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Genetic biomarkers of drug-resistance: A compass of prognosis and targeted therapy in Acute Myeloid Leukemia

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AML is a highly aggressive hematological malignancy with complex heterogenous genetic and biological nature. Thus, prognostic prediction and targeted therapies might contribute to better chemotherapeutic response. However, the emergence of MDR markedly impedes chemotherapeutic efficacy and dictates poor prognosis. Therefore, prior evaluation of chemoresistance is of great importance in therapeutic decision making and prognosis. Preclinical studies on chemoresistance have unveiled a compendium of underlying molecular basis, which facilitated the development of targetable small molecules. Furthermore, routing genomic sequencing has identified various genomic aberrations driving cellular response during the course of therapeutic treatment through adaptive mechanisms of drug resistance, some of which serve as prognostic biomarkers in risk stratification. In this review, we overview the general mechanisms of drug resistance with novel prognostic or targetable therapeutic strategies in AML. Moreover, we delineate the underlying mechanisms involved in certain AML mutations to provide a better understanding of the association between drug resistance and their clinical prognostic significance.

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