RELIABLE, REPORTABLE WBC DIFFERENTIAL RESULTS
THROUGH INNOVATIVE DATA COLLECTION AND ANALYSIS

VCS 360, DataFusion and enhanced Coulter Principle technology

Gain greater confidence in white blood cell (WBC) differentials through innovative data collection and analysis with VCS 360 technology, DataFusion and enhanced Coulter Principle. The DxH 900 hematology analyzer enables laboratories to deliver WBC results with high efficiency and outstanding performance, facilitating abnormal cell detection without the need for additional modes or added cost.

The DxH 900 hematology analyzer provides:

› **Reliable and reportable WBC differential results on the "first run" through VCS 360, DataFusion technology and the enhanced Coulter Principle—without the need for additional modes or reagents.**

› **State-of-the art detection of abnormal cells**

› **Cellular morphology data for disease research in oncology, hematology, infections and anemia**

Receive reliable and reportable WBC differential results on the "first run" with VCS 360 and DataFusion

› DxH 900 WBC differential technology utilizes thorough biophysical characterization of blood cells with five light-scatter angles, digital conductivity and enhanced Coulter Principle. Cells are not altered by stains or other chemical reactions and undergo near-native flow cytometric analysis for correct recognition and classification, even in very abnormal samples

› Direct measurement of standard 5-part differential WBC subtypes without relying on calculations to count basophils
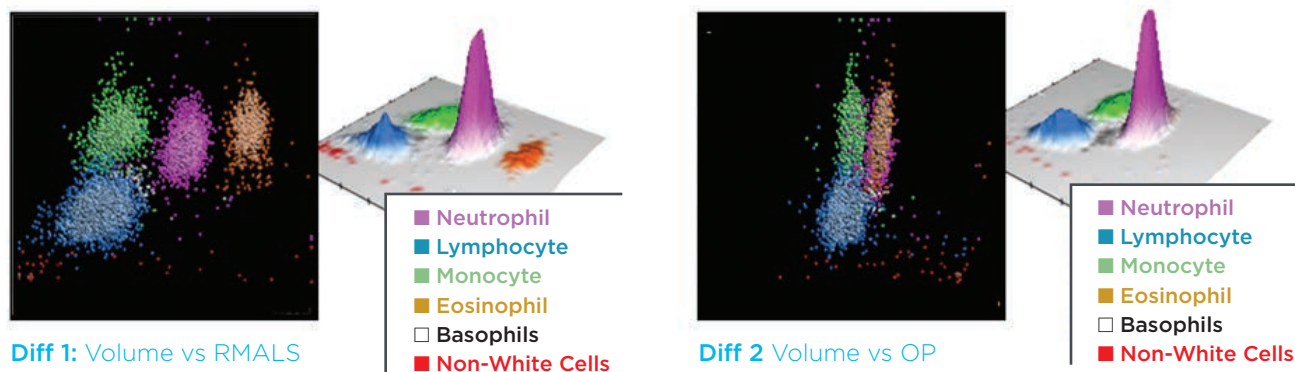
BECKMAN COULTER

Move healthcare forward.

> WBC flagging, provided by DataFusion technology, enhances analysis and overall efficiency through data cross-referencing from multiple modules—differential, CBC and NRBC analysis

> Customizable flagging for disease and patient populations—such as pediatric, oncology and infection disease—supports patient care. Customers can choose the sensitivity level for the flags (e.g., "Left Shift," "Imm Grans," "Variant Lymphs")

> Count extension up to 50,000 cells per sample helps to produce a reportable WBC differential for samples with lyse-resistant RBC

> Extended counting time for samples with low WBC count—for example for patients on chemotherapy—to produce reportable results after first run for every sample without the need for additional modes

> Optical WBC count* is available with the DxH 900 analyzer, providing an estimation of the patient's WBC count[†1] for challenging samples with high degrees of interference and impedance-based WBC counts that are "R" flagged

> Auto-correction for results, including RBC, HGB, MCV, HCT, MCH, MCHC, RDW and RDW-SD,[2] helps provide results for abnormal samples with high WBC counts, including infections and malignancy

