Understanding Element HT5 Analyzer Scatterplots

The Element HT5 Veterinary Hematology Analyzer by Heska is a multi-channel analyzer utilizing laser flow cytometry, impedance technology, and colorimetric detection to rapidly and accurately determine red blood cell, white blood cell and platelet parameters.

In order to more fully understand the scatterplot representation of the white blood cells (lymphocytes, monocytes, neutrophils, eosinophils), it is helpful to have a basic understanding of the measurement principles of the Element HT5.
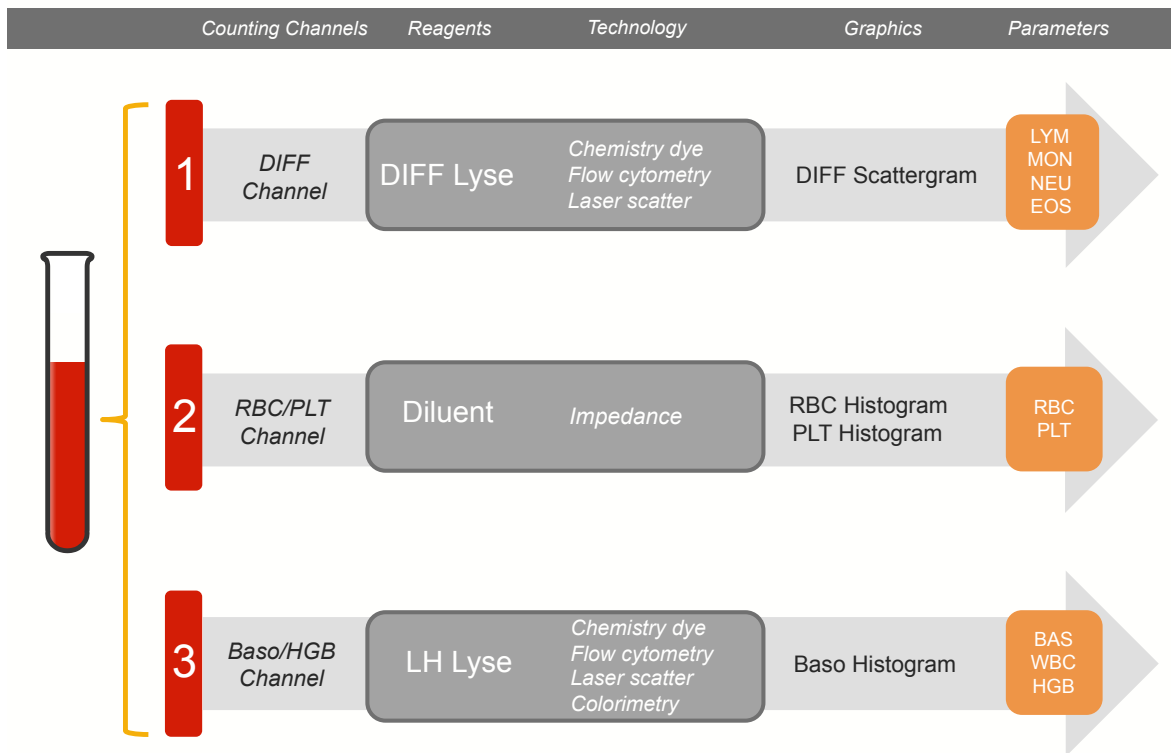
The analyzer utilizes a 3-part reagent system consisting of Diluent, Diff Lyse and LH Lyse to deliver these parameters, including a 5-part differential for white blood cells.

15 uL of anticoagulated, whole blood sample is aspirated, diluted and then divided to be processed by lysing reagents. Treated sample is characterized in one of three discrete measuring channels:
- Diff Channel > reports Lymphocytes, Monocytes, Neutrophils, Eosinophils
- RBC/PLT Channel > reports RBC & PLT
- Baso/HGB Channel > reports Basophils, WBC, HGB

For the purposes of understanding scatterplots, this piece will focus on the Diff Channel. It is useful to note that the Baso/HGB Channel is also involved in the overall WBC count as well as the Basophil count using the LH Lyse reagent in conjunction with colorimetric detection.

