

***Prognostic Significance of Chromosome 13q14
Deletion and Expression of CD19, CD28 and CD117
in Multiple Myeloma***

Thesis

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قَالَ

سَبِّحْكَ لَا إِلَهَ إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ
الْعَلِيمُ الْعَظِيمُ

صدقة الله العظيم

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To the great supporters in my life
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My Mother & My Grandmother

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LIST of ABBREVIATIONS

✓ α1-AT	α 1-antitrypsin
✓ β2M	β 2-microglobulin
✓ Ag	Antigen
✓ AL	Amyloid-light chain
✓ Alb	Albumin
✓ Ang-1	Angiopoietin 1
✓ APCs	Antigen presenting cells
✓ ARF	Alternate Reading Frame
✓ ASCT	Autologous stem-cell transplantation
✓ BAD	Bcl- 2-associated death promoter
✓ BAFF	B lymphocyte activating factor
✓ B-LPD	B-lymphoproliferative disorders
✓ Bcl-xL	B-cell lymphoma-extra large
✓ BCR	B cell receptor
✓ bFGF	Basic fibroblast growth factor
✓ BJP	Bence Jones protein
✓ BM	Bone marrow
✓ BMSCs	Bone marrow stromal cells
✓ BSAP	B-cell-specific activator protein
✓ Ca	Calcium
✓ CBC	Complete blood count
✓ CCND1	Cyclin D1 gene
✓ CCND3	Cyclin D3 gene
✓ CD	Cluster of differentiation
✓ CDK	Cyclin-dependent kinase
✓ CDKN2A	Cyclin-dependent kinase inhibitor 2A
✓ CGH	Comparative genomic hybridization
✓ cIAP-2	Cellular inhibitor of apoptosis protein 2
✓ cGy	centi-Gray
✓ CKS1B	Cyclin-dependent kinases regulatory subunit 1
✓ Cr	Creatinine
✓ CR2	Complement receptor type 2
✓ CRP	C-reactive protein

✓ CT	Computed tomography
✓ CTX	C-terminal crosslinking telopeptide of type I collagen
✓ Cy5	Cyanine 5
✓ DAPI	Diamidine phenyl indole dihydrochloride
✓ DCs	Dendritic cells
✓ Del	Deletion
✓ Dex	Dexamethasone
✓ DKK1	Dickkopf 1
✓ DNA	Deoxyribonucleic acid
✓ DW	Distilled water
✓ ECM	Extracellular matrix
✓ EDTA	Ethylenediaminetetraacetic acid
✓ EMN	European Myeloma Network
✓ EPICS	Experimental Physics and Industrial Control System
✓ ERK	Extracellular signal-regulated kinase
✓ ESR	Erythrocyte sedimentation rate
✓ ESRD	End-stage renal disease
✓ FADD	FAS-associated death domain protein
✓ FBS	Fetal bovine serum
✓ FGF	Fibroblast growth factor
✓ FGFR	Fibroblast growth factor receptor
✓ FISH	Fluorescence in situ hybridization
✓ FITC	Fluorescein isothiocyanate
✓ FKHR	Forkhead transcription factor
✓ FLC	Free light chain
✓ FLICE	FADD (Fas associated death domain)-like interleukin-1 β -converting enzyme
✓ FLIP	FLICE-inhibitory protein
✓ FS	Forward scatter
✓ GIST	Gastrointestinal stromal tumors
✓ GM-CSF	Granulocyte macrophage colony stimulating factor
✓ Grb-2	Growth factor receptor-bound protein-2
✓ Hb	Hemoglobin

✓ HBSS	Hank's balanced salt solution
✓ HGF	Hepatocyte growth factor
✓ HMCL	Human myeloma cell line
✓ HS	Highly significant
✓ IAPs	Inhibitors of apoptosis
✓ ICAM-1	Intracellular adhesion molecule-1
✓ ICTP	Carboxy-terminal telopeptide of type-1 collagen
✓ I-FISH	Interphase fluorescent in situ hybridization
✓ IFN-γ	Interferon gamma
✓ Ig	Immunoglobulin
✓ IGF-1	Insulin-like growth factor-1
✓ IgH	Immunoglobulin heavy-chain
✓ IgL	Immunoglobulin light-chain
✓ IL	Interleukin
✓ IMWG	The International Myeloma Working Group
✓ IPT	Immunophenotyping
✓ IRF4	Interferon regulatory factor 4
✓ ISS	International staging system
✓ IV	Intravenous
✓ JAK	Janus kinase
✓ JNK	Jun-N-terminal kinase
✓ LCD	Light chain disease
✓ LCDD	Light chain deposition disease
✓ LDH	Lactate dehydrogenase
✓ LFA-1	Leukocyte function-associated antigen-1
✓ LSI	Locus specific identifier
✓ M protein	Monoclonal protein
✓ MAFB	v-maf musculoaponeurotic fibrosarcoma oncogene, protein B (avian)
✓ MAPK	Mitogen-activated protein kinase
✓ max CD	Maximum cytoplasmatic diameter
✓ max ND	Maximum nuclear diameter
✓ Mcl-1	Myeloid cell leukemia 1
✓ M-CSF	macrophage colony stimulating factor
✓ MGUS	Monoclonal gammopathy of undetermined

