



Screening for Malignancy Using Body Fluid Samples on Two Automated Hematology Analyzers: A Comparative Study

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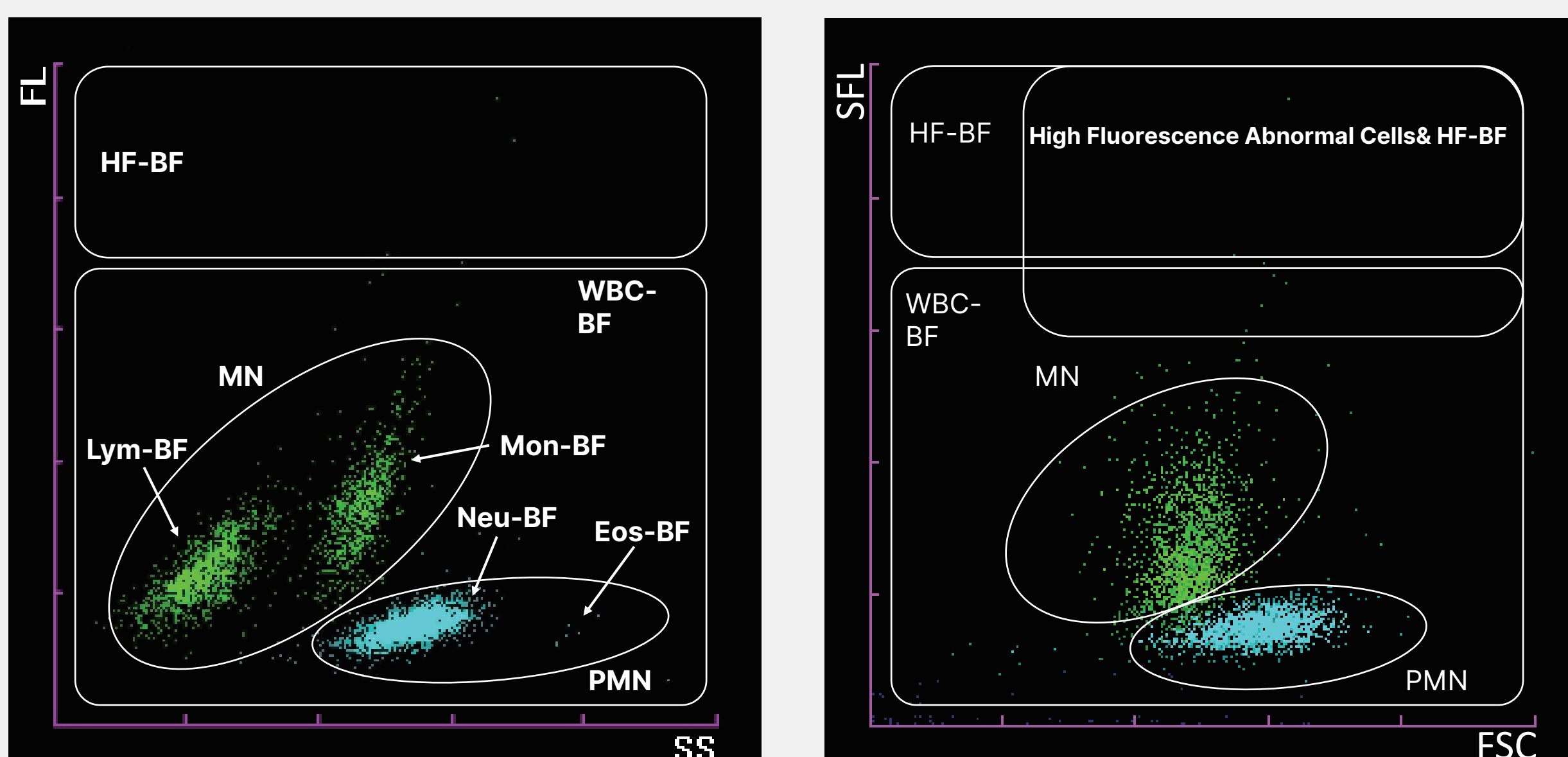
Background

Cytomorphological examination is the direct diagnostic method for detecting tumor cells in body cavity fluids (pleural, peritoneal) and cerebrospinal fluid (CSF), but it is time-consuming and requires significant technical expertise. Automated hematology analyzers provide flags and quantitative parameters for high fluorescence cell percentage - body fluid (HF-BF%), offering a potential rapid screening tool. This study evaluated the diagnostic performance of the "High-Fluorescence Abnormal Cell" flagging and HF-BF% parameter from the Dymind DH-800 series (known as "DH-800" in the following context) and the Sysmex XN-1000 analyzers for screening tumor cells in these fluids.