Principle

|	Counting Channels	Reagents	Technology	Graphics	Parameters
1	*DIFF Channel*	DIFF Lyse	*Chemistry dye* *Flow cytometry* *Laser scatter*	DIFF Scattergram	LYM MON NEU EOS
2	*RBC/PLT Channel*	Diluent	*Impedance*	RBC Histogram PLT Histogram	RBC PLT
3	*Baso/HGB Channel*	LH Lyse	*Chemistry dye* *Flow cytometry* *Laser scatter* *Colorimetry*	Baso Histogram	BAS WBC HGB

The Diff Lyse reagent will disrupt red blood cells and uses chemical dye to change the properties of the white blood cells. In the Diff Channel, white blood cells are surrounded by sheath fluid and channeled through a counting aperture in single file. Laser light is focused through the counting aperture and detected at multiple angles to accurately characterize cell types.

Tri-angle Laser Scatter
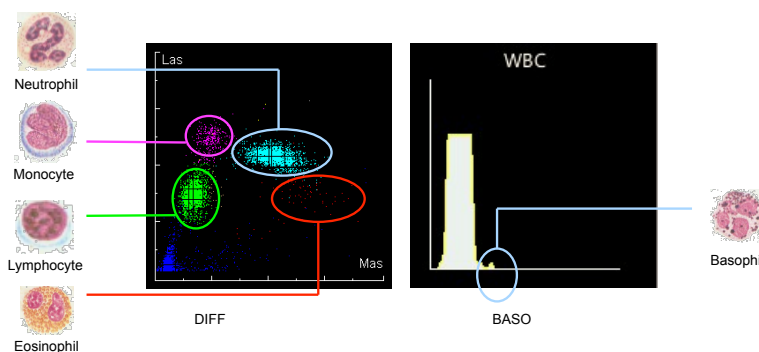Low Angle Scatter (LAS) – Cell Volume
Middle Angle Scatter (MAS) – Cellular Complexity
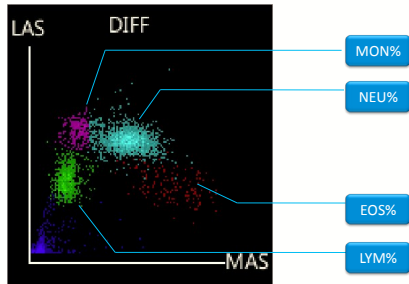Wide Angle Scatter (WAS) – Cellular Granularity
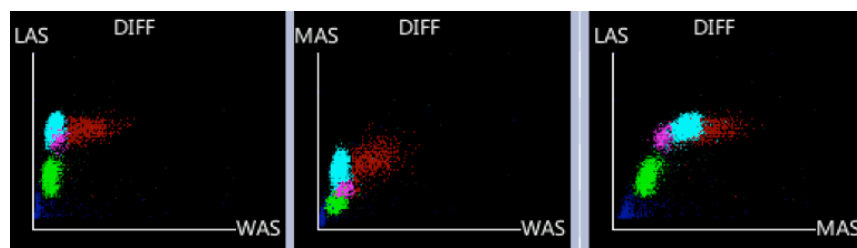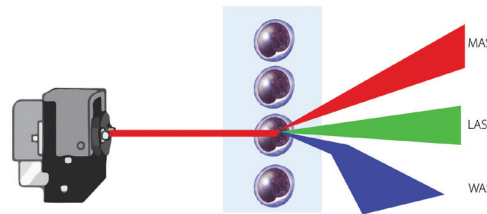
The analyzer rapidly combines output from the three different scatter angles; LAS, MAS, and WAS.

WBC Differential 5-Part

According to size, complexity and granularity information, white blood cells can be differentiated into 5 groups, including lymphocyte, monocyte, neutrophil, eosinophil and basophil.

DIFF Channel

The analyzer will flag individual parameters that are outside of species-specific reference ranges, as well as provide sample pathology messages for specific conditions. In these cases, manual review by blood film should be performed. As the user becomes more familiar with the visual representation of patient results via the scatterplots, they may observe differences in the individual cell types for patients with specific disorders.

For questions or further assistance, please call
Heska's Technical Support Services at 800.464.3752, option 3.