

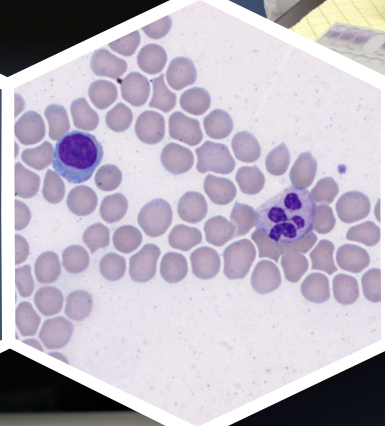
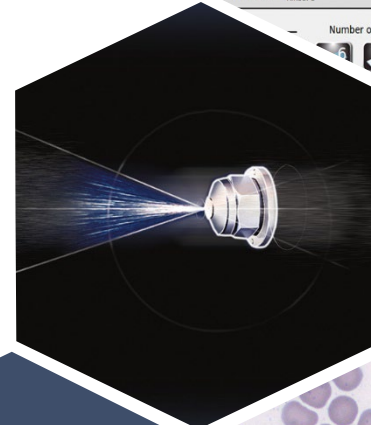
Aerospray® Hematology Pro Slide Stainer/Cytocentrifuge

Product and Sales Training, March 2022
Prepared by: EBS Sales & Marketing



Training Topics

- ✓ Introduction to Hematology Staining
- ✓ Aerospray® Technology & Product Overview
- ✓ Competition
- ✓ CBC Analyzers in the Lab
- ✓ Value Selling with the Pro Stainer
- ✓ Pricing



Introduction to Hematology Staining

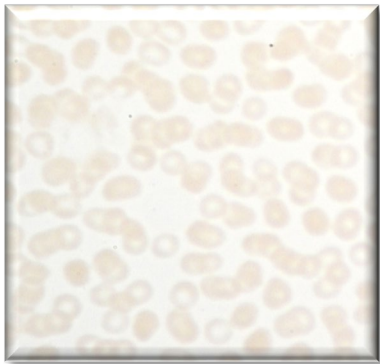


Hematology Slide Staining

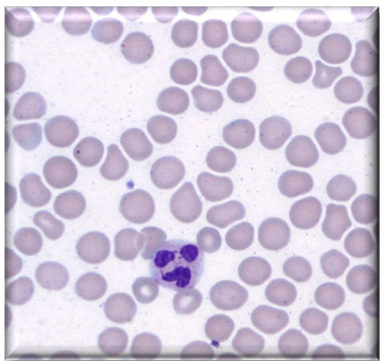
Getting a better look at cells for diagnosis.



Unstained



Stained



- **Microscope Slide Staining is used to better see and identify:**
 - Cells
 - Cell structures
 - Metabolic Processes
 - Living and Dead Cells
- **By using different stains, a nucleus or cytoplasm are easier to view**
- **Most stains can be used on non-living (fixed) cells, while only some types of stain can be used on living cells**



Disease Diagnostics

Determined by viewing different parts of the blood.

Erythrocytes (Red Blood Cells/RBCs) *Transport Oxygen to Body*

Diseases & Conditions:

- Malaria
- Sickle Cell Anemia
- Polychromasia (condition related to different types of diseases)

Thrombocytes (Platelets) *Used to Form Blood Clots*

- Diseases & Conditions:
 - Thrombocytopenia
 - Giant Platelets
 - May-Hegglin Syndrome

Leukocytes (White Blood Cells/WBCs) *Help to Protect Against Diseases*

Types:

1. Granulocytes

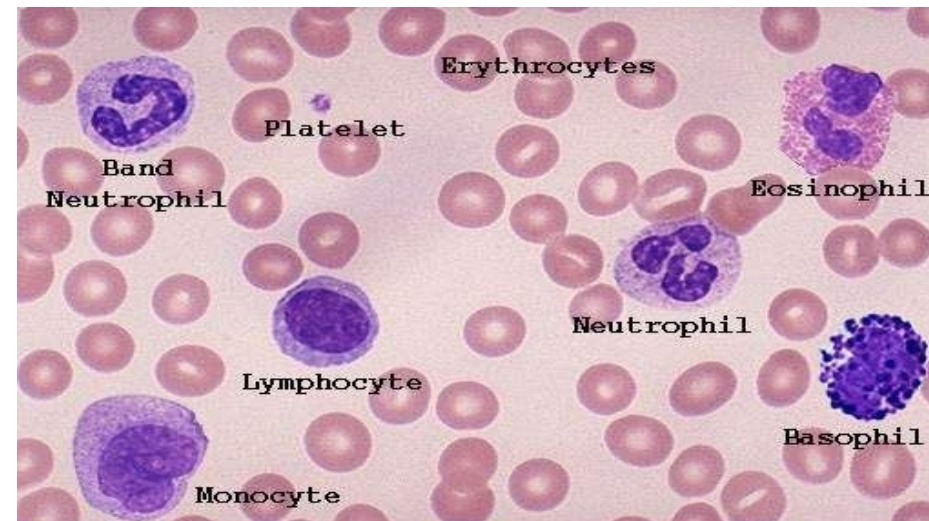
- Neutrophils
- Eosinophils
- Basophils

2. Agranulocytes

- Monocytes
- Lymphocytes

Diseases & Conditions:

- Leukemia
- Epstein-Barr
- Atypical Monocytes
- Abnormal increase/decrease of WBCs



The Romanowsky Hematology Stain

Also known as Romanowsky–Giemsa staining.

- Named after the Russian physician Dmitri Leonidovich Romanowsky, who was one of the first to recognize its potential for use as a blood stain
- Prototypical staining technique that was the forerunner of several distinct but similar stains widely used in hematology
- **Used to:**
 - Differentiate cells for microscopic examination in pathological specimens, especially blood and bone marrow films
 - Detect parasites such as malaria within the blood
- **Stains derived from the Romanowsky-type stains:**
 - Giemsa
 - Jenner
 - Wright
 - Field
 - May–Grünwald
 - Leishman



Dmitri Romanowsky

Romanowsky Hematology Stain Types



Giemsa Stain Type

- ◆ Giemsa stain is considered to be the standard stain for detection and identification of the malaria parasite
- ◆ Composed of "Azure II" and eosin Y with methanol and glycerol as the solvent
- ◆ "Azure II" is thought to be a mixture of azure B (which Giemsa called "azure I") and methylene blue, although the exact composition of "azure I" is considered a trade secret
- ◆ Comparable formulations using known dyes have been published and are commercially available

Field Stain Type

- ◆ Named after physician John William Field, who developed it in 1941
- ◆ Used for staining thick blood films in order to discover malarial parasites
- ◆ Used for rapid processing of the specimens
- ◆ Consists of two parts:
 1. Stain A is methylene blue and Azure 1 dissolved in phosphate buffer solution
 2. Stain B is Eosin Y in buffer solution

Romanowsky Hematology Stain Types



Wright Stain Type

- ◆ Can be used alone or in combination with the Giemsa stain, which is known as the Wright-Giemsa stain
- ◆ Used for the staining of blood and bone marrow films to differentiate blood cell types
- ◆ Usually a mixture of eosin (red) and methylene blue dyes
- ◆ It is named for James Homer Wright, who devised the stain in 1902
- ◆ Used to identify:
 - ◆ Infection
 - ◆ Leukemia
 - ◆ Interstitial Nephritis
 - ◆ UTIs
- ◆ Easily distinguishes between blood cells

Jenner Stain Type

- ◆ Used for staining blood smears
- ◆ It is dark blue (methylene blue eosinate)
- ◆ Clearly stained nuclei for very observable results

Romanowsky Hematology Stain Types



May–Grünwald Stain Type





- ◆ **Two step procedure:**
 1. Stain with May-Grünwald stain, which does not produce the Romanowsky effect
 2. Stain with the Giemsa stain, which does produce the Romanowsky effect
- ◆ **Used for the staining of FNAC slides in a histopathology lab for the diagnosis of tumorous cells**