Benefit from state-of-the-art detection of abnormal cells

> VCS 360 technology with DataFusion flags and pre-classify blast cells to help guide manual review (flags "Ly Blast," "Ne Blast," "Mo Blast")

> Research-use-only early granulated cells (EGC)* parameter for immature granulocytes detection is available. Research literature shows that EGC* in routine workflow may reduce the number of slide reviews up to 35%[†3-5]
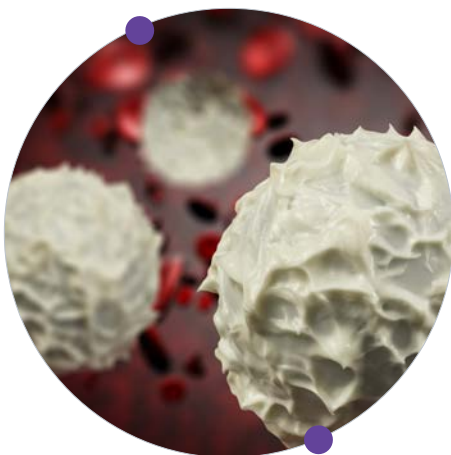
> DxH 900 technology provides detailed cellular analysis with cellular morphometric data (CMD). Customer–defined decision rules which can include 70 CMD parameters provide unlimited capabilities for advanced performance of abnormal cell detection.[†] There is no additional middleware needed to create decision rules for specific patient populations

> The DxH 900 has the capability to automatically rerun and incorporate additional tests from the system menu by using predefined decision rules, without the need for extra hardware or middleware

Diff 1: Volume vs RMALS

- ■ Neutrophil
- ■ Lymphocyte
- ■ Monocyte
- ■ Eosinophil
- □ Basophils
- ■ Non-White Cells

Diff 2 Volume vs OP

- ■ Neutrophil
- ■ Lymphocyte
- ■ Monocyte
- ■ Eosinophil
- □ Basophils
- ■ Non-White Cells

Gain access to cellular morphology data

› Extensive peer-reviewed literature describes the power of cellular moprhology data for disease research in the following areas:

- Myelodysplastic syndrome*†[6-9]

- Reactive versus malignant lymphocytosis*†[7, 10]

- Bacterial infection*†[11-15]

- Viral infection*†[16-18]

- Malaria and dengue*†[19-23]

- Megaloblastic anemia*†[24-26]

- Tuberculosis*†[27]

- Earlier stem cell harvesting time*†[28-30]

DxH 900 hematology analyzer: The right results, the first time

The DxH 900 empowers hematology decisions through near native-state cellular characterization, ensures predictable costs through a 93% first-pass yield[31] and maximizes staff time

Discover how DxH 900 delivers reliable, reportable WBC differential results through innovative data collection and analysis. **Visit www.beckmancoulter.com/DxH900**

References

1. Crispin P, Andriolo K, Naumovski J, Stapleton J. "Validation of White Cell Differential Optical Count on the DxH 800." *Int Jnl Lab Hem,* vol. 39 (Suppl. 2). 2017, p. 30.

2. Beckman Coulter Diagnostics. DxH Instructions for Use (IFU) (DxH 800 B26647AE). pp. 2–16.

3. Hotton J, Broothaers J, Swaelens C, Cantinieaux B. "Performance and Abnormal Cell Flagging Comparisons of Three Automated Blood Cell Counters." *Am J Clin Pathol,* vol. 140. 2013, pp. 845–52.

4. Pastoret C, Sunnaram BL, Fest T, Roussel M. "Integration of Immature Granulocytes Quantification With the Version 2.0 UniCel DxH 800 in the HematoFlow Strategy." *Am J Clin Pathol,* vol. 145. April 2016, pp. 552–9.

5. Lahlou H, Beukinga I, Kassengera Z, Penninck D, Brauner J, Pradier O. "No Need for Microscopy or Flow Cytometry to Quantify Myelemia in Daily Haematology Laboratory Practice." *Int Jnl Lab Hem,* vol. 36 (Suppl. 1). 2014, p.34.

