; CD49F antigen	L12002; X16983; X15356
C08l	integrin alpha 8 (ITGA8)	X53586; X59512
C08m	integrin alpha 9 (ITGA9); integrin alpha-RLC	L36531
C08n	integrin alpha E precursor (ITGAE); mucosal lymphocyte-1 antigen; hml-1 antigen; CD103 antigen	D25303; L24158
C09a	BLANK	L25851
C09b	BLANK	
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C09d	integrin beta 1 (ITGB1)	M34189
C09e	integrin beta 5 precursor (ITGB5)	J05633
C09f	integrin beta 6 precursor (ITGB6)	M35198; J05522
C09g	integrin beta 7 precursor (ITGB7)	M62880; S80335
C09h	integrin beta 8 precursor (ITGB8)	M73780
C09i	laminin gamma 1 subunit precursor (LAMC1); laminin B2 subunit (LAMB2)	J03202
C09j	laminin gamma 2 subunit precursor (LAMC2)	Z15009
C09k	matrix metalloproteinase 1 (MMP1); interstitial collagenase precursor (CLG); fibroblast collagenase	X05231
C09l	matrix metalloproteinase 10 (MMP10); stromelysin 2 precursor (STMY2; SL2); transin 2	X07820; M30461
C09m	matrix metalloproteinase 7 (MMP7); matrilysin	X07819
C09n	matrix metalloproteinase 12 (MMP12)	L23808
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C10b	BLANK	
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C10d	matrix metalloproteinase 13 (MMP13); collagenase 3 precursor	X75308
C10e	matrix metalloproteinase 14 precursor (MMP14); MMP-X1; membrane-type matrix metalloproteinase 1 (MT-MMP1)	D26512; X83535
C10f	matrix metalloproteinase 15 (MMP15); membrane-type matrix metalloproteinase 2 (MT-MMP2)	Z48482
C10g	matrix metalloproteinase 16 (MMP16)	D83646
C10h	matrix metalloproteinase 16 precursor (MMP16); membrane-type matrix metalloproteinase 3 (MT-MMP3); MMP-X2	D50477
C10i	matrix metalloproteinase 17 (MMP17); membrane-type matrix metalloproteinase 4 (MT-MMP4)	X89576
C10j	matrix metalloproteinase 18 (MMP18); MMP19	Y08622; X92521
C10k	matrix metalloproteinase 2 (MMP2); 72-kDa gelatinase A; 72-kDa type IV collagenase precursor (CLG4A); H-ras-transformed	J03210; J05471
C10l	matrix metalloproteinase 3 (MMP3); stromelysin 1 precursor (STMY1; SL1); transin 1	X05232
C10m	matrix metalloproteinase 7 (MMP7)	X07819
C10n	matrix metalloproteinase 8 (MMP8)	J05556
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C11d	matrix metalloproteinase 9 (MMP9); gelatinase B; 92-kDa type IV collagenase precursor (CLG4B)	J05070; D10051
C11e	cathepsin L precursor; major excreted protein (MEP)	X12451
C11f	neutrophil gelatinase-associated lipocalin precursor (NGAL); 25-kDa alpha-2-microglobulin-related subunit of MMP9; lipocalin	X99133
C11g	beta NGF	X52599
C11h	platelet-derived growth factor A subunit precursor (PDGFA; PDGFF1)	X06374
C11i	platelet-derived growth factor B subunit precursor (PDGFB; PDGFF2); baclofermin; c-sis	X02811; X02744; M12783; M16288
C11j	platelet-derived growth factor receptor alpha precursor (PDGFR-alpha; PDGFRRA); CD140A antigen	M21574
C11k	platelet-derived growth factor receptor beta subunit (PDGFR-beta; PDGFRB); CD140B antigen	M21616
C11l	endothelial plasminogen activator inhibitor 1 precursor (PAI1; PLANH1)	X04429; M14083
C11m	placental plasminogen activator inhibitor 2 (PAI-2; PLANH2); monocyte ARG-serpin; urokinase inhibitor	M18082; J02685
C11n	protein C inhibitor (PROCI; PCI); plasma serine protease inhibitor precursor; plasminogen activator inhibitor 3 (PLANH3; PAI3)	M68516; J02639
C12a	BLANK	
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C12c	liver glyceraldehyde 3-phosphate dehydrogenase (GAPDH; G3PDH)	X01677
C12d	platelet-derived growth factor (PDGF) receptor beta-like tumor suppressor (PRLTS)	D37965
C12e	angiotensin 1 receptor precursor; tyrosine-protein kinase receptor TIE-2; tyrosine-protein kinase receptor TEK; p140 TEK; tL06139	J05593
C12f	tissue inhibitor of metalloproteinase 1 precursor (TIMP1); erythroid potentiating activity protein (EPA); fibroblast collagenase ii	X03124
C12g	tissue inhibitor of metalloproteinase 2 precursor (TIMP2)	J05593
C12h	tissue inhibitor of metalloproteinase 3 precursor (TIMP3)	U14394
C12i	tissue inhibitor of metalloproteinase 4 precursor (TIMP4)	U176456
C12j	tissue-type plasminogen activator precursor (T-PA)	M15518; X07393; M18182
C12k	vascular endothelial growth factor precursor (VEGF); vascular permeability factor (VPF)	M32977; M27281
C12l	vascular endothelial cell growth factor 165 receptor; VEGF156; neuroplinin	AF016050
C12m	vascular endothelial cell growth factor 165 receptor 2 (VEGF-2)	AF '98
C12n	vascular endothelial growth factor B precursor (VEGFB) + VEGFR-2 related factor 186 (VRF186)	U44444; U43369
C13a	BLANK	

C13b	BLANK	
C13c	BLANK	
C13d	BLANK	
C13e	BLANK	
C13f	BLANK	
C13g	BLANK	
C13h	BLANK	
C13i	BLANK	
C13j	BLANK	
C13k	BLANK	
C13l	BLANK	
C13m	BLANK	
C13n	BLANK	
C14a	liver glyceraldehyde 3-phosphate dehydrogenase (GAPDH; G3PDH)	X01677
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C14d	BLANK	
C14e	BLANK	
C14f	BLANK	
C14g	BLANK	
C14h	BLANK	
C14i	BLANK	
C14j	BLANK	
C14k	BLANK	
C14l	BLANK	
C14m	BLANK	
C14n	liver glyceraldehyde 3-phosphate dehydrogenase (GAPDH; G3PDH)	X01677
D01a	liver glyceraldehyde 3-phosphate dehydrogenase (GAPDH; G3PDH)	X01677
D01b	BLANK	
D01c	BLANK	
D01d	BLANK	
D01e	BLANK	
D01f	BLANK	
D01g	BLANK	
D01h	BLANK	
D01i	BLANK	
D01j	BLANK	
D01k	BLANK	
D01l	BLANK	
D01m	BLANK	
D01n	liver glyceraldehyde 3-phosphate dehydrogenase (GAPDH; G3PDH)	X01677
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D02b	BLANK	
D02c	BLANK	
D02d	BLANK	
D02e	BLANK	
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D02g	BLANK	
D02h	BLANK	
D02i	BLANK	
D02j	BLANK	
D02k	BLANK	
D02l	BLANK	
D02m	BLANK	
D02n	BLANK	
D03a	vascular endothelial growth factor C precursor (VEGFC); vascular endothelial growth factor related protein (VRP); FLT4 ligand U43142	
D03b	vascular endothelial growth factor receptor 1 (VEGFR1); fms-related tyrosine kinase 1 (FLT1); soluble VEGFR; soluble FLT (SIX51602; U01134	
D03c	vascular endothelial growth factor receptor 2 precursor (VEGFR2); kinase insert domain receptor (KDR); FLK1	L04947; X61656
D03d	vascular endothelial growth factor receptor 3 precursor (VEGFR3); FMS-related tyrosine kinase 4 (FLT4)	X68203; X69878; U43143
D03e	cadherin 6 precursor (CDH6); kidney cadherin (K-cadherin)	D31784
D03f	cadherin 11 precursor (CDH11); osteoblast-cadherin (OB-cadherin); OSF4	L34056
D03g	cadherin 12 (CDH12); brain cadherin precursor (BR-cadherin); neural cadherin 2 (N-cadherin 2)	L34057; L33477
D03h	cadherin 13 (CDH13); truncated cadherin precursor (T-cadherin); heart cadherin (H-cadherin)	L34058; U59289; U59288

