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# Human bone marrow cytogenetics: growth factors stimulate metaphases for specific lineages

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## Abstract

Fresh and/or frozen bone marrow cells from five healthy individuals and seven patients with myeloid leukemia were studied using growth factors and a cytogenetic technique which allows simultaneous analysis of karotype and cell lineage. Cell lineages were identified using monoclonal antibodies in an alkaline phosphatase antialkaline phosphatase staining method. In general, cultures stimulated with a colony stimulating factor containing conditioned medium (CSF) and erythropoietin (EPO) had a higher (approximately 2-fold) mitotic index (MI) than cultures without these growth factors (maximum 7.0 vs. 3.8 after 4-day culture). The significantly higher MI in cultures with growth factors was shown to result from an increase in both erythrocytic and granulocytic-monocytic mitoses. Every culture with CSF and EPO had more erythrocytic metaphases than the identical culture without these growth factors (mean erythrocytic MI 3.1 vs. 0.3, p = 0.01 in healthy subjects; 6.9 vs. 0, p = 0.05 in leukemia). In each of the three patients showing an increased MI where lineage-specific MI was studied, the granulocytic-monocytic MI increased (mean 4.0 vs. 2.1, p = 0.05). These data suggest that growth factors increase the number of metaphases available for cytogenetic analysis from fresh or frozen marrow, and may be used to stimulate metaphases from specific lineages.

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