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Title	Flow Cytometric Abnormalities in MDS
Author(s)	Raida Oudat MD. Consultant Hematopathologist. Hematopathology depat. Princess Iman Research and Laboratory Sciences Center. KHMC. Amman-Jordan. Write author(s) name(s), department(s) and institution(s).
E-mail	droudat@hotmail.com
Aim	The myelodysplastic syndromes (MDS) are clonal stem cell diseases characterized by ineffective hematopoiesis with peripheral cytopenia(s), morphological dysplasia, and increased risk of development of acute myeloid leukemia. Flow cytometry (FC) represents a highly sensitive and reproducible method for quantitative and qualitative evaluation of hematopoietic cell maturation. Specific cell surface antigens exhibit expression restricted to a particular cell lineage and others, non-specific ones, are more widely expressed, but with different levels depending on maturation stage. Recognition of these antigens by flow cytometry can aid in the identification of maturation stages and lineage assignment. In disease states alterations in antigenic expression occur, which reflect abnormalities in maturation or function
Materials & Methods	Immunophenotypic abnormalities in MDS have been shown to be highly correlated with morphologic dysplasia and cytogenetic abnormalities. No abnormal marker is specific for the disease. However differentiation block is reflected in patterns of altered antigen expression, as indicated by either altered fluorescence intensity or in the percentage of blasts, maturing myeloid cells, and monocytes which will be reflected as abnormal flow cytometric maturation pattern which could be specific to MDS.
Result	Blasts in MDS can show increased fluorescence intensity for CD117, CD13 or CD33, decreased CD45 and CD38, or aberrant expression of lymphoid antigens such as CD2, CD5, CD7, and CD56, and paradoxical expression of mature myeloid antigens, such as CD65, CD15, CD10, CD11b. Hypogranularity in maturing myeloid cells can show decreased side scatter. Maturing myeloid cells can also show altered maturation patterns of CD13/CD16 and CD11b/CD16 and, or decreased fluorescence intensity of mature myeloid antigens such as CD10, CD15, and CD33. Monocytes can show increased numbers, decreased CD14, CD64, CD33, CD11b, CD13, or aberrant CD56 and CD2 expression. The normal precursor B cells (hematogones) are usually decreased in MDS.
Conclusion	The use of FC in the diagnosis of MDS can be applied with standardized panels and protocols using the most diagnostically useful abnormal antigen patterns. However, large prospective clinical studies must be completed to better define the importance of each abnormality that is easy to interpret, reproducible within and between laboratories, and encodes the maximal information for assisting diagnosis.