D03j	cadherin 4 (CDH4); retinal cadherin precursor (R-cadherin; RCAD)	L34059
D03j	cadherin 8 (CDH8)	L34060
D03k	focal adhesion kinase (FADK); proline-rich tyrosine kinase 2 (PYK2)	L13618
D03l	focal adhesion kinase 2 (FADK2; FAK2); cell adhesion kinase beta (CAKbeta); proline-rich tyrosine kinase 2 (PYK2)	L49207 + U43522 + U33284
D03m	liver glyceraldehyde 3-phosphate dehydrogenase (GAPDH; G3PDPH)	X01677
D03n	BLANK	
D04a	interleukin 3 receptor beta subunit precursor (IL3R-beta; IL3RB); interleukin 5 receptor beta subunit precursor (IL5R-beta; IL5RB)	IL: M59941
D04a	cadherin1 (CDH1); epithelial cadherin precursor (E-cadherin; CDHE); uvomorulin (UVO); CAM 120/80	Z13009
D04c	cadherin 2 (CDH2); neural cadherin precursor (N-cadherin; NCAD)	M34064; X57548; X54315; S42303
D04d	urokinase-type plasminogen activator precursor (U-plasminogen activator; UPA)	M15476; D80244
D04e	integrin-linked kinase (ILK)	U40282
D04f	40S ribosomal protein SA (RPSA); 34/67-kDa laminin receptor; laminin receptor 1 (LAMR1); colon carcinoma laminin-binding factor	U43901
D04g	laminin alpha 4 subunit precursor (laminin A4; LAMA4)	X70904; X91171
D04h	collagen VIII alpha 1 subunit (COL8A1)	X57527
D04i	collagen VI alpha 3 subunit (COL6A3)	X52022
D04j	collagen XI alpha 2 subunit (COL11A2)	U32169
D04k	collagen XVI alpha 1 subunit precursor (COL16A1)	M92642
D04l	collagen XVIII alpha 1 subunit (COL18A1)	L22548
D04m	BLANK	
D04n	BLANK	
D05a	collagen IV alpha 6 subunit precursor (COL4A6)	D21337; U04845
D05b	collagen XI alpha 1 subunit precursor (COL11A1)	J04177
D05c	ezrin; cytovillin 2; villin 2 (VIL2)	X51521
D05d	protocadherin 43 precursor (PCDH43); cadherin-like protein	L11373
D05e	beta 3-endonexin	U37139
D05f	T-cell surface glycoprotein CD8 beta.1 subunit precursor	X13444
D05g	platelet glycoprotein IV (GPIV; PAS IV; PAS4); GPIIIB; CD36 antigen	M24795
D05h	integrin beta 3 (ITGB3); platelet membrane glycoprotein IIIa precursor (GP3A); CD81 antigen	J02703; M25108
D05i	wingless-related MMTV integration site 2 protein (WNT2); int-1-related protein (IRP)	X07876
D05j	wingless-related MMTV integration site 5a protein (WNT5A)	L20861
D05k	wingless-related MMTV integration site 8b protein (WNT8B)	X91940
D05l	N-sam; fibroblast growth factor receptor1 precursor (FGFR1); basic fibroblast growth factor receptor precursor (BFGFR); fms; X68945; M34641; M31186; M37722; M63887; M63888; M63889	
D05m	BLANK	
D05n	BLANK	
D06a	catenin alpha-like protein 1 (CTNNA1)	AF080071
D06a	female organ- & adipocyte-specific extracellular matrix protein 2 (ECM2)	AB011792
D06b	extracellular matrix protein 1 (ECM1)	U65932
D06c	coagulation factor VIII procoagulant component (F8C)	M14113
D06d	keratinocyte growth factor receptor (KGF); fibroblast growth factor receptor 2 (FGFR2); heparin-binding growth factor receptor	X57766
D06e	matrix metalloproteinase 11 (MMP11)	X13694
D06f	OSTEOPOINTIN PRECURSOR (BONE SIALOPROTEIN 1)	M30257
D06g	vascular cell adhesion protein 1 precursor (V-CAM1); CD106 antigen	X65778 + X51943 + M13361
D06i	acidic fibroblast growth factor (AFGF) + heparin-binding growth factor 1 precursor (HBGF-1) + beta-endothelial cell growth factor	M27968
D06j	basic fibroblast growth factor 2 (FGFB; FGF2)	X63629
D06k	cadherin 3 (CDH3); placental cadherin precursor (P-cadherin; CDHP)	X79981; X59796
D06l	cadherin 5 (CDH5); vascular endothelial cadherin precursor (VE-cadherin); 784 antigen; CD144 antigen	
D06m	BLANK	
D06n	BLANK	
D07a	urokinase-type plasminogen activator GPI-anchored form precursor (U-PAR; PLAU); monocyte activation antigen	M83246; X51675
D07b	growth factor receptor-bound protein 2 (GRB2); abundant SRC homology protein (ASH)	L29511; M96895
D07c	heparin-binding EGF-like growth factor (HBEGF; HEGFL); diphtheria toxin receptor (DTR)	M60278
D07d	insulin-like growth factor II (IGF2); somatomedin A	M29645
D07e	insulin-like growth factor binding protein 4 precursor (IGF-binding protein 4; IGFBP4; IBP4)	M62403
D07f	insulin-like growth factor binding protein 5 precursor (IGF-binding protein 5; IGFBP5; IBP5)	M65082
D07g	insulin-like growth factor binding protein 6 precursor (IGF-binding protein 6; IGFBP6; IBP6)	M62402
D07h	insulin-like growth factor binding protein 6 precursor (IGF-binding protein 6; IGFBP6; IBP6)	X70508
D07i	insulin-like growth factor binding protein 1 (IGFBP1); placental protein 12 (PP12)	M31145
D07j	insulin-like growth factor-binding protein 2 (IGF-binding protein 2; IGFBP2; IBP2)	M35410
D07k	insulin receptor precursor (INSR; IR)	M10051; X02160
D07l	insulin receptor-related protein precursor (IR-related receptor; IRR)	J05046
D07m	BLANK	
D07n	BLANK	
D08a	nerve growth factor receptor (NGF receptor; NGFR)	M14764

