

Study of Podocalyxin as an Identifying Marker of Leukemic Blast Cells in Acute Myeloid Leukemia

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SUMMARY

AML describes a heterogenous group of hematological disorders characterized by block in the terminal differentiation of particular hemopoietic cell lineage. The accurate diagnosis of AML is important for appropriate treatment and management. Flow cytometric immunophenotyping (FCI) has a well-established role as a diagnostic modality in acute leukemias, particularly as a tool for assigning lineage & facilitating further pathologic classifications.

Diagnostically, detection of CD34 has a central role in the immunophenotypic identification of abnormal blast populations in bone marrow, peripheral blood and tissues by flow cytometric and immunohistochemical analysis. However, not all leukemic blasts express CD34.

The aim of this work was to study the expression of podocalyxin in leukemic myeloblasts and whether its detection can increase the ability to immunophenotypically identify leukemic blasts compared with detection of CD34 alone. We also aimed to study the prognostic relevance of Podocalyxin expression in acute myeloid leukemia patients.

This study was carried out on 30 adult patients newly diagnosed with acute myeloid leukemia. They were 18 males

list of Abbreviations

ABL1:	Abelson murine leukemia viral oncogene homolog 1
Akt:	AKT8 virus oncogene cellular homolog
AKT:	Protein kinase B
AML:	Acute myeloid leukemia
APC:	Adenomatous polyposis coli
APL:	Acute promyelocytic leukemia
ARF:	Alternate reading frame of the INK4a/ARF locus
BAD:	Bcl-2-associated death promoter
Bax:	Bcl-2-associated X protein
Bcl2:	B cell lymphoma 2
BCR:	Breakpoint cluster region
Bim:	Pro-apoptotic protein belonging to the BH3-only group of family members
BM:	Bone marrow
CBFA:	Core binding factor alpha
CBFβ:	Core binding factor beta
Cd34$^{-/-}$:	CD34 negative cells
cdc42:	Small GTPase of Rho family
CDK2:	Cyclin dependent kinase 2
CDK4:	Cyclin dependent kinase 4
cDNA:	Complementary DNA
CEBPA:	CCAAT/enhancer-binding protein alpha
CEBPα:	CCAAT/enhancer-binding protein alpha

C-FMS:	Human cellular homologue of the retroviral oncogene v-fms- formerly McDonough feline sarcoma viral oncogene
C-KIT:	Proto-oncogene tyrosine-protein kinase
CGH :	Comparative genomic hybridization
CR:	Complete remission
CREB:	CAMP response element-binding protein
CRKL:	The adapter protein Crk like
CyclD:	Cyclin D protein
CyclE:	Cyclin E protein
DW:	Distilled water
E2F:	Transcription factor family including E2F- and DP-like subunits
EGFR:	Epidermal growth factor receptor
Erk:	Extracellular signal-regulated kinase
ER:	Status -a score of estrogen receptor
ETO:	Eight twenty-one
EVII:	Ectopic viral integration site 1
FADD:	Fas-associated protein with death domain
FAK:	Focal adhesion kinase
Fas:	TNF superfamily receptor 6
FCM:	Flowcytometry
FcR:	Fc receptor
FISH:	Fluorescence in situ hybridization (FISH)
FLT3:	Fms-like tyrosine kinase3
Fos:	V-fos FBJ murine osteosarcoma viral oncogene homolog
Fyn:	A Src family tyrosine-protein kinase

GCTM2:	Germ cell tumor marker2
Gli:	Gli family transcription factors
gp135:	Glycoprotein 135
GPCR:	G protein coupled receptor
GRB:	Growth factor receptor-bound protein
GSK:	Glycogen synthase kinase
HSCs:	Human stem celles
IGF1:	Insulin-like growth factor 1
Jak:	Janus-family tyrosine kinase
JAK2:	Janus activated kinase
Jun:	Is the name of a gene and protein that in combination with c-Fos forms the AP-1 early response transcription factor
Mad:	Max dimerization protein 1
MAPK:	Mitogen-activated protein kinase
MCF7 breast cancer:	Michigan Cancer Foundation - 7 breast cancer cell line
MDCK cells:	Madin-Darby Canine Kidney Cells
Mdm2:	Murine double minute 2, a p53-associated oncogene
MDS:	Myelodysplastic syndrome
MEK:	MAPK/Erk kinase
MEKK:	MAPK/Erk kinase kinase
MKL1:	Myocardin like protein 1
MLL:	Mixed lineage leukemia
MLLT3:	Mixed lineage leukemia translocated to 3
MMP1:	Matrix metalloprotease1
MMP9:	Matrix metalloprotease 9
MPO:	Myeloperoxidase

