Literature list – Blood Bank mode

Customer information

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Note: Whether references are given in British or American English depends on the original.

NEW	New entries are highlighted by this icon.

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Sysmex Europe SE · Bornbarch 1, 22848 Norderstedt, Germany · Phone +49 40 52726-0 · Fax +49 40 52726-100
info@sysmex-europe.com · **www.sysmex-europe.com**

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General

NEW **Valina O *et al*. (2024)**

Validation of the Sysmex XN analyser and Blood Bank mode for the quality and safety of donor blood and transfusion products.
Transfus Med; online ahead of print

https://onlinelibrary.wiley.com/doi/10.1111/tme.13028

Summary: The XN analyser, equipped with a Blood Bank mode, demonstrated reliable performance when used for CBC blood donor evaluation and assessment of end blood products' quality (RBC, HCT, HGB, PLT) and safety (rWBC, rRBC and residual PLT) compared against manual method using counting chamber.

Bell S *et al*. (2021)

Comparison of four methods to measure haemoglobin concentrations in whole blood donors (COMPARE): A diagnostic accuracy study.
Transfus Med; 31(2): 94

Free online: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8048787/

Summary: Four haemoglobin measurement methods in 21.840 blood donors recruited from 10 NHSBT centres in England were investigated against reference (XN analyser). The proportion of donors who would have been inappropriately bled ranged from 2.2% to 18.9%. The proportion of donors who would have been deferred incorrectly with haemoglobin concentration above the minimum threshold ranged from 0.1% to 20.3%.

Rabcuka J *et al*. (2022)

Metabolic reprogramming under hypoxic storage preserves faster oxygen unloading from stored red blood cells.
Acta Haematol; 6(18): 5415

Free online: https://ashpublications.org/bloodadvances/article/6/18/5415/485663/Metabolic-reprogramming-under-hypoxic-storage

Summary: In this study, relative to standard blood bank storage protocols, hypoxic storage preserves faster O_2 unloading from red blood cells in RBC units stored up to 35 days. The effect correlated with Sysmex XN RBC side-scatter (RET-RBC-Z) from RET channel.

Sysmex Europe SE · Bornbarch 1, 22848 Norderstedt, Germany · Phone +49 40 52726-0 · Fax +49 40 52726-100
info@sysmex-europe.com · **www.sysmex-europe.com**

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Arisawa F *et al.* (2021)

Evaluation of the Blood Bank mode Software of Sysmex XN-1000 Hematology Analyzer for Counting Residual Red Blood Cells and Platelets in Platelet concentrates, and Residual White Blood Cells in Leucocyte-Reduced Whole Blood.
Sysmex J Int; 31(2): 18

Free online: https://www.sysmex.co.jp/en/products_solutions/library/journal/Vol31_No2/summary01.html

Summary: The study investigated Blood Bank mode (XN-1000) analytical performance of rRBC (0-5000/µL), rWBC (0-30/µL) with standard blood components counting methods and the PLT correlation with XS-1000i. The authors suggested due to the comparable results that it is possible to measure rRBC, rWBC, and platelet counts for quality control in one sample using the Blood Bank mode.

Sysmex Europe SE · Bornbarch 1, 22848 Norderstedt, Germany · Phone +49 40 52726-0 · Fax +49 40 52726-100
info@sysmex-europe.com · **www.sysmex-europe.com**

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Residual White Blood Cells

Genicco A *et al.* (2023)

Verification of leukocyte contamination in leucodepleted blood components using Blood Bank mode of Sysmex XN-1000 haematology analyzer.
La Rivista Italiana della Medicina di Laboratorio; 19(1): 30

https://www.minervamedica.it/en/journals/medicina-laboratorio/article.php?cod=R54Y2023N01A0030

Summary: The authors found that the residual WBC counting methods ADAM and the XN Blood Bank mode had an agreement of 100% for K2EDTA samples. Both methods exhibited excellent linearity and precision results and adequate limit of quantification values. The bias between XN BB mode and ADAM increased slightly over storage time. Performance of residual RBC count on XN BB mode was in agreement with results published by Cavagnetto et al. in 2021.

Lagerberg JW *et al.* (2020)

Improved accuracy in counting residual white blood cells in red cell concentrates using new blood bank mode software of SYSMEX XN-1000 hematology analyzer.
Transfusion; 60(10): 2456

https://onlinelibrary.wiley.com/doi/10.1111/trf.15985

Summary: The authors re-calculated their results with the updated XN software for Blood Bank mode and observed a very good linear fit between expected and observed values for residual WBC in red cell concentrates (RCC). The previous underestimation of residual WBC in RCC (Blanco RA *et al.*) was solved with the updated XN software (XN IPU SW 22.15).

Blanco RA *et al.* (2020)

The use of a hematology analyzer with a new generation of software as an alternative to flow cytometry for enumerating residual white blood cells in blood components.
Transfusion; 60(1): 155

Free online: https://onlinelibrary.wiley.com/doi/full/10.1111/trf.15606

Summary: In this study, the performance of the XN Blood Bank (BB) mode for residual WBC (rWBC) enumeration in blood components was analysed. In platelet, plasma and RBC components spiked with WBC, the BB mode demonstrated a LOQ of 2 WBC/µL and an excellent concordance with flow cytometry (FC) results. In components obtained from a routine blood bank, the BB mode successfully identified leukodepletion failures and met the guideline criteria of 90% of tested components containing less than 1×10^6 rWBC/unit, which was in agreement with FC results.

Sysmex Europe SE · Bornbarch 1, 22848 Norderstedt, Germany · Phone +49 40 52726-0 · Fax +49 40 52726-100
info@sysmex-europe.com · **www.sysmex-europe.com**

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Mack S *et al.* (2020)

Component residual white blood cell counting made easy?
Transfusion; 60(1): 4

Free online: https://onlinelibrary.wiley.com/doi/full/10.1111/trf.15642

Summary: A short review on required detection levels for blood products in US and Europe, and currently used methods on residual white blood cell counting. An outlook is given based on the publication by Blanco *et al.* how XN-Series analysers could increase the efficiency and reduce costs in blood banks in the future.

Residual Red Blood Cells

Cavagnetto C *et al.* (2021)

Residual red cells in blood components: A multisite study of fully automated enumeration using a hematology analyzer.
Transfusion; 61(2): e258

Free online: https://onlinelibrary.wiley.com/doi/10.1111/trf.16196

Summary: In this study, the Blood Bank mode was tested at multiple sites and showed very good performance characteristics, with an LoD/LoQ of 6 RBC/µL and excellent linear correlation between expected and observed values in spiking experiments. Moreover, in a batch of routine manufactured blood components the Blood Bank mode identified all residual RBC contaminated samples correctly.