D08b	growth inhibitory factor (GIF); metallothionein-III (MT-III); MT3	D13365; M93311
D08c	hepatocyte growth factor-like protein (HGF activator-like protein)	D4 ; S83182
D08d	transforming growth factor beta 3 (TGF-beta3; TGFbeta3)	JO ;
D08e	fibroblast growth factor receptor 4 (FGFR4)	L03840
D08f	growth-arrest-specific protein 1 (GAS1)	L13698
D08g	fibroblast growth factor receptor 3 precursor (FGFR3); JTK4; fibroblast growth factor receptor 2 precursor (FLG2)	M58051; X58255
D08h	epidermal growth factor receptor kinase substrate EPS8	U12535
D08i	fibroblast growth factor 8 (FGF8); androgen-induced growth factor precursor (AIGF); HBGF8	U36223
D08j	PDGF-associated protein	U41745
D08k	p53-dependent cell growth regulator CCR19	U66469
D08l	transforming growth factor beta (TGF-beta; TGFB)	X02812; J05114
D08m	BLANK	
D08n	BLANK	
D09a	fibroblast growth factor 3 (FGF3); HBGF3; int2 proto-oncogene precursor	X14445
D09b	fibroblast growth factor 6 precursor (FGF6); HBGF6; HST2	X63454
D09c	TIS11B protein; butyrate response factor 1 (BRF1); EGF response factor 1 (ERF1)	X79067
D09d	insulin-like growth factor 1 receptor (IGF1R)	X04434; M24599
D09e	transforming growth factor beta receptor III precursor (TGF beta receptor III; TGFR3); betaglycan	L07594
D09f	insulin-like growth factor-binding protein 3 precursor (IGF-binding protein 3; IGFBP3; IBP3)	M31159; M35878
D09g	erbB3 proto-oncogene; HER3	M29366; M34309
D09h	insulin-like growth factor IA precursor (IGF1A); IGFBP1; somatomedin C + insulin-like growth factor 1 (IGF1)	M27544 + M37484
D09i	keratinocyte growth factor (KGF); fibroblast growth factor 7 (FGF7)	M60828
D09j	ephrin type-B receptor 2 precursor; tyrosine-protein kinase receptor EPH-3; DRT; HEK; ERK	L41939
D09k	erythropoietin receptor (EPOR)	M60459
D09l	platelet-activating factor receptor (PAFR)	M54995; M38441
D09m	BLANK	
D09n	BLANK	
D10a	interferon alpha/beta receptor alpha subunit precursor (IFN-alpha receptor; IFNAR)	J03171
D10b	interferon alpha/beta receptor beta subunit precursor (IFN-alpha-R); type 1 interferon receptor (IFN-R)	X77722
D10c	interferon gamma receptor (IFNGR)	A09781
D10d	interleukin 1 alpha precursor (IL1-alpha; IL1A); hematopoietin 1	X02851
D10e	interleukin 1 receptor-like protein 2 (IL1RL2)	U49065
D10f	interleukin 12 alpha subunit precursor (IL12-alpha; IL12A); cytotoxic lymphocyte maturation factor 35-kDa subunit (CLMF p35/M65291)	M29366; M34309
D10g	interleukin 12 beta subunit precursor (IL12-beta; IL12B); cytotoxic lymphocyte maturation factor 40-kDa subunit (CLMF p40); M65290	U03187
D10h	interleukin 12 receptor precursor (IL12R)	U14407
D10i	interleukin 15 (IL15)	U31628
D10j	interleukin 15 receptor alpha subunit precursor	U31628
D10k	interleukin 18 precursor (IL18); interferon gamma-inducing factor (IFN-gamma-inducing factor; IGF); interleukin 1 gamma (IL1-gamma)	U31628
D10l	interleukin 1 beta precursor (IL1-beta; IL1B); catabolin	K02770
D10m	BLANK	
D10n	BLANK	
D11a	interleukin 2 precursor (IL2); T-cell growth factor (TCGF)	A14844
D11b	interleukin 2 receptor alpha subunit precursor (IL2 receptor alpha subunit; IL2RA); TAC antigen; CD25 antigen	X01057; X01058; X01402
D11c	interleukin 2 receptor beta subunit precursor (IL2 receptor beta; IL2RB); p70-75; CD122 antigen	M26062
D11d	interleukin 2 receptor gamma subunit (IL2R-gamma; IL2RG); cytokine receptor common gamma chain precursor	D11086
D11e	interleukin 6 precursor (IL6); B-cell stimulatory factor 2 (BSF2); interferon beta 2 (IFNB2); hybridoma growth factor	X04602; M14584
D11f	interleukin 6 receptor alpha subunit precursor (IL6R-alpha; IL6RA); CD126 antigen	X12830
D11g	interleukin 6 receptor beta subunit precursor (IL6R-beta; IL6RB); membrane glycoprotein 130 (M57230)	X04602; M14584
D11h	interleukin 8 precursor (IL8); monocyte-derived neutrophil chemotactic factor (MDNCF); T-cell chemotactic factor; neutrophil Y00787	X17543; M30134
D11i	interleukin 9 precursor (IL9); T-cell growth factor p40	M84747
D11j	interleukin 9 receptor precursor (IL9R)	X01394
D11k	tumor necrosis factor alpha precursor (TNF-alpha; TNFA); cachectin	X01394
D11l	tumor necrosis factor receptor superfamily member 1B (TNFRSF1B); tumor necrosis factor receptor 2 precursor (TNFR2); tu	M32315; M55994
D11m	BLANK	
D11n	BLANK	
D12a	tumor necrosis factor receptor superfamily member 1A (TNFRSF1A); tumor necrosis factor receptor 1 (TNFR1); tumor necrosis	M33294
D12b	tumor necrosis factor type 1 receptor-associated protein (TRAP1)	U12595
D12c	interferon gamma receptor (IFN-gamma; IFNGR1); CDW119 antigen	J03143
D12d	gamma-interferon-inducible protein; IP-30	J03909
D12e	interleukin 13 precursor (IL13); NC30	L06801
D12f	interleukin 7 (IL7)	J04156
D12g	interleukin 14 precursor (IL14); high molecular weight B-cell growth factor (HMW-BCGF)	L15344
D12h	interleukin 4 precursor (IL4); B-cell stimulatory factor 1 (BSF-1); lymphocyte stimulatory factor 1	M13982

D12i	interleukin 3 precursor (IL3); multipotential colony-stimulating factor; hematopoietic growth factor; P-cell stimulating factor; π M14743; M17115	
D12j	interferon-inducible protein AIM2	AF024714
D12k	interferon beta (IFN-beta; IFNB); fibroblast interferon	M28622
D12l	interferon-induced guanylate-binding protein 1; guanine nucleotide-binding protein 1	M55542
D12m	BLANK	
D12n	BLANK	
D13a	interferon-induced guanylate-binding protein 2; guanine nucleotide-binding protein 2	M55543
D13b	interleukin 10 precursor (IL10); cytokine synthesis inhibitory factor (CSIF)	M57627
D13c	interleukin 11 (IL11); adipo genesis inhibitory factor (AGIF)	M57765
D13d	interleukin 1 receptor antagonist protein precursor (IL1RA; IRAP)	M63099
D13e	interleukin 16 (IL16); lymphocyte chemoattractant factor (LCF)	M90391
D13f	interferon gamma (IFN-gamma) receptor beta subunit precursor; IFN-gamma accessory factor 1 (AF1); IFN-gamma transducer	U05875
D13g	interleukin 17 precursor (IL17); cytotoxic T-lymphocyte-associated antigen 8 (CTLA8)	U32659
D13h	IL-17 receptor	U58917
D13i	interleukin 13 receptor	U70981
D13j	interferon gamma precursor (IFN-gamma; IFNG); immune interferon	X01992; M29383
D13k	interferon gamma-induced protein precursor (gamma-IP10)	X02530
D13l	interleukin 5 precursor (IL5); T-cell replacing factor (TRF); eosinophil differentiation factor; B-cell differentiation factor 1	X04688; J03478
D13m	BLANK	
D13n	BLANK	
D14a	interferon regulatory factor 1 (IRF1)	X14454
D14b	interferon alpha-induced 11.5-kDa protein	X67325
D14c	MHC class I molecule; MHC class I subunit-related protein A (MICA); PERB1.1	U65416; U69631; X92841
D14d	HLA class II histocompatibility antigen alpha chain precursor	K01171
D14e	heparan sulfate proteoglycan (HSPG2)	M85289
D14f	CC chemokine receptor type 4 (CMKBR4; CCR4)	X85740
D14g	GlcNAc-1-P transferase	Z82022
D14h	UDP-N-acetyl-alpha-D-galactosamine:polypeptide N-acetylgalactosaminyltransferase 2 (GALNACT2; GALNT2)	X85019
D14i	BCL2-associated X protein membrane (BAX)	L22474
D14j	B-cell leukemia/lymphoma protein 2 (BCL2)	M14745
D14k	fas soluble protein; apoptosis antigen 1 (APO1; APT1) [alternatively spliced]	Z70519
D14l	DNA-binding protein SMBP-2; glial factor-1 (GF-1)	L14754
D14m	BLANK	
D14n	liver glyceraldehyde 3-phosphate dehydrogenase (GAPDH; G3PDH)	X01677
E01a	BLANK	
E01b	BLANK	
E01c	BLANK	
E01d	BLANK	
E01e	BLANK	
E01f	BLANK	
E01g	BLANK	
E01h	BLANK	
E01i	BLANK	
E01j	BLANK	
E01k	BLANK	
E01l	BLANK	
E01m	BLANK	
E01n	liver glyceraldehyde 3-phosphate dehydrogenase (GAPDH; G3PDH)	X01677
E02a	caspase 2 precursor (CASP2); ICH1L cysteine protease; ICH1S	U13021; U13022
E02b	caspase 4 precursor (CASP4); CASP5; ICEH2 cysteine protease; ICH3; TX protease; TY protease; ICE(REL) III	U28014; U28015
E02c	caspase 8 precursor (CASP8); MCH5; ICE-LIKE apoptotic protease 5; MORT1-associated CED-3 homolog (MACH); FADD-hat; U60520; U58143; X98172; X98173; X98174; AF00962	
E02d	tumor necrosis factor superfamily member 6 (TNFSF6); fas antigen ligand (FASL); apoptosis antigen ligand (APTL; APT1LG1) D38122; U08137	
E02e	fas antigen; fasL receptor precursor; apoptosis antigen 1 (APO1; APT1); tumor necrosis factor receptor superfamily member 6 M67454	
E02f	TRAIL receptor 3; decoy receptor 1 (DCR1)	AF016267
E02g	tumor necrosis factor receptor 1-associated death domain protein (TNFR1-associated death domain protein; TRADD)	L41690
E02h	apoptosis-related protein TFAR15	AF022385
E02i	fas-activated serine/threonine kinase (FAST)	X86779
E02j	BCL2-interacting killer protein (BIK); NBK apoptotic inducer protein; BP4; BIP1	X89986; U34584
E02k	caspase & RIP adaptor with death domain (GRADD); RIP-associated protein with death domain (RAIDD)	U84388
E02l	BCL2 & p53 binding protein Bbp/53BP2 (BBP/53BP2)	U58334
E02m	BLANK	
E02n	BLANK	
E03a	BCL2 homologous antagonist/killer (BAK)	U23765; U16811; X64213

