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Flow cytometry immunophenotyping analysis of clonal plasma cells in newly diagnosed acute myeloid leukemia with high clinical impact on therapeutic decisions

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Plasmacytosis in the bone marrow biopsies from MDS/AML patients undergoing chemotherapy is often related with a reactive etiology. However, the clinical significance of increased clonal plasma cells at the time of initial AML diagnosis is unclear.

Bone marrow specimens from newly diagnosed MDS/AML were analyzed by 5-color flow cytometry, using cluster analysis of gated data, for the expression of a complete panel of myeloid/plasma cells markers. Multiparameter flow cytometry was able to identify distinct population myeloblasts, rendering a diagnosis of acute myeloid leukemia. In the CD38/CD138 (bright +) areas, two subpopulations of plasma cells can be detected in AML patients, one with a "normal" phenotype [CD19 (+)/CD56 (-) with polytypical light chain], and one with an aberrant phenotype [either CD19 (-)/CD56 (+) or CD19 (-)/CD56 (-) with kappa/lambda immunoglobulin light chain restriction]. The normal subpopulation of plasma cells were detected in all cases, and ranged from 0.1 to 4.6% (mean 1.2%) of total analyzed marrow cells. An abnormal plasma cell subpopulation was detected in 5 cases (at frequency of 4.7%). The identifiable abnormal plasma cells ranged from 0.2 to 16% (mean 4.8%) of total analyzed marrow cells.

Clonal plasma cells can be detected in subset of newly diagnosed MDS/AML bone marrow. The clinical course appeared to be determined by the myeloid neoplasm component. The concomitant plasma cell dyscrasia was indolent and similar to MGUS which was persistent after remission of AML. The molecular pathogenesis and the biological link between MDS/AML and plasma cell dyscrasias need further investigation.

Biography

Mingyi Chen is an assistant professor of Department of Pathology UC Davis. As a physician scientist, he devoted his career largely to biomedical research toward hematologic diseases. His long-term research goals are to define the molecular pathogenesis of malignant hematologic diseases. Thus, laboratory primarily focuses on both the genetic and epigenetic alterations of endothelial cells and hematopoietic cells, with each project guided by methods intended to elucidate basic principles as well as practical solutions. Through cutting-edge technologies and broadly collaborative approaches, he also committed to build a strong, unique and competitive research program that will ultimately benefit patients.