6. Miguel A, Orero M, Simon R, Collado R, Perez PL, Pacios A, Iglesias R, Martinez A, Carbonell F. "Automated Neutrophil Morphology and Its Utility in the Assessment of Neutrophil Dysplasia." *Lab Hematol,* vol. 13, 2007, pp. 98–102.

7. Haschke-Becher E, Vockenhuber M, Niedetzky P, Totzke U, Gabriel C. "A New High-throughput Screening Method for the Detection of Chronic Lymphatic Leukemia and Myelodysplastic Syndrome." *Clin Chem Lab Med,* vol. 46, no. 1. 2008, pp. 85-88.

8. Raess PW, van de Geijn G-JM, Njo TL, Klop B, Sukhachev D, Wertheim G, McAleer T, Master SR, Bagg A. "Automated Screening for Myelodysplastic Syndromes Through Analysis of Complete Blood Count and Cell Population Data." *Am J Hematol,* vol. 89, no. 4. April 2014, pp. 369–74.

9. Yamaguchi N, Matsusita Y, Okamoto T, Yamazaki M. "Usefulness of Detection of Myelodysplastic Dysplasia Using Neutrophil Cell Population Data." *Int Jnl Lab Hem,* vol. 39 (Suppl. 2). 2017, p. 128.

10. Jean A, Boutet C, Lenormand B, Callat M-P, Buchonnet G, LeClerc C, Vasse M. "Combination of Cellular Population Data and CytoDiff Analyses for the Diagnosis of Lymphocytosis." *Clin Chem Lab Med,* vol. 49(11). 2011, pp. 1861–8.

11. Park D-H, Park K, Park J, Park H-H, Chae H, Lim J, OH E-J, Kim Y, Park Y-J, Han K. "Screening of Sepsis using Leukocyte Cell Population Data from the Coulter Automatic Blood Cell Analyzer DxH 800." *Int Jnl Lab Hem,* vol. 33. 2011, pp. 391–9.

12. Lee A-J, Kim S-G. "Mean Cell Volumes of Neutrophils and Monocytes are Promising Markers of Sepsis in Elderly Patients." *Blood Res,* vol. 48, no. 3. Sept 2013, pp. 193–7.

13. van de Geijn G-JM, Denker S, Meuleman-van Waning V, Koeleman HGM, Birnie E, Braunstahl G-J, Njo TL. "Evaluation of New Laboratory Tests to Discriminate Bacterial from Nonbacterial Chronic OPbstructive Pulmonary Disease Exacerbations." *Int Jnl Lab Hem,* vol. 38, no. 6. 2016, pp. 616–28.

14. Abiramalatha T, Santhanam S, Mammen JJ, Rebekah G, Shabeer MP, Choudhury J, Nair SC. "Utility of Neutrophil Volume Conductivity Scatter (VCS) Parameter Changes as Sepsis Screen in Neonates." *J Perinatol,* vol. 36, no. 9. 2016, pp. 733–8.

15. Crouser ED, Parrillo JE, Seymour C, Angus DC, Bicking K, Tejidor L, Magari R, Careaga D, Williams J, Closser DR, Samoszuk M, Herren L, Robart E, Chaves F. "Improved Early Detection of Sepsis in the ED With a Novel Monocyte Distribution Width Biomarker." *Chest,* vol. 152, no. 3. 2017, pp. 518–26.

16. Jung Y-J, Kim J-H, Park Y-J, Kahng J, Lee K-Y, Kim MY, Han K, Lee W. "Evaluation of cell population data on the UniCel DxH 800 Coulter Cellular Analysis system as a screening for viral infection in children" *Int Jnl Lab Hem,* vol. 34. 2012, pp. 283–9.

17. Zhu Y, Cao X, Tao G, Xie W, Hu Z, Xu D. "The Lymph Index: A Potential Hematological Parameter for Viral Infection." *Int J Infect Dis,* vol. 17, no. 7. 2013, pp. e490–3.

18. Meiling W, Chenxue Q. "Screening of Viral Infection Using Peripheral Lymphocyte Cell Population Data on the UniCel DxH 800 Coulter Cellular Analyzer." *Int Jnl Lab Hem,* vol. 37 (Suppl. 2). 2015, p. 83.