E03b BCL2-binding athanogene 1 (BAG1); glucocorticoid receptor-associated protein RAP46
E03c BCL2-associated death promoter (BAD); BCL2-binding component 6 (BBC6); BCL2L8
E03d BCL2-like 2 (BCL2L2); BCL-2; KIAA0271
E03e caspase 9 precursor (CASP9); MCH6; ICE-like apoptotic protease 6 (ICE-LAP6); apoptotic protease activating factor 3 (APAF U56390; U60521
E03f caspase 7 precursor (CASP7); MCH3; ICE-like apoptotic protease 3 (ICE-LAP3); CMH-1
E03g caspase 3 (CASP3); apopain precursor; cysteine protease CPP32; YAMA protein; SREBP cleavage activity 1 protein (SCA1) U37448
E03h cellular apoptosis susceptibility protein (CAS); chromosome segregation gene homolog U33286
E03i inhibitor of apoptosis protein 1 (IAP1); API1 + IAP homolog C; TNFR2-TRAF signaling complex protein 1; MIHC U45878 + U37546
E03j inhibitor of apoptosis protein 2 (IAP2); IAP homolog B; TNFR2-TRAF signaling complex protein 2; MIHC U45879; U37547
E03k inhibitor of apoptosis protein 3 (API3); IAP3; X-linked inhibitor of apoptosis protein (X-linked IAP); XIAP; IAP-like protein (HILP) U45880; U32974
E03l MAP kinase-activating death domain protein U77352
E03m BLANK
E03n BLANK
E04a TNF-alpha converting enzyme (TACE); a disintegrin & metalloproteinase domain 17 (ADAM17) U69611
E04b poly(ADP-ribose) polymerase (PARP; ADPRP; PPOL); NAD(+) ADP-ribosyltransferase; poly(ADP-ribose) synthetase M18112; J03473
E04c maleylacetoacetate isomerase (MAAI); glutathione transferase zeta 1 U86529
E04d TNF-related apoptosis inducing ligand (TRAIL); APO-2 ligand (APO2L) U57059
E04e caspase 6 precursor (CASP6); MCH2-alpha; MCH2-beta U20536; U20537
E04f ionizing radiation resistance-conferring protein + death-associated protein 3 (DAP3) U18321 + X83544
E04g excision repair cross-complementing rodent repair deficiency complementation group 1 (ERCC1) M13194
E04h xeroderma pigmentosum group D complementing protein (XPD); X-ray repair-complementing defective repair in Chinese hamster XZ2221
E04i xeroderma pigmentosum group B complementing protein (XPB); excision repair cross-complementing rodent repair deficiency M31899
E04j xeroderma pigmentosum group F complementing protein (XPF); excision repair cross-complementing rodent repair deficiency c L77890
E04k xeroderma pigmentosum group G complementing protein (XPG); X-ray repair-complementing defective repair in Chinese hamster L20046; X69978
E04l excision repair cross-complementing rodent repair deficiency complementation group 6 (ERCC6); Cockayne syndrome protein L04791
E04m BLANK
E04n BLANK
E05a growth arrest & DNA damage-inducible protein (GADD45); DNA damage-inducible transcript 1 (DDIT1) M60974
E05b growth arrest & DNA damage-inducible protein 45 beta (GADD45 beta) AF078077
E05c growth arrest & DNA damage-inducible protein 45 gamma (GADD45 gamma) AF078078
E05d DNAX protein homolog 2 (DNAJ2; hDJ2; HSJ2) D13388
E05e high mobility group protein isoforms 1 & Y (HMGY) M23619
E05f high mobility group protein HMG2 X62534
E05g poly(pyrimidine tract)-binding protein (PTB); heterogeneous nuclear ribonucleoprotein 1 (hnRNP 1); 57-kDa RNA-binding protein X65372
E05h heterogeneous nuclear ribonucleoprotein K (hnRNPk); dC-stretch-binding protein (CSBP); transformation-upregulated nucleolus protein S74678
E05i DNA topoisomerase 1 (TOPI) J03250
E05j DNA topoisomerase II alpha (TOP2A) M60974
E05k DNA topoisomerase II beta (TOP2B) X68060
E05l zinc-finger DNA-binding protein J04088
E05m BLANK D45132
E05n BLANK
E06a PRB-binding protein E2F1; retinoblastoma-binding protein 3 (RBBP3); retinoblastoma-associated protein 1 (RBAP1); PBR3 M96577
E06b E2F transcription factor 3 (E2F3); KIAA0075 Y10479
E06c nuclear factor NF-kappa-B p100 subunit; nuclear factor NF-kappa-B p52 subunit; H2TF1; oncogene lvt-10 X61498
E06d IkappaB epsilon (IKBE) U91616
E06e IkappaB kinase beta subunit (IKK beta) AF031416
E06f IkappaB kinase gamma subunit (IKK gamma) AF074382
E06g nucleoside diphosphate kinase B (NDPK) kinase B; NDKB); expressed in non-metastatic cells 2, protein (NME2); myc purine-binding protein L16785; M36981
E06h nuclear factor kappa-B DNA binding subunit (NF-kappaB) M58603
E06i reIA proto-oncogene; nuclear factor of kappa light polypeptide gene enhancer in B-cells 3 (NFKB3) L19067
E06j natural killer cell enhancing factor (NKEFB); thiol-specific antioxidant protein (TSA); thioredoxin peroxidase 1 (TDPX1); thioredoxin peroxidase 2 (TDPX2); thioredoxin-dependent peroxide reductase 2; proliferation-associated gene (PAG); natural killer X67951
E06k adenovirus E1A enhancer-binding protein; E1A-F; ets translocation variant 4 U18018
E06m BLANK
E06n BLANK
E07a RAD51C truncated protein AF029670
E07b DNA recombination & repair protein HNGS1 AF022778
E07c homeobox protein D3 (HOXD3); HOX4A D11117
E07d chromodomain-helicase-DNA-binding protein 1 (CHD1) AF006513
E07e recA-like protein HsRad51; DNA repair protein RAD51 homolog D13804
E07f xeroderma pigmentosum group C complementing protein (XPC) D21089
E07g DNA nucleotidyltransferase; terminal addition enzyme; terminal deoxynucleotidyltransferase (DNNT; TD) M11722; K01919
E07h 6-O-methylguanine-DNA methyltransferase (MGMT); methylated-DNA-protein-cysteine methyltransferase M29971