	significance
✓ MEK	Mitogen activated protein extracellular regulated kinase kinase (MAP ERK kinase)
✓ MHC	Major histocompatibility complex
✓ MIP-1α	Macrophage inflammatory protein -1 alpha
✓ MM	Multiple myeloma
✓ MMP	Matrix metalloproteinase
✓ MMSET	Multiple myeloma SET domain
✓ MP	Melphalan and prednisone
✓ MPC-1	Monocyte chemoattractant protein-1
✓ MRI	Magnetic resonance imaging
✓ mRNA	messenger RNA
✓ mSMART	Mayo Stratification of Macroglobulinemia and Risk-Adapted Therapy
✓ MVD	Microvessel density
✓ MYC	Myelocytomatosis gene
✓ NF-κB	Nuclear factor kappa-light-chain-enhancer of activated B cells
✓ NK	Natural killer
✓ NS	Non significant
✓ NTX	N-terminal telopeptide of collagen type I
✓ OAF	Osteoclast activating function
✓ OPG	Osteoprotegerin
✓ OS	Overall survival
✓ p	Short arm of chromosome
✓ PAMP	Pathogen-associated molecular patterns
✓ Pax	Paired box containing genes
✓ PB	Peripheral blood
✓ PBS	Phosphate buffered saline
✓ PC	Plasma cell
✓ PC5	R-Phycoerythrin covalently linked to Cy5
✓ PCD	Plasma cell disorders
✓ PCL	Plasma cell leukemia
✓ PCLI	Plasma cell labeling index
✓ PDK1	3-phosphoinositide dependent kinase-1

✓ PE	R-Phycoerythrin
✓ PET	Positron emission tomography
✓ PFS	Progression free survival
✓ PI3-K	Phosphatidylinositol 3-kinase
✓ PKB	Protein kinase B
✓ Plt	Platelet
✓ PTEN	Phosphatase and tensin homolog
✓ PTHrP	Parathyroid hormone related peptide
✓ PTKs	Protein-tyrosine kinases
✓ q	Long arm of chromosome
✓ RANKL	Receptor activator of nuclear factor kappa-B ligand
✓ RAS	Rat sarcoma
✓ Rb	Retinoblastoma
✓ RETI	Related end organ or tissue impairment
✓ RNA	Ribonucleic acid
✓ RPMI	Roswell Park Memorial Institute medium
✓ S	Significant
✓ SCF	Stem cell factor
✓ SCT	Stem cell transplantation
✓ SD	Standard deviation
✓ SDF-1α	Stromal-cell-derived factor-1 alpha
✓ SET	Suppressor of variegation [Sur(var)3-9], Enhancer of zeste [E(z)], and Trithorax (in drosophila)
✓ SIBLING	Small integrin-binding ligand N-linked glycoproteins
✓ SMM	Smoldering myeloma
✓ SNP	Single nucleotide polymorphism
✓ sos	son of sevenless
✓ SPEP	Serum protein electrophoresis
✓ SPSS	Statistical package for Social Science
✓ SS	Side scatter
✓ SSC	Standard saline citrate
✓ STAT	Signal transducer and activator of transcription
✓ SWOG	South west Oncology Group

✓ t	Translocation
✓ T. Ptn	Total protein
✓ TAPA-1	Target of the antiproliferative antibody 1
✓ TCR	T cell receptor
✓ TGF-β	Trasnforming growth factor beta
✓ TIMP	Tissue inhibitors of metalloproteinase
✓ TLC	Total leucocytic count
✓ TLRs	Toll-like receptors
✓ TNF-α	Tumor necrosis factor- α
✓ TP53	Tumor protein p53
✓ TRACP-5b	Tartarate resistant acid phosphatase -5b
✓ UPEP	Urine protein electrophoresis
✓ VAD	Vincristine, Adriamycin, Dexamethasone
✓ VCAM-1	Vascular cell adhesion molecule-1
✓ VDJ	Variable diversity joining rearrangement
✓ VEGF	Vascular endothelial growth factor
✓ VLA-4	Very Late Antigen-4
✓ Vs	Versus
✓ WBCs	White blood cells
✓ WHO	World Health Organization
✓ WM	Waldenström macroglobulinemia
✓ Wnt	Wingless-Int signaling pathway
✓ WWOX	WW domain containing oxidoreductase
✓ XIAP	X-linked inhibitor of apoptosis protein

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