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Identification and quantification of high fluorescence-stained lymphocytes as antibody synthesizing/secreting cells using the automated routine hematology analyzer XE-2100

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OBJECTIVES: The aim of this study was to classify and quantify the high fluorescence lymphocytes area (HFL-count) from the SYSMEX XE-2100 leucocyte differential channel as antibody-synthesizing or -secreting cells (ASC, plasma cells or lymphoplasmacytoid cells) in reactive diseases. To unequivocally identify the HFL cells, all possibly eligible cell populations have been investigated: activated B-lymphocytes, activated T-lymphocytes, large granular lymphocytes (LGL), activated monocytes, and immature granulocytes. METHODS: In total, 85 patients were analyzed on the XE-2100 and compared with the automated image analysis system Cellavision Diffmaster 96 based on artificial neural network and immunophenotyping method with the BD FACSCalibur. RESULTS: Reproducibility tests for HFL demonstrated a mean coefficient of variation of 13.9% for very low results and 1.5% for high results. The linearity data showed a good correlation (R(2) = 0.99) between expected and measured HFL. The comparison with possibly eligible cell populations showed no significant correlation between activated monocytes and immature granulocytes, with most immature granulocytes (promyelocyte I or II), natural killer cells or LGLs, activated T-lymphocytes, and sub-T-lymphocytes populations. However, for activated B-lymphocytes an excellent significant correlation with the peripheral blood smear, and the immunophenotyping method has been found with R(2) = 0.900, $P < 0.001$ and R(2) = 0.897, $P < 0.001$, respectively. The slope of 1.1 and intercept of minus 5 cells/microL of the regression equation between HFL-count and ASC (smear) do indicate an excellent quantification of the HFL-count, as well. CONCLUSION: The fully automated SYSMEX XE-2100 HFL-count identifies and quantifies the ASC cells (activated B-lymphocytes) with high precision and reliability in patients without hematology system diseases, thus providing a potential screening and monitoring tool for any patient with suspected infection. Additional studies are required to comprehend in more detail the full clinical utility of an HFL (ASC) count as a potential diagnostic indicator of inflammation, infection, or sepsis. Copyright 2007 Clinical Cytometry Society.

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