19. Briggs C, Da Costa A, Freeman L, Aucamp I, Ngubeni B, Machin SJ. "Development of an Automated Malaria Discriminant Factor Using VCS Technology." *Am J Clin Pathol,* vol. 126. 2006, pp. 691–8.

20. Lee HK, Kim SI, Chae H, Kim M, Lim J, Oh EJ, Kim Y, Park YJ, Lee W, Han K. "Sensitive Detection and Accurate Monitoring of Plasmodium Vivax Parasites on Routine Complete Blood Count Using Automatic Blood Cell Analyzer." *Int J Lab Hematol,* vol. 34. 2012, pp. 201–7.

21. Shin S, Park SH, Park J. "Incidental Identification of Plasmodium Vivax During Routine Complete Blood Count Analysis Using the UniCel DxH 800." *Ann Lab Med,* vol 38. 2018, pp. 165–8.

22. Sharma P, Bhargava M, Sukhachev D, Datta S, Wattal C. "LH750 Hematology Analyzers to Identify Malaria and Dengue and Distinguish them from Other Febrile Illnesses." *Int Jnl Lab Hem,* vol. 36. 2014, pp. 45–55.

23. Kelkar A, Doshi P, Shelke P, Nimbargi R. "Effective Use of Volume, Conductivity, Scatter (VCS) Parameters for Prediction of Dengue Virus Infection: Analysis of Data From a Tertiary Care Teaching Hospital in Western India." *Int Jnl Lab Hem,* vol. 37 (Suppl. 2). 2015, p. 36.

24. Risch C, Medina P, Nydegger UE, Bahador Z, Brinkmann T, Von Landenberg P, Risch M, Risch L. "The Relationship of Leukocyte Anisocytosis to Holotranscobalamin, A Marker of Cobalamin Deficiency." *Int J Lab Hematol,* vol. 34, no. 2. 2012, pp. 192–200.

25. Totoskovic D, Dopsaj V, Martinovic J. "Methylmalonic Acid and Neutrophil Morphometric Index in Laboratory Diagnosis of Cobalamin Deficiency Without Macrocytosis." *Int Jnl Lab Hem,* vol. 38. 2016, pp. 265–72.

26. Totoskovic D, Dopsaj V, Martinovic J. "Evaluation of Cell Population Data as Potential Markers of Cobalamin and Folate Deficiency in Populations at Risk with Regard to Renal Function." *J Appl Biomed,* vol. 15, no. 3. 2017, pp. 204–9.

27. Park J, Lee H, Kim Y-K, Kim KH, Lee W, Lee K-Y, Park Y-J, Kahng J, Kwon HJ, Kim Y, Oh E-J, Lim J, Kim M, Han K. "Automated Screening for Tuberculosis by Multiparametric Analysis of Data Obtained During Routine Complete Blood Count." *Int Jnl Lab Hem,* vol. 36. 2014, pp. 156–64.

28. Golubeva V, Mikhalevich J, Novikova J, Tupizina O, Trofimova S, Zueva Y. "Novel Cell Population Data from a Haematology Analyzer can Predict Timing and Efficiency of Stem Cell Transplantation." *Transfus and Apher Sci,* vol. 50. 2014, pp. 39–45.

29. Villa CH, Porturas T, Sell M, Wall M, DeLeo G, Fetters J, Mignono A, Irwin L, Hwang W-T, Una O'Doherty U. "Rapid Prediction of Stem Cell Mobilization Using Volume and Conductivity Data from Automated Hematology Analyzers." *Transfus,* vol 58 no. 2. 2018, pp. 330-338.

30. Shin S, Cho SR, Kim S, Choi JR, Lee K-A. "Identification of Cell Morphology Parameters from Automatic Hematology Analyzers to Predict the Peripheral Blood CD34-positive Cell Count After Mobilization." *PLoS ONE,* vol. 12, no. 3. 2017, p. e0174286.

31. DxH series side-by-side results documentation.

*For research use only. Not for use in diagnostic procedures.
†Establishing clinical utility requires validation through a controlled clinical trial.

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