E07i	Ku (p70/p80) subunit; ATP-dependent DNA helicase II 86-kDa subunit; lupus ku autoantigen protein; thyroid-lupus autoantigen M30938	M36089
E07j	X-ray repair-complementing defective repair in Chinese hamster cells 1 (XRCC1)	M15796; J04718
E07k	proliferating cyclic nuclear antigen (PCNA); cyclin	U04045; L47583
E07l	DNA mismatch repair protein MSH2	
E07m	BLANK	
E07n	BLANK	
E08a	mutL protein homolog 1 (MLH1); colon cancer nonpolyposis type 2 protein (COCA2)	U07418
E08b	DNA mismatch repair protein PMS1 (PMS1 protein homolog 1)	U13695
E08c	DNA mismatch repair protein PMS2 (PMS1 protein homolog 2)	U13696
E08d	histone deacetylase 2 (HD2)	U31814
E08e	X-ray repair-complementing defective repair in Chinese hamster cells 4 (XRCC4)	U40622
E08f	DNA topoisomerase III alpha (TOP3A)	U43431
E08g	DNA mismatch repair protein MSH6; mutS alpha 160-kDa subunit; G/T mismatch binding protein (GTMBP; GTBP)	U54777
E08h	RAD50	U63139
E08i	BRCA1-associated ring domain protein 1 (BARD1)	U76638
E08j	BRCA1-associated ring domain protein	X82200
E08k	BRCA2 region clone CG018	U50527
E08l	DNA cytosine-5-methyltransferase (DNA metase; MCMT)	X63692
E08m	BLANK	
E08n	BLANK	
E09a	DNA-binding protein RFX5	X85786
E09b	DNA repair protein RAD54 homolog	X97795
E09c	zinc finger protein	Y14443
E09d	DNA fragmentation factor 45 (DFF45)	U91985
E09e	thymidylate synthase (TYMS; TS)	X02308
E09f	DNA polymerase alpha catalytic subunit (POLA)	X06745
E09g	X-ray repair-complementing defective repair in Chinese hamster cells 9 (XRCC9)	U70310
E09h	TRAF-interacting protein (I-TRAF) + TRAF family member-associated NF-kappaB activator; TANK	U59863 + U63830
E09i	early growth response protein 1 (EGR1); transcription factor ETR103; KROX24; zinc finger protein 225 (ZNF225); ATZ25	X52541; M62829
E09j	ubiquitin-conjugating enzyme E2 17-kDa (UBE2A); ubiquitin-protein ligase; ubiquitin carrier protein; HRGA	M74524
E09k	histone deacetylase 3C (HD3C)	AF005482
E09l	histone 4 (H4)	X67081
E09m	BLANK	
E09n	BLANK	
E10a	phosphatidic acid phosphatase 2B	AF017786
E10b	RNA helicase	X98743
E10c	AP-2 BETA TRANSCRIPTION FACTOR	X95694
E10d	CTP synthase; CTP synthetase; UTP-ammonia ligase	X52142
E10e	dihydrofolate reductase (DHFR)	V00507
E10f	DNA polymerase iota (POLI); RAD30B	AF140501
E10g	DNA polymerase lambda (POLL); POL-kappa	AJ131890
E10h	DNA (cytosine-5-)-methyltransferase 2 (DNMT2)	AJ223333
E10i	heterogeneous nuclear ribonucleoprotein L (HNRNPL)	X18135
E10j	phenylethanolamine N-methyltransferase (PNMTase); noradrenaline N-methyltransferase	J03727
E10k	UMP-CMP kinase	AF070416
E10l	activating transcription factor 3 (ATF3)	L19871
E10m	BLANK	
E10n	BLANK	
E11a	activating transcription factor 4 (ATF4); tax-responsive enhancer element B67 (TAXREB67); cAMP-response element-binding	D90209
E11b	H1 histone family member 0 (H1F0; H10); H1FV	X03473
E11c	ubiquitin-specific protease 5 (USP5); isopeptidase T (ISOT)	U35116
E11d	ubiquitin-conjugating enzyme E2N (UBE2N); UBC13	D83004
E11e	ubiquitin-conjugating enzyme E2D 3 (UBE2D3); UBCH5C	U39318
E11f	CAD; DNA fragmentation factor 40-kDa subunit (DFF40)	AF064019
E11g	Y box-binding protein 1 (YBX1; YB1); nuclease sensitive element binding protein 1 (NSEP1); DNA-binding protein B (DBPB)	X96666; U12982; U13007
E11h	cytidine deaminase (CDA)	L27943
E11i	deoxycytidylate deaminase (dCMP deaminase)	L39874
E11j	UV excision repair protein RAD23 homolog A (RAD23A; hHR23A)	D21235
E11k	DNA damage repair & recombination protein 52 (RAD52)	U12134
E11l	guanine nucleotide release/exchange factor (GNRP); ras-GRF; sos	L13857
E11m	BLANK	
E11n	BLANK	
E12a	telomerase reverse transcriptase (hTERT)	AF015950

E12b	cytosolic thymidine kinase (TK1)					K02641
E12c	thymidine phosphorylase precursor (TDRPase); platelet- derived endothelial cell growth factor (PDECGF); gliostatin					M13785
E12d	G/T mismatch-specific thymine DNA glycosylase (TDG)					U09443
E12e	cytochrome P450 reductase					S90469
E12f	S-mephenytoin 4-hydroxylase; cytochrome P450 IIC9 (CYP2C9); CYP2C10; CYP2C17; CYP2C18; CYP2C19					M21940; M15331; M21939; M61858; M61854
E12g	cytochrome P450 IA1 (CYP1A1); P450-P1; P450 form 6; P450-C					K03191
E12h	cytochrome P450 IA2 (CYP1A2); P450-P3; P450-4					Z00036
E12i	cytochrome P450 IID6 (CYP2D6)					M20403; M19697
E12j	cytochrome P450 IIE1 (CYP2E1)					J02625
E12k	cytochrome P450 IIIA3 (CYP3A3); CYP3A4; CYP3A5; CYP3A7					M13785; M18907; J04813; D00408
E12l	E2F dimerization partner 1; DRTF1-polypeptide 1 (DPT1)					L23959
E12m	BLANK					
E12n	BLANK					
E13a	NADP+ dihydroxyimidine dehydrogenase precursor (DPD); dihydroacetyl dehydrogenase; dihydrothymine dehydrogenase (DPY); U09178					J04093
E13b	microsomal UDP-glucuronosyltransferase 1-1 precursor (UDP1); UGT1A; GNT1; UGT1A; GNT1; UGT1A; GNT1; UGT1A; GNT1; UGT1A; GNT1					U00884; X63359; U06641; J05428; Y00317
E13c	microsomal UDP-glucuronosyltransferase 1-2 precursor (UDP2); UGT1.2; UGT1B; GNT1; UGT1.2; UGT1B; GNT1; UGT1.2; UGT1B; GNT1; UGT1.2; UGT1B; GNT1; UGT1.2; UGT1B; GNT1; UGT1.2; UGT1B; GNT1					L16991
E13d	microsomal UDP-glucuronosyltransferase 1-3 precursor (UDP3); UGT1.3; UGT1C; GNT1					M60527
E13e	microsomal UDP-glucuronosyltransferase 1-4 precursor (UDP4); UGT1.4; UGT1D; GNT1; bilirubin-specific isozyme 2 (hUG-E M57951)					Y00486
E13f	microsomal UDP-glucuronosyltransferase 1-6 precursor (UDP6); UGT1.6; UGT1F; GNT1					X02994; K02567
E13g	microsomal UDP-glucuronosyltransferase 2B15 precursor (UDP2B15); UDPGTH-3; UGT2B15 + microsomal 2B10 precursor (UDI U08854; X63359; U06641; J05428; Y00317)					L11005
E13h	thymidylate kinase					
E13i	deoxycytidine kinase					
E13j	adenine phosphoribosyltransferase (APRT)					
E13k	adenosine deaminase (ADA); adenosine aminohydrolase					
E13l	aldehyde oxidase (hAOX)					
E13m	BLANK					
E13n	BLANK					
E14a	BLANK					
E14b	BLANK					
E14c	BLANK					
E14d	BLANK					
E14e	BLANK					
E14f	BLANK					
E14g	BLANK					
E14h	BLANK					
E14i	BLANK					
E14j	BLANK					
E14k	BLANK					
E14l	BLANK					
E14m	BLANK					
E14n	liver glyceraldehyde 3-phosphate dehydrogenase (GAPDH); G3PDH					X01677
F01a	fatty acid synthase					S80437
F01b	nm23-H4; nucleoside-diphosphate kinase; nucleoside 5'-diphosphate phosphotransferase (NDK)					Y07604
F01c	uridine phosphorylase (UDRPase; UP)					X90858
F01d	xanthine dehydrogenase/oxidase					U39487
F01e	phosphoribosyl pyrophosphate synthetase 1 (PRPS1)					D00860
F01f	uridine diphosphoglucose pyrophosphorylase; UTP-glucose-1-phosphate uridylyltransferase					U27480
F01g	ornithine decarboxylase					X16277
F01h	ribonucleoside-diphosphate reductase M1 subunit; ribonucleotide reductase					X59543
F01i	uridine 5'-monophosphate synthase (UMP synthase)					J03626
F01j	5-methyltetrahydrofolate-homocysteine methyltransferase (MTR)					U71285
F01k	alkylglycerone phosphate synthase (AGPS); alkyl-dihydroxyacetonephosphate (ADHAP)					Y09443
F01l	cytochrome P450 IIC19 (CYP2C19)					M61854
F01m	BLANK					
F01n	liver glyceraldehyde 3-phosphate dehydrogenase (GAPDH); G3PDH					X01677
F02a	cytochrome P450 IIC8 (CYP2C8); mephenytoin 4-hydroxylase					Y00498
F02b	cytochrome P450 IIIA3 (CYP3A3); CYP3A4; nifedipine oxidase; CYP3A5; CYP3A7					M13785; M18907; J04813; D00408
F02c	cytochrome P450 IIIA3 (CYP3A3); CYP3A4; nifedipine oxidase					M18907
F02d	NADH-cytochrome B5 reductase					Y09501
F02e	microsomal UDP-glucuronosyltransferase 1-2 precursor (UDP1.2); UGT1.2; UGT1B; GNT1; HLUGP4					S55985
F02f	UDP-glucuronosyltransferase 1A7					U89507
F02g	UDP-glycosyltransferase 2 family polypeptide B (UGT2B)					AF030310
F02h	foliopolyglutamate synthase (FPGS)					M98045

