Elucidating the Role of RHOBTB2 in Acute Myeloid Leukemia (AML): A Hunt for a Better Prognosticator

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AML-957

Introduction

Acute Myeloid Leukemia (AML) is an aggressive hematologic malignancy characterized by the clonal proliferation of immature myeloid precursors, resulting in ineffective hematopoiesis. The disease exhibits marked clinical and molecular heterogeneity, with prognosis influenced by various cytogenetic and molecular markers. In India, the incidence of AML is rising, and overall outcomes remain suboptimal. RHOBTB2, a member of the RhoBTB subfamily of Rho GTPases, is emerging as a potential tumor suppressor, although its role in AML remains underexplored.

Aim

To investigate the expression and functional role of RHOBTB2 in AML and its potential as a prognostic biomarker.

Objectives

✓To measure the expression of RHOBTB2 in AML as compared to the controls.
✓ To describe the role of functional role of RHOBTB2 in AML Cell lines.
✓ To analyze the impacts of RHOBTB2 Knockdown in cancer cell survival.

Methods

DESIGN: Retrospective patient sample and cell line-based exploratory study.

Patient Samples
152 AML + 45 Control BMA Collected

RhoBTB2 mRNA Expression Analysis
(RT-qPCR)

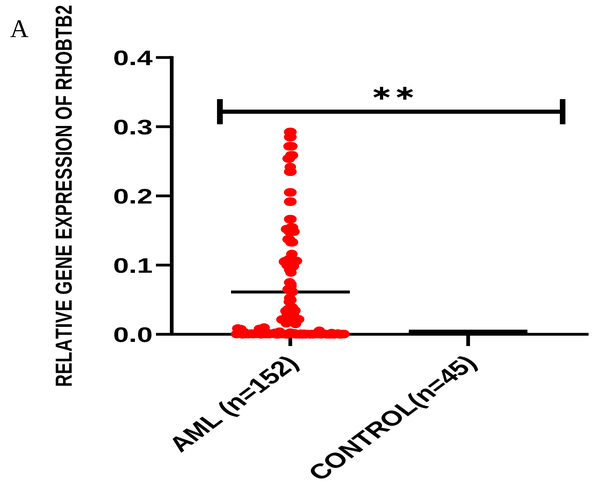
Functional Studies
RhoBTB2 cloned into pLKO.1

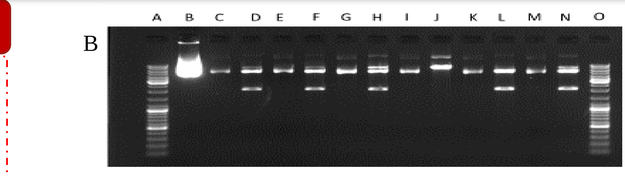
Lentivirus Generated
(Transduced into AML Cell lines: MV4-11)

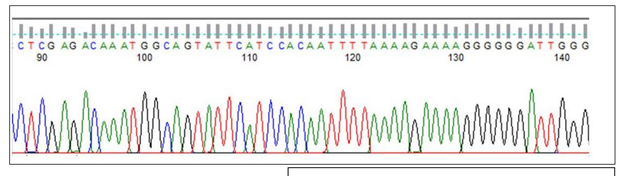
Puromycin Selection & Validation

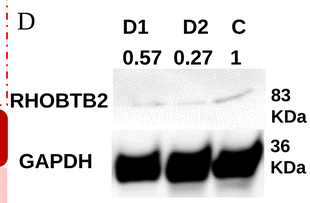
Functional assays
(Cell Cycle and Apoptosis)

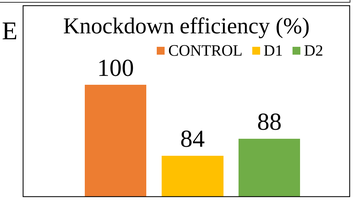
Results



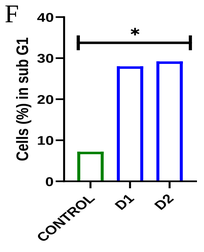


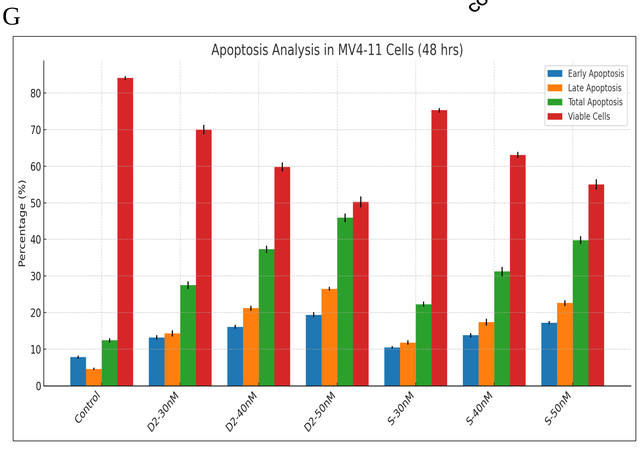






Cell Line Type	Cell Stages			
MV4-11	Sub-G1	G1	S	G2M
CONTROL	7.2%	63.7%	18.6%	10.4%
D1	28%	41%	19.2%	9.4%
D2	29.3%	39.5%	20.7%	9.1%





Summary

✓RHOBTB2 is significantly overexpressed in AML and is associated with key clinical and molecular prognostic indicators, including MRD and FLT3-ITD.
✓Functional suppression of RHOBTB2 disrupts leukemic cell viability, underscoring its potential as a prognostic marker and therapeutic target in AML.

Future Directions

•Validate RHOBTB2 expression and prognostic relevance in larger, multi-center AML cohorts.
•Explore RHOBTB2 regulatory mechanisms and downstream signaling pathways.
•Assess RHOBTB2 as a predictive marker for therapy response.

References

#LIU, Peng, et al. "Identification of RHOBTB2 aberration as an independent prognostic indicator in acute myeloid leukemia." *Aging (Albany NY)* 13.11 (2021): 15269.

Acknowledgement

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