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

Thesis

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رسالة

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في الباثولوجيا الاكلينيه والكميائية

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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**
EVI1:	**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-kB:	**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 killodalton,**
P16:	**Protein of 16 killodalton,**
P21:	**Protein of 21 killodalton,**
p27:	**Protein of 27 killodalton,**
P53:	**Protein of 53 killodalton,**
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**
RAR*α*:	**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'**

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