F02i	DNA polymerase alpha 70-kDa subunit (POLA2)	L24559
F02j	DNA polymerase beta (POLB)	D29013
F02k	gamma-glutamyl hydrolase precursor (GGH; GH); folic polygamma glutamyl hydrolase; gamma-glu-X carboxypeptidase; conjugase	U55206
F02l	glutamate decarboxylase 65-kDa isoform; 65-kDa glutamic acid decarboxylase (GAD-65); GAD2	M81882
F02m	BLANK	
F02n	BLANK	
F03a	glutamate decarboxylase 67-kDa isoform; 67-kDa glutamic acid decarboxylase (GAD-67); GAD1	M81883
F03b	ribonucleoside-diphosphate reductase M2 subunit; ribonucleotide reductase	X59618
F03c	methylenetetrahydrofolate dehydrogenase- methylentetrahydrofolate cyclohydrolyase-formyltetrahydrofolate synthetase	J04031
F03d	adducin gamma subunit	U37122
F03e	elongation factor 1 alpha (EF1-alpha; EF1A)	M27364
F03f	elongation factor 2 (EEF2; EF2)	X51466
F03g	eukaryotic translation initiation factor 4E 25-kDa subunit (EIF4E); mRNA cap-binding protein	M15353
F03h	metalloprotease/disintegrin/cysteine-rich protein precursor (MDC9)	U41766
F03i	tissue inhibitor of metalloproteinases 3 (TIMP3); mitogen-inducible gene 5 (MIG5)	Z30183
F03j	ubiquitin-conjugating enzyme E2 32-kDa complementing protein; ubiquitin-protein ligase; ubiquitin carrier protein; CDC34	L22005
F03k	cytosolic superoxide dismutase 1 (SOD1)	K00065; X02317
F03l	endothelial nitric oxide synthase (EC-NOS)	M93718
F03m	BLANK	
F03n	BLANK	
F04a	glutathione peroxidase (GSHPX1; GPX1)	Y00483; M21304
F04b	glutathione synthetase (GSH synthetase; GSH-S); glutathione synthase	U34683
F04c	glutathione-S-transferase homolog	U90313
F04d	glutathione S-transferase pi (GSTP1); GST3	X08058; M24485
F04e	microsomal glutathione S-transferase II (microsomal GSTII)	U77604
F04f	microsomal glutathione S-transferase I (MGST1); GSTI2	J03746
F04g	glutathione S-transferase theta 2	L38503
F04h	27-kDa heat shock protein (HSP27); stress-responsive protein 27 (SRP27); estrogen-regulated 24-kDa protein; HSPB1	X54079
F04i	heat shock protein 40 homolog (HSP40 homolog); DNAJW	U40992
F04j	heat shock 70-kDa protein 6; heat shock 70-kDa protein B	X51757; M11236
F04k	heat shock 70-kDa protein 4 (HSPA4); HSP70RY; heat shock 70-related protein APG-2	L12723
F04l	heat shock cognate 71-kDa protein; heat shock 70-kDa protein 8 (HSPA8; HSC70); HSP73	Y00371
F04m	BLANK	
F04n	BLANK	
F05a	heat shock protein beta 2 (HSPB2); DMPK-binding protein; MKBP	S67070
F05b	90-kDa heat-shock protein A (HSP90A); HSP96; HSPCA	X07270
F05c	inducible nitric oxide synthase (iNOS); type II NOS; hepatocyte NOS (HEP-NOS)	L09210
F05d	cytoplasmic dynein light chain 1 (hDLC1; DLC1); protein inhibitor of neuronal nitric oxide synthase (PIN)	U32944
F05e	thioredoxin reductase	X91247
F05f	bleomycin hydrolase (BLM hydrolase)	X92106
F05g	glutathione S-transferase mu1 (GSTM1; GST1); HB subunit 4; GTH4	X68676; S01719
F05h	glutathione S-transferase M4 (GSTM4)	M96233
F05i	glutathione S-transferase theta 1 (GSTT1)	X79389
F05j	metallothionein 2A (MT2A)	V00594
F05k	thioredoxin (TRDX; TXN); ATL-derived factor (ADF); surface-associated sulphhydrylprotein (SASP)	J04026
F05l	glutathione reductase (GRase; GSR; GR)	X15722
F05m	BLANK	
F05n	BLANK	
F06a	major vault protein (MVP); lung resistance-related protein (LRP)	X79882
F06b	multidrug resistance-associated protein 1 (MRP1); ABCC1	L05628
F06c	canalicular multispecific organic anion transporter; multidrug resistance-associated protein 2 (MRP2); canalicular multidrug res	U63970
F06d	ATP-binding cassette subfamily B (MDR/TAP) member 1 (ABCB1); multiple drug resistance 1 protein (MDR1); P glycoprotein	M14758
F06e	multidrug resistance-associated protein 3 (MRP3); MLP2; ABCC3	Y17151
F06f	MRP/organic anion transporter (MOAT-B)	AF071202
F06g	ATP-binding cassette subfamily C member 3 (ABCC3); multidrug resistance-associated protein 5 (MRP5)	U83661
F06h	anthracycline resistance-associated protein (ARA)	X95715
F06i	ATP-binding cassette subfamily G (white) member 2 (ABCG2); breast cancer resistance protein (BCRP); mitoxantrone resista	AF098951
F06j	sulfonylurea receptor (SUR); ATP-binding cassette subfamily C (CFTR/MRP) member 8 (ABCC8)	L78207
F06k	mediator protein; SUR2	AF135022
F06l	ATP-binding cassette subfamily A member 3 (ABCA3)	U78735
F06m	BLANK	
F06n	BLANK	
F07a	cystic fibrosis transmembrane conductance regulator (CFTR); cAMP-dependent chloride channel	M28668

