



Auer rods in mature granulocytes in peripheral blood

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A 55-year-old man with agranulocytosis was diagnosed with acute myeloid leukemia (AML). Atypical eosinophil granulocytes with large basophil but also small pale, structureless granules were observed, and cells with Auer rods in maturing granulopoiesis were noticed in the bone marrow. Panel A shows a mature granulocyte in peripheral blood with many Auer rods in cytoplasm (Pappenheim stained peripheral blood smear, 1000x; Supplementary Material). Auer rods were visible in the peripheral blood in 8% (4/50) of the mature granulocytes. Panel B shows fluorescence-*in-situ*-hybridization with inversion 16 [*inv(16)(p13q22)*] in a bone marrow blast due to rearrangement (split; red and green) of a CBFβ copy (1000x) (Fig. 1).

In bone marrow, atypical (“dirty”) eosinophils with Auer rods in maturing granulopoiesis are suspect for AML with *inv(16)*. Auer rods are not found in mature/physiological granulocytes. However, in bone marrow, Auer rods in maturing granulopoiesis are typical for core-binding-factor AML, like AML with *inv(16)*, and for acute promyelocytic leukemia (APL) with translocation *t(15;17)*. They are part of the malignant clone and an expression of granulocytic differentiation of AML blasts normally arrested in maturation. Therefore, in APL patients with specific/targeted (“*in-vivo*-differentiation”) treatment, namely, all-trans-retinoic acid or arsenic trioxide, Auer rods are sometimes found in mature granulocytes in peripheral blood.

However, Auer rods in mature granulocytes in peripheral blood are very uncommon in cases of AML with *inv(16)*, as

is spontaneous granulocytic differentiation without “*in-vivo*-differentiation” therapy.

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Author contributions ES performed the cytological and flow cytometric diagnostics, and wrote the manuscript. AFP performed the molecular/cytogenetic diagnostics. All authors approved the final version of the manuscript.

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Declarations

Conflict of interest All authors have no competing interests to declare that are relevant to the content of this article.

Ethics approval Ethics approval was not required for this image study.

Patient consent Patient consent was not required for this image study.

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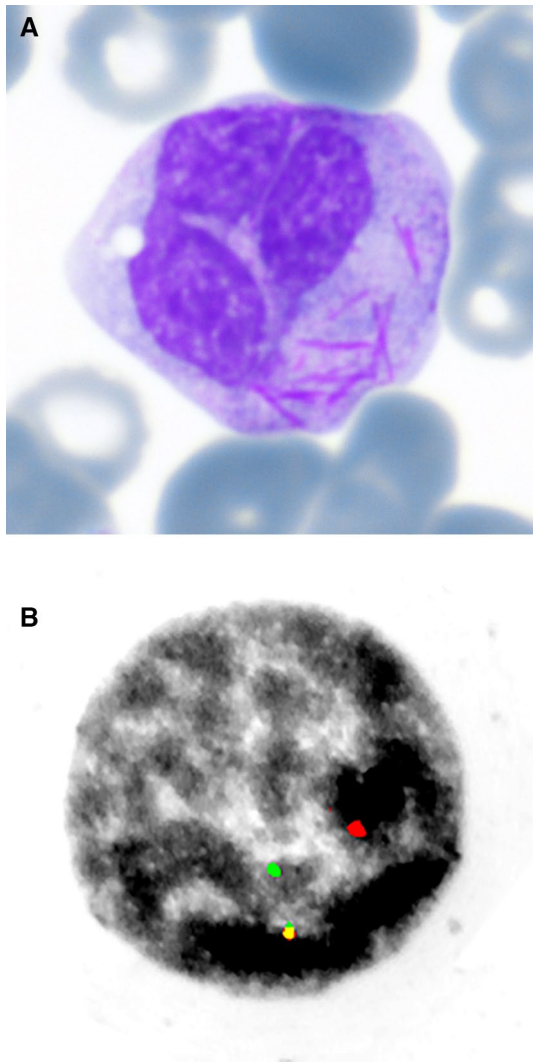


Fig 1. **A** Mature granulocyte in peripheral blood with many Auer rods in cytoplasm (Pappenheim stain, 1000x). **B** Fluorescence-in-situ hybridization with inversion 16 [inv(16)(p13q22)] in a bone marrow blast (split; red and green; 1000x)