Mt:	Mitochondria
MTG8:	Myeloid translocation gene on chromosome 8
Myc:	Myelocytomatosis oncogene cellular homolog
MYH11:	Myosin heavy chain 11
NEC:	Non-erythroid cells
NF1:	Nuclear factor-1
NF-κB:	Nuclear factor κ B
NHERF1:	Na (+)/H (+) exchanger regulating factor 1
NMP1:	Nuclear matrix protein 1
NPM:	Nucleophosmin
NSGCT:	Nonseminomatous germ cell tumors
P15:	Protein of 15 kilodalton,
P16:	Protein of 16 kilodalton,
P21:	Protein of 21 kilodalton,
p27:	Protein of 27 kilodalton,
P53:	Protein of 53 kilodalton,
PB:	Peripheral blood
PC3:	One of the prostate cancer cell line
PCLP1:	Podocalyxin like protein 1
PCR:	Polymerase chain reaction
PDAC:	Pancreatic ductal adenocarcinomas
PDGFRA:	Platelet derived growth factor alpha receptor
PDGFRB:	Platelet derived growth factor beta receptor
PI3K:	Phosphoinositide 3 kinase
PKA:	Protein kinase A
PKC:	Protein kinase C

PLC:	Phospholipase C
PLZF:	Promyelocytic leukemic zinc finger gene,
PML:	Promyelocytic leukemia
PODXL:	Podocalyxin
Podxl-/-:	Podocalyxin negative cells
PTEN:	Phosphatase and tensin homolog deleted on chromosome 10
Pu.1:	Spleen focus forming virus (SFFV) proviral integration oncogene spi1
Raf:	Proto-oncogene serine/threonine-protein kinase
RARA:	Retinoic acid receptor alpha
RARα:	Retinoic acid receptor alpha
RAS:	Rat sarcoma
Rb:	Retinoblastoma protein
RBM15:	RNA binding motif protein 15
RT –PCR:	Reverse transcriptase polymerase chain reaction
RTK:	Receptor tyrosine kinase
RUNX1:	Runt-related transcriptional factor 1
RUNX1T1:	Runt-related transcription factor 1translocated to 1 (cyclin D-related)
SBB:	Sudan Black B
Shc:	SH2-containing collagen-related proteins
SMO:	Smoothened a G-coupled transmembrane protein
SOS:	Son of sevenless guanine nucleotide exchange factor
Src:	Rous sarcoma oncogene cellular homolog
SSC:	Side scatter

Stat:	Signal transducer and activator of transcription, B-cell lymphoma-extra-large
TCF:	T cell factor
TNF:	Tumor necrosis factor
TNF:	Tumor necrosis factor
Tra-1-60:	Tumor rejection antigen 1-60
Tra-1-81:	Tumor rejection antigen 1-80
Wnt:	Was coined as a catenation of Wg (wingless) and Int and is pronounced 'wint'

List of Figures

Figure No.	Title	Page No.
Figure (1):	Overview of signal transduction pathways.....	8
Figure (2):	Mutated FLT3 signals via activation of multiple downstream pathways	10
Figure (3):	Schematic presentation of some intracellular signaling pathways with relevance for the pathogenesis of AML.....	12
Figure (4):	A: A patient with typical plum-colored lesions seen in leukemia cutis. This patient had acute myelogenous leukemia. B: Red-brown papules can be seen in leukemia cutis. They are confluent in this patient .C: Involvement of the face in a patient with acute myelogenous leukemia D: Diffusely swollen gums due to infiltration by leukemic cells in a person with acute myelomonocytic leukemia.....	19
Figures (from 5a to 5g):	Morphology of blast cell in different AML subtypes.....	20
Figure (6):	A: positive Myeloperoxidase. B: Positive nonspecific esterase.....	23
Figure (7):	Karyotypic analysis in a patient with acute myeloid leukaemia associated with t (8; 21).....	29
Figure (8):	Metaphase of a patient with acute myeloid leukemia and a complex aberrant karyotype after 24 – colour fluorescence in situ hybridization.....	30
Figure (9):	principle of transcriptional profiling of RNA expression in leukemia samples using DNA microarrays.....	33