F07b	importin beta 1 subunit; karyopherin beta 1 subunit; importin 90; nuclear factor p87	L38051
F07c	importin alpha 3 subunit; karyopherin alpha 3 subunit	Y1
F07d	GTP-binding nuclear protein RAN (TC4)	M3...J9
F07e	fibroblast adenine nucleotide translocator 2 (ANT2)	J02683
F07f	type I cytoskeletal 14 keratin (KRT14); cytokeratin 14 (CK14)	J00124
F07g	cytokeratin 6A (CK6A); K6A keratin (KRT6A); CK6B; KRT6B; CK6C; KRT6C; CK6D; KRT6D; CK6E; KRT6E; CK6F; KRT6F	J00269; L42592; L42610; L42611; L42612
F07h	microtubule-associated protein 1B	L06237
F07i	microtubule-associated protein 4 (MAP4)	U19727
F07j	type I cytoskeletal 16 keratin (KRT16); cytokeratin 16 (CK16); pseudo-keratin K16 type 1	M21772; M20336
F07k	type I cytoskeletal 18 keratin (KRT18); cytokeratin 18 (CK18)	M26326
F07l	tubulin gamma subunit	M61764
F07m	BLANK	
F07n	BLANK	
F08a	type II cytoskeletal 11 keratin (KRT11); cytokeratin 11 (CK11); 67-kDa cytokeratin; hair alpha protein	M98776
F08b	type II cytoskeletal 2 epidermal keratin (KRT2E); cytokeratin 2E (CK2E)	M99061; S43646
F08c	type II cytoskeletal 2 oral keratin; cytokeratin 2P (CK2P)	M99063
F08d	cytoskeletal keratin 7 (KRT7); cytokeratin 7 (CK7)	X03212
F08e	type I cytoskeletal 9 keratin (KRT9); cytokeratin 9 (CK 9)	Z29074; S69510
F08f	vimentin (VIM)	X56134; M14144
F08g	desmin (DES)	U59167
F08h	liver glyceraldehyde 3-phosphate dehydrogenase (GAPDH; G3PDH)	X01677
F08i	BLANK	
F08j	BLANK	
F08k	BLANK	
F08l	BLANK	
F08m	BLANK	
F08n	BLANK	
F9a	chemokine receptor-like 2; IL8-related receptor DRY12; flow-induced endothelial G protein-coupled receptor (FEG1); G protein-coupled receptor GPI AF015257	Q99527; Q99H286
F9b	GAP-ASSOCIATED TYROSINE PHOSPHOPROTEIN P62	M88108
F9c	ribosomal protein S6 kinase II alpha 1 (S6KII-alpha 1); ribosomal S6 kinase 1 (RSK1)	Q07666 AH274
F9d	CREB-binding protein	Q15418 CA102
F9e	erbB3 proto-oncogene; HER3	Q92793 CAZ55
F9f	1D-myo-inositol-trisphosphate 3-kinase A; inositol 1,4,5-trisphosphate 3-kinase (IP3 3-kinase; IP3K)	P21860 7
F9g	1D-myo-inositol-trisphosphate 3-kinase B; inositol 1,4,5-trisphosphate 3-kinase (IP3 3-kinase; IP3K)	P23677 N278
F9h	90-kDa diacylglycerol kinase beta (DGKB; DAGK2); KIA00718	P27987 N282
F9i	diacylglycerol kinase alpha (DAGK1)	Q9UQ29 AH1199
F9j	non-catalytic region of tyrosine kinase adaptor protein 1 (NCK1)	O95217 AH1297
F9k	BLANK	P16333 H399
F9l	BLANK	
F9m	BLANK	
F9n	BLANK	
F9o	nck, ash, & phospholipase C gamma-binding protein (NAP4)	O14512 S1
F10a	phosphatase & tensin homolog (PTEN); mutated in multiple advanced cancers protein 1 (MMAKL1); TEP1	O00633; O02N253
F10b	akt1 proto-oncogene; rac alpha serine/threonine kinase (RAC-PK-alpha); protein kinase B (PKB)	P21749 C296
F10c	glycogen synthase kinase 3 alpha (GSK3-alpha)	P49840; O14C19
F10d	glycogen synthase kinase 3 beta (GSK3-beta); tau kinase subunit; factor A	P49841 CA116
F10e	Abl interactor 2 (Abi-2) + Abl binding protein 3 (ABI3P3) [ArgBP3]	Q13147 C300
F10f	src homology 2 protein (SH2)	src homology 659 - src homology 2 protein (SHB)
F10g	CRK-like protein	P46109 CA329
F10h	insulin receptor substrate 4	O14654 AH1217
F10i	insulin receptor substrate 1	P35568 H136
F10k	BLANK	
F10l	BLANK	
F10m	BLANK	
F10n	BLANK	
F11a	signal transducer and activator of transcription 1 alpha/beta (STAT1); transcription factor ISGF-3 components p91/p84	M97935
F11b	113-kDa signal transducer and activator of transcription 2 (STAT2; STAT113)	U18671; M97934
F11c	signal transducer and activator of transcription 4 (STAT4)	L78440
F11d	signal transducer & transcription activator 5A (STAT5A); STAT5B	U47686
F11e	BH3 INTERACTING DOMAIN DEATH AGONIST (BID)	AF042083
F11f	apoptosis regulator bcl-x	Z23115; L20121; L20122
F11g	fas-associated via death domain protein (FADD); mediator of receptor-induced toxicity protein 1 (MORT1)	U24231
F11h	DAXX	AF015956
F11i		
F11j		
F11k		
F11l		
F11m		
F11n		
F11o		
F11p		
F11q		
F11r		
F11s		
F11t		
F11u		
F11v		
F11w		
F11x		
F11y		
F11z		

ホルモン高感受性の閉経後乳癌に対する アナストロゾール投与による 術前内分泌療法の第Ⅱ相試験

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Appendix 1: 説明・同意文書、同意書

Appendix 2: CRF 一式

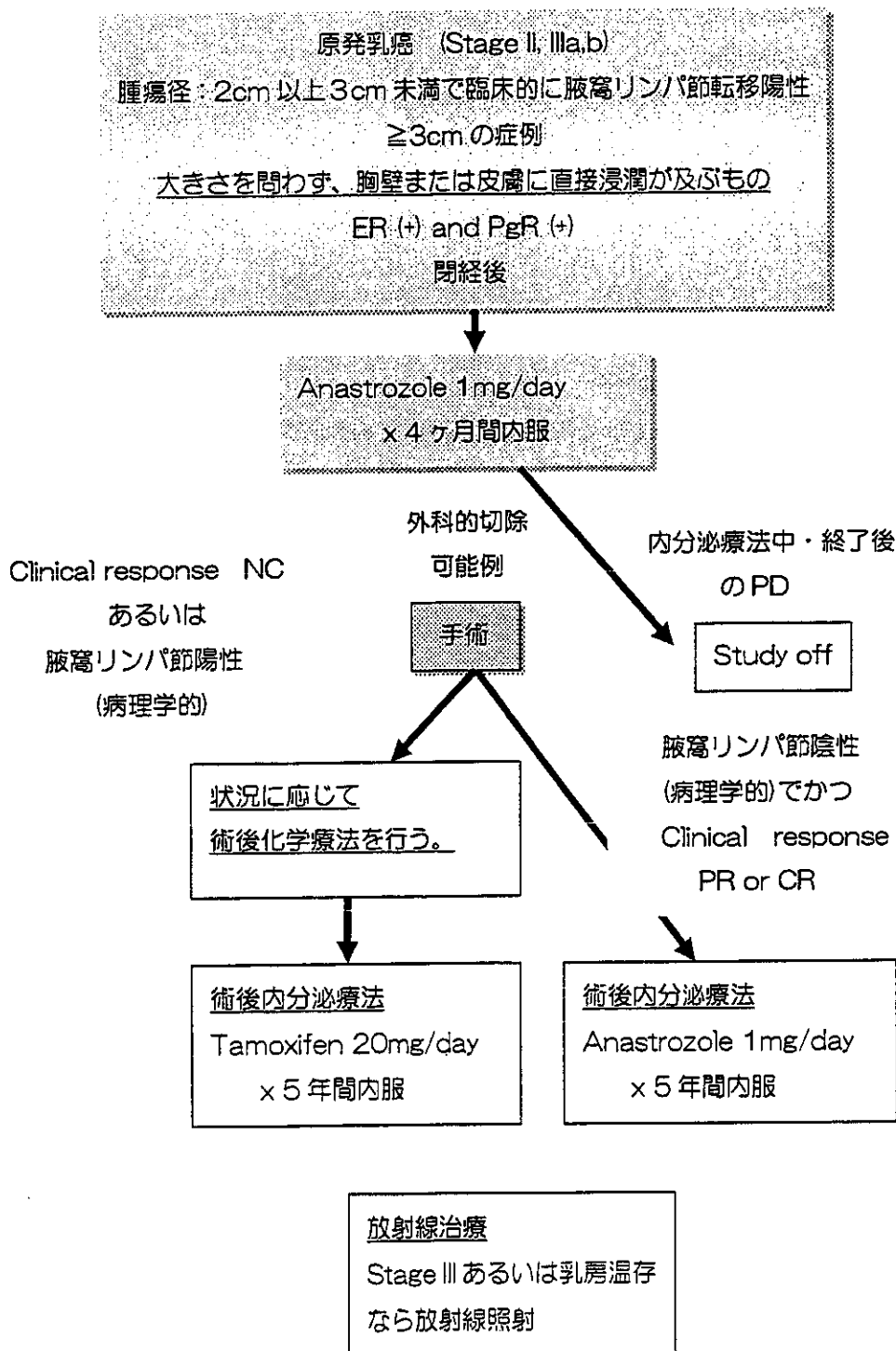
Appendix 3: 乳癌の組織学的分類(乳癌取り扱い規約第 14 版(2000 年))

