



# **Evaluation of galectins gene expression in acute myeloid leukemia patients**

A Thesis Submitted in Partial Fulfillment of the Requirements for the Award of the Degree of

**Master of Science**

By

**Mahmoud Moustafa Abd-elfatah**

B.Sc. (Zoology/chemistry 2013)

Under Supervision of

**Prof. Dr. Nagwa Hassan Ali Hassan**

Professor of cytogenetics

Department of Zoology,

Faculty of Science, Ain Shams University

**Prof. Dr. Magda Mahmoud Assem**

Professor of clinical pathology

National Cancer Institute, Cairo University

**Dr. Reham Hassaan Gomaa Helwa**

Assistant Professor of molecular cancer biology

Department of Zoology,

Faculty of Science, Ain Shams University

Zoology Department  
Faculty of science  
Ain shams University  
2020

## **ACKNOWLEDGMENT**

First and foremost, praises and thanks to the God, by whose grace this work had been completed.

I would like to express my deep and sincere appreciation to prof. Dr. Nagwa Hassan Ali, Professor of cytogenetics, Department of Zoology, Faculty of Science, Ain Shams University, for her professional guidance, encouragement and careful monitoring through different stages of this research. I am extremely grateful for everything she has taught me.

I would also like to thank Prof. Dr. Magda Mahmoud Assem, Professor of clinical pathology, National Cancer Institute, Cairo University, for giving me the opportunity to do research. Her energy, vision and constant motivation have also inspired me.

I am extremely grateful for Dr. Reham Hassan Helwa, Assistant Professor of molecular cancer biology, Department of Zoology, Faculty of Science, Ain Shams University. It was a great pleasure and honor to work and study under her guidance. She has taught me the methodology and statistics to perform the research and to present the research works as clearly as possible. You have done so much that I can't find words to express my gratitude.

I appreciate help and encouragement that I have received from my colleagues of my department during the hard time.

Finally, I am grateful to my parents for their love and supporting me to complete this research successfully.

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## Abbreviations

<b>AML</b>	Acute myeloid leukemia
<b>APL</b>	Acute promyelocytic leukemia
<b>APCs</b>	Antigen presenting cells
<b>BCL2</b>	B-cell lymphoma 2
<b>BFGF</b>	basic fibroblast growth factor Bone marrow
<b>BM</b>	Bone marrow
<b>CD</b>	Cluster of differentiate
<b>COX</b>	Cyclooxygenase
<b>CRC</b>	Colorectal cancer
<b>CRD</b>	Carbohydrate recognition domain
<b>CR</b>	Complete remission
<b>CT</b>	Cyclic threshold
<b>DCs</b>	Dendritic cells
<b>DEPC</b>	Diethyl pyrocarbonate
<b>DFS</b>	Disease-free survival
<b>ECM</b>	Extracellular matrix
<b>EGFR</b>	epidermal growth factor receptor
<b>ELN</b>	European leukemia net
<b>ERK</b>	Extracellular signal-regulated kinases
<b>FAB</b>	French–American–British
<b>FLT3</b>	Fetal liver tyrosine kinase 3
<b>GAPDH</b>	Glyceraldehyde 3-phosphate dehydrogenase
<b>GSK3</b>	Glycogen synthase kinase 3
<b>HGF</b>	Hepatocyte Growth Factor
<b>HIF</b>	Hypoxia-inducible factors
<b>HIPK2</b>	Homeodomain interacting protein kinase 2

<b>HSCs</b>	Human stem cells
<b>IFN-<math>\gamma</math></b>	Interferon gamma
<b>IL-10</b>	Interleukin 10
<b>IPT</b>	Immunophenotyping
<b>JM</b>	Juxta-membrane
<b>LSCs</b>	Leukemia stem cells
<b>MAPK</b>	Mitogen-activated protein kinase
<b>Mcl-1</b>	myeloid cell leukemia 1
<b>MHC</b>	major histocompatibility complex
<b>MMP</b>	Matrix metalloproteinases
<b>MSCs</b>	Mesenchymal stem cells
<b>MUC1</b>	Mucin 1
<b>NK</b>	Natural killer cell
<b>OS</b>	Overall survival
<b>PB</b>	Peripheral blood
<b>PDGF</b>	Platelet-derived growth factor receptors
<b>PDL-1</b>	Programmed death-ligand 1
<b>qRT-PCR</b>	quantitative reverse transcription Polymerase chain reaction
<b>RNA</b>	Ribonucleic acid
<b>RT-PCR</b>	Reverse transcription Polymerase chain reaction
<b>STAT3</b>	Signal transducer and activator of transcription 3
<b>TCR</b>	T-cell receptor
<b>TIM3</b>	T-cell immunoglobulin mucin 3
<b>Th1</b>	T-helper cell 1
<b>Th17</b>	T-helper cell 17
<b>TNF-<math>\alpha</math></b>	tumor necrosis factor
<b>VEGF</b>	Vascular endothelial growth factor
<b>WHO</b>	World health organization

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## Abstract

### Introduction:

Acute myeloid leukemia (AML) is a malignant hematopoietic disease characterized by an overproduction of immature myeloid cells, (myeloblasts) in the bone marrow in which precursors of blood cells are blocked in an early stage of maturation. AML is a disease of older adults with median range 68 years. Galectins family are animal lectins which affect a wide range of cellular functions. Many galectins are repeatedly reported in several physiological changes and diseases including cancer. In AML, there is a big focus on galectins-3 and -9, but not the other galectins.

**Patients and Methods:** Bone marrow (BM) and corresponding Peripheral blood (PB) were collected from recently diagnosed 45 adult patients with *de novo* acute myeloid leukemia, present in National Cancer Institute (NCI), Cairo University (CU). Our study was carried out to investigate the regulation of galectins expression in the bone marrow and corresponding peripheral blood samples of AML diagnosed patients and correlating them to clinicopathological data.

**Results:** Our results discuss the dysregulation of several galectins in AML patients. Upregulation of galectin-1 has shown a significant correlation to monocytic AML, as it was more upregulated in M4 and M5 ( $p=0.006$  and  $p=0.015$  in bone marrow and peripheral blood respectively), as well as positive CD4, CD11c, and CD64. The same finding was encountered with galectin-2 where its overexpression was also a sign of monocytic AML. The other galectins are statistically significant with many clinicopathological features indicating their clinical significance correlation to monocytic AML. Galectin-3 is almost downregulated in opposite way to the previous studies. The expression of MHC class II is significantly associated with overall survival (OS) advantage ( $p<0.001$ ).

**Conclusion:** Galectin-1 and -2 could be used as markers for monocytic AML. MHC class II could be a good prognostic factor.

**Keywords:** galectins/AML/bone marrow/peripheral blood/ qRT-PCR.