Figure (10): Acute myeloid leukemia flowchart illustrating typical treatment regimen.....	36
(Figure 11): Schematic of protein structures. CD34, podocalyxin and endoglycan	44
(Figure 12): Genomic organizations of CD34, podocalyxin and endoglycan.....	46
(Figure 13): (A) L-selectin expressed on naive lymphocytes recognizes HEV-specific glycosylation motifs on CD34-family members and mediates cell adhesion. (B) The bulky, negatively charged extracellular domains of CD34 family members block cell adhesion by charge repulsion and steric hindrance; this prevents interaction of integrins with their ligands.....	50
(Figure 14): Levels of podocalyxin expression might explain its apparently contradictory roles in cell adhesion. (A) Membrane-protein-segregation model. Low levels of podocalyxin establish apical domains and force integrins to the basal surface of cells, thereby enhancing cell adhesion. (B) High levels of podocalyxin strongly induce microvillus formation. Dramatic relocalization of actin to the apical membrane to support formation of microvilli might deplete basolateral actin, thereby disrupting integrin mediated adhesion.....	53
(Figure 15): (A) Model of podocalyxin-dependent chemotaxis. (B) Two proposed mechanisms by which podocalyxin might facilitate asymmetric cell division. Segregation of podocalyxin to the apical surface might enable the interaction of adhesion molecules with the stem-cell niche; after division, only the cell that remains in contact with the niche would receive signals to maintain pluripotency. Alternatively, podocalyxin- and NHERF1-dependent segregation of cell-fate determinants might instruct the cell to divide asymmetrically.....	60
(Figure 16): Immunohistochemical analysis of podocalyxin protein expression in breast tumor specimens.....	62

(Figure 17): ROC curve for diagnostic utility of the percent of podocalyxin positive CD45 gated blast cells.....	90
(Figure 18): ROC curve for diagnostic utility of the percent of podocalyxin positivity out all BM cells.....	91
(Figure 19): ROC curve for predicting response to therapy using the % of podocalyxin positive CD45 gated blast cells.....	92
Figure (20): Comparison between podocalyxin & CD34 expression (out of all BM cells) as regards diagnostic utility in AML.....	93
Figure (21): Comparison between podocalyxin & CD34 expression (out of CD45 gated blast cells) as regards diagnostic utility in AML	93
Figure (22): Regression analysis showing negative correlation between CD34 expression by CD45 gated blast cells and % of BM blast cells among patients.....	94
Figure (23): Regression analysis showing negative correlation between Podocalyxin expression out of all BM cells and CD33 expression among patients.....	94
Figure (24): Regression analysis showing positive correlation between percent & intensity of podocalyxin expression on CD45 gated blast cells among patients.....	95
Figure (25): Regression analysis showing positive correlation between percent of CD34 expression & coexpression of CD34 with podocalyxin on CD45 gated blast cells among patients.....	95
Figure (26): Regression analysis showing positive correlation between Intensity of CD34 expression and coexpression of CD34 with podocalyxin on CD45 gated blast cells among patients.....	96
Figure (27): Regression analysis showing positive correlation between percent of podocalyxin expression on CD45 gated blast cells &	

coexpression of CD34 with podocalyxin on CD45 gated blast cells among patients.....	96
---	----

Figure (28): Regression analysis showing positive correlation between intensity of CD34 expression & percent of podocalyxin expression on CD45 gated blast cells among patients.....	97
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Figure (29): Regression analysis showing insignificant correlation between CD34 expression and Podocalyxin expression on CD45 gated blast cells among patients.....	97
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List of Tables

Table No.	Title	Page No.
Table (1):	Conditions predisposing to development of AM.....	6
Table (2):	The molecular lesions in AML associated with malignant characteristics.....	7
Table (3):	The French-American-British classification of acute myeloid leukemia.....	14
Table (4):	The World Health Organization classification of AML (2008).....	15
Table (5):	Clinical picture of acute myeloid leukemia.....	16
Table (6):	Cytochemical stains used for diagnosis of AML.....	22
Table (7):	Immunologic Phenotypes of AML.....	24
Table (8):	Score for biphenotypic acute leukemia.....	25
Table (9):	Clinical Correlation of Frequent Cytogenetic Abnormalities Observed in AML.....	27
Table (10):	Prognostic factors in acute myeloid leukemia.....	34
Table (11):	Drugs used in the treatment of leukaemia.....	38
Table (12):	Tissue and cell-type distribution of CD34-family Proteins.....	47
Table (13):	Descriptive data of control subjec.....	81
Table (14):	Descriptive data of AML patients.....	82

Table (15): Comparison between patients & controls as regards expression of podocalyxin & CD34 by BM blast cells.....	83
Table (16): Comparisons between FAB subtypes.....	84
Table (17): Comparisons between cytogenetics subgroups...	84
Table (18): Comparisons between patients' subgroups according to Response to therapy.....	85
Table (19): Comparison between Podocalyxin positive & negative cases (Percent on blast cells) with respect to clinical subgroups.....	86
Table (20): Comparison between Podocalyxin positive & negative cases (percent on blast cells) as regards quantitative data.....	87
Table (21): Comparison between Podocalyxin positive & negative cases (percent of podocalyxin positivity out of all BM cells) as regards quantitative data.....	88
Table (22): Comparison between Podocalyxin positive & negative cases (percent of podocalyxin positivity out of all BM cells) with respect to clinical subgroups.....	89
Table (23): Comparison between podocalyxin & CD34 expression as regards diagnostic utility in AML.....	90