Appendix 4: 乳癌の AJCC-TNM 分類 (2002)

Appendix 5: Anastrozole 添付文書

0. 概要

0-1 シェーマ



0-2 目的

閉経後の手術可能、ホルモン高感受性乳癌の術前内分泌療法において、Anastrozoleの臨床的腫瘍縮小効果を評価する。

1) 主評価指標 (プライマリーエンドポイント)

臨床的腫瘍縮小率

2) 副評価指標 (セカンダリーエンドポイント)

病理学的完全寛解率

乳房温存術施行率

有害事象発生率

0-3 対象症例

1) Disease characteristics

(a) 組織診 (core needle biopsy) で乳癌と診断された症例

(b) 臨床病期 (AJCC2002 年) II 期または IIIa,b 期で次のいずれかに該当する症例

- ・ 腫瘍径 2cm 以上 3cm 未満で臨床的に腋窩リンパ節転移陽性と判断できる症例
- ・ 腫瘍径 3cm 以上の症例
- ・ 大きさを問わず、胸壁または皮膚に直接浸潤が及ぶもの

(c) 原発巣のホルモン受容体は、以下に示す症例を適格とする。

- ・ ER および PgR が共に陽性 (IHC 法による)

2) Patient characteristics

(a) 年齢：閉経後の症例であれば年齢は問わない

(b) PS (ECOG) 0-2 の症例

(c) 以下の条件を満たす閉経後の女性症例。

- ① 50 歳以上の女性で、過去 12 ヶ月間に生理がない症例。
- ② FSH の値が施設における閉経後の範囲内の値である。

(d) 以下にあげる諸臓器機能を有する症例

・ 骨髄機能

白血球数 3,000/mm³ 以上

血小板 100,000/mm³ 以上

・ 肝機能

AST (GOT) および ALT (GPT) 100 IU/L 以下

総ビリルビン 1.5mg/dl 以下

・腎機能

血清クレアチニン 1.5mg/dl 以下

・心機能

心電図で正常又は治療を必要としない程度の変化

(e) 本人より文書による同意 (Informed Consent) が得られた症例

0-4 治療

Anastrozole 1mg/分1 4ヶ月間内服

0-5 予定症例数と研究期間

予定登録症例数：45 例

登録期間 2年、追跡期間：登録終了後 1年、総研究期間：3年

1. 目的

手術可能な、閉経後、ホルモン高感受性乳癌の術前内分泌療法において、Anastrozole の臨床的腫瘍縮小効果を評価する。

1) 主評価指標（プライマリーエンドポイント）

臨床的腫瘍縮小率

2) 副評価指標（セカンダリーエンドポイント）

病理学的完全寛解率

乳房温存術施行率

有害事象発生率

2. 背景

2-1 乳癌の術前薬物療法について

乳癌は、手術により肉眼的根治が可能であった症例でも、約 4 割の症例は術後再発を来すことから、発症の比較的早期から、臨床的に検出する事ができない「微小転移」が存在する「全身病」としてとらえられており¹⁾、この理論に基づいて手術後の再発予防を目的とした術後薬物療法の有用性が検討されてきた。そして、乳癌術後に化学療法を行うことによって生存率の向上が認められ²⁾、ホルモン受容体陽性乳癌においては、Tamoxifen による術後内分泌療法が閉経状況によらず有意に予後を改善することが知られている³⁾。

米国の NSABP (National Surgical Adjuvant Breast & Bowel Project) は手術可能な乳癌に対して、術前化学療法を行う群(747 例)と術後化学療法を行う群(759 例)の無作為化比較試験を行った⁴⁾。両治療群で無再発生存率、全生存率に統計学的な有意差は認められず、また乳房温存率は術前群の方が高かった(67% vs. 60%)。同様の比較試験が欧州でも行われており、従来の術後化学療法と比較して、無再発生存期間等の治療成績を損なうことなく、術前化学療法により乳房温存率の向上が示された。

これらの無作為化比較試験の結果は、全身治療を局所療法に先行させることは、再発率および生存率に影響を及ぼさないことを示している。そのうえで、術前に治療を行うことにより、原発巣の腫瘍縮小により患者個々の抗腫瘍効果を評価できること、乳房温存率の向上によりよい QOL を確保できる可能性が増すことから、術前薬物療法という概念そのものは標準的な治療法としてとらえ

られつつある。また術前薬物療法は、薬剤の感受性や耐性に関する in vivo での実験系としての有用性も注目すべきおり、薬物投与前後の腫瘍や血液の検体を採取し、translational research を行うことが将来の乳癌治療の個別化への布石としても重要である。

2-2 術前内分泌療法について

現時点では術前薬物療法としては化学療法が行われることが多いが、術前内分泌療法についても少数ながらいくつかの検討が行われている。局所進行乳癌に対する Tamoxifen 投与の第 II 相試験として、Mansi⁵⁾、Hoff⁶⁾らの報告があるが、奏効率はそれぞれ 41%、47%であった。これらの臨床試験においてはホルモン受容体の発現を全例について調べていなかった。また Mauriac⁷⁾らは閉経後 45%であった。

手術可能な乳癌での術前内分泌療法については、高齢者での報告がいくつかある。Gazet らは 70 歳以上の乳癌患者 200 例を手術または Tamoxifen に割付け、追跡期間中央値 5 年で無病期間に差を認めなかった⁸⁾。

また Mustacchi らは、70 歳以上の手術可能な乳癌に対して手術後 Tamoxifen 投与群対 Tamoxifen 投与単独群の無作為化比較試験を行った⁹⁾。追跡期間の中央値 36 ヶ月で、Tamoxifen 投与群において局所進行が多く認められたものの、遠隔転移は少なく、生存率には明らかな差を認めなかった。

乳癌のホルモン感受性を予測するホルモン受容体にはエストロゲンレセプター (ER) と、プロゲステロンレセプター (PgR) がある。Ravdin らは 398 名の ER 陽性転移性乳癌患者について、PgR の発現の程度別に、Tamoxifen の奏効率を前向きに検討した¹⁰⁾。PgR の測定値が 10 fmol/mg 未満、10-99 fmol/mg、100fmol/mg 以上の 3 群に分けて比較したところ、Tamoxifen の奏効率はそれぞれ 43%、53%、61%であり、ER、PgR 共に高発現している場合にホルモン療法への感受性がより高いことが示唆された。

また国立がんセンター中央病院 乳腺グループでは閉経後 ER、PgR 共に陽性の原発性乳癌患者に対する術前 Tamoxifen 療法の第 II 相試験を施行中である。最終的な解析は行われていないが、途中経過を清水らが 2001 年の乳癌学会総会に発表しているが、19 例中 13 例に臨床的腫瘍縮小効果を認めた¹¹⁾。

このように術前内分泌療法については、至適投与期間、病理学的評価、効果予測因子、レジメンなどに関して、十分なエビデンスが得られているとはいいがたい。しかし術後補助療法では個々の患者において確実な奏効が得られるかどうか不確実なまま薬物が投与され、術後内分泌療法の評価には長い年数がかかるため、新規内分泌療法剤の乳癌初期治療としての評価・開発には長期間を