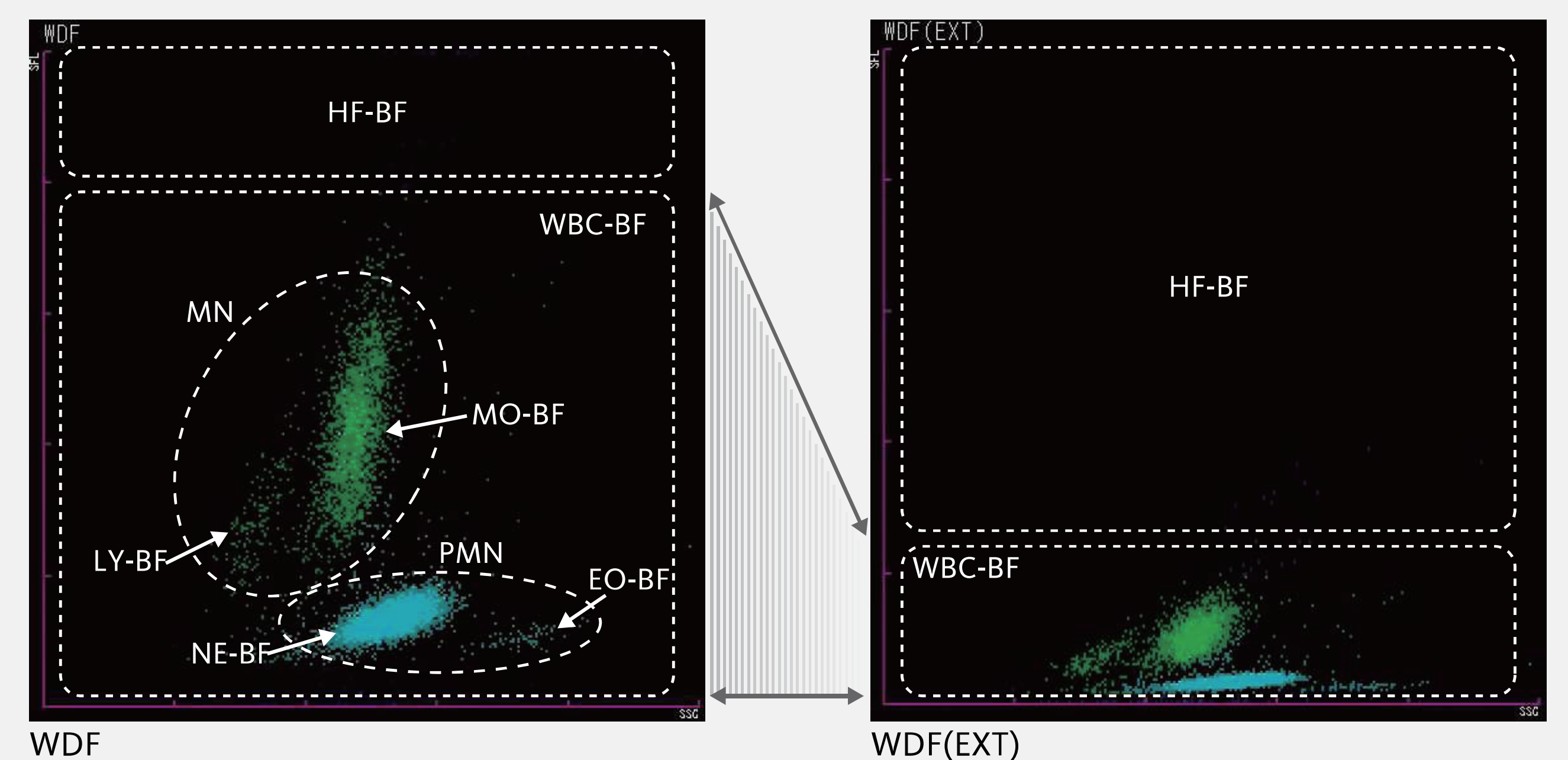
Methods

A total of 260 samples (103 pleural, 75 peritoneal, 82 CSF) were analyzed. All samples were processed on both the Dymind DH-800 and Sysmex XN-1000 analyzers to obtain the high-fluorescence cell flagging and the HF-BF% parameter, respectively. Cytomorphological examination served as the gold standard for the presence of tumor cells. Receiver Operating Characteristic (ROC) curve analysis was used to determine optimal cut-off values and to assess diagnostic performance (sensitivity, specificity, area under the curve - AUC).

Dymind DH-800



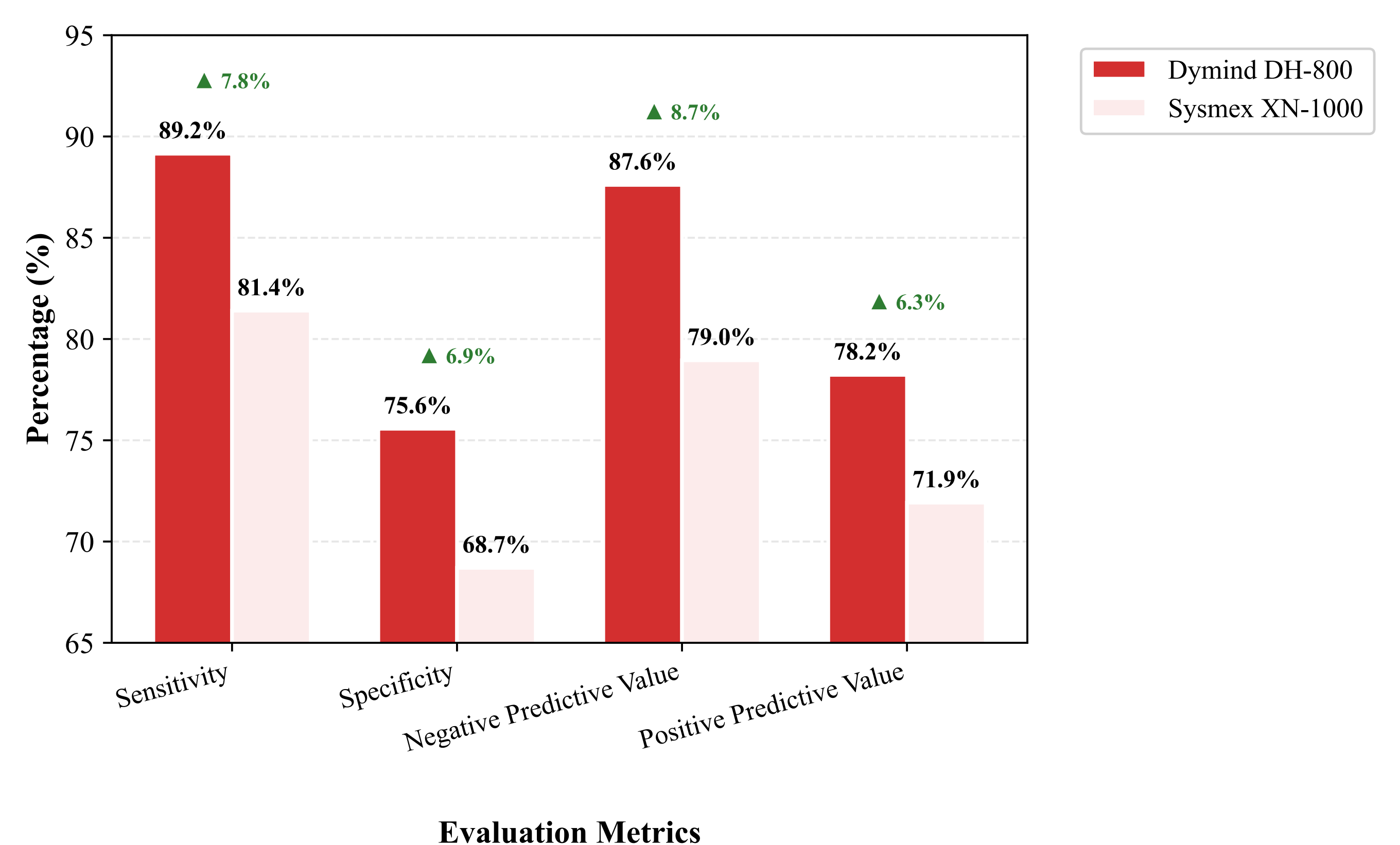
Sysmex XN-1000



Results

Cytomorphology identified tumor cells in 129 of the 260 samples. ROC analysis for the capability of detecting high fluorescence abnormal cells using DH-800 showed an AUC of 0.82, with a sensitivity of 89.15% and specificity of 75.57%. For the Sysmex XN-1000, using its HF-BF% parameter at the manufacturer's suggested threshold, the sensitivity and specificity were 81.40% and 68.70%, respectively.

Performance Statistics of High Fluorescence Abnormal Cell Flagging



Conclusion

This study confirms that automated high-fluorescence abnormal cell flags are effective for screening body fluids for malignancy. The newly developed Dymind DH-800 analyzer showed significantly better diagnostic performance than the established Sysmex XN-1000, offering higher sensitivity and specificity. Implementation of these parameters, particularly on the DH-800, can optimize laboratory workflow by reliably identifying samples that require urgent cytomorphological examination.