Leishman Stain Type

- ◆ **In 1901, William Leishman developed a stain that was similar to Louis Jenner's but with the replacement of pure methylene blue with polychromed methylene blue**
- ◆ **Leishman's stain is prepared from the eosinate of polychromed methylene blue and eosin Y using methanol as the solvent**





Stains and Disease States



 Microorganism	 Preferred Stains	 Disease	 Aerospray Stainer
Bacteria			
Bacteria, Usual	Gram, Giemsa	Wide variety of infections	Hematology Pro / Stat
Rickettsia	Giemsa	Rocky Mountain Spotted Fever, typhus fever	Hematology Pro / Stat
Chlamydia	Silver Stains	Pneumonia	Hematology Pro / Stat
Helicobacter pylori	Giemsa, Diff-Quik	Inflammation of stomach, stomach ulcers	Hematology Pro / Stat

Stains and Disease States (Cont.)



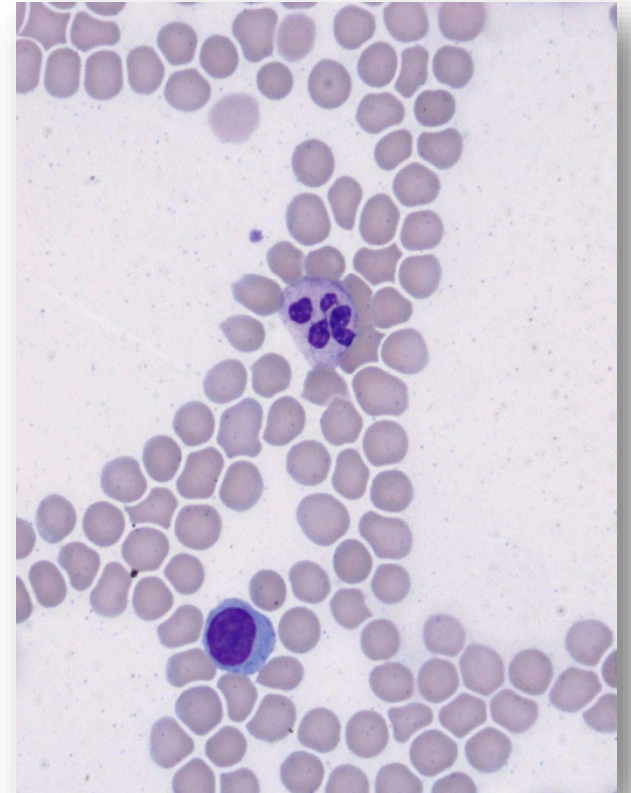
 Microorganism	 Preferred Stains	 Disease	 Aerospray Stainer
Protozoa			
Giardia	Giemsa	“traveler’s diarrhea”	Hematology Pro / Stat
Toxoplasma	Giemsa	Toxoplasmosis in immunocompromised hosts	Hematology Pro / Stat
Cryptosporidium	Giemsa	Diarrhea in AIDS patients	Hematology Pro / Stat
Leishmania	Giemsa	Skin infections, severe generalized infection with anemia and wasting	Hematology Pro / Stat
Plasmodium	Giemsa	Malaria	Hematology Pro / Stat

Source: Kumar, G. L., Kieman, J. A., et. al. (Eds.). (2010). Education Guide: Special Stains and H & E, Second Edition. *Dako North America*.

What End-Users Are Looking For:

Three primary objectives for good Hematology Slide Staining

1. **Correct Coloring** - Based on user preferences. Usually, RBCs are salmon in color. Neutrophilic granules are lilac. Eosinophilic granules are pink to red. The nuclei of WBC are purplish blue.
2. **No Cross Contamination** - stain contamination occurs when supplies, especially stains, are reused for separate slides.
3. **No Stain Precipitate** - Precipitate is fine, dark blue-purple stippled material on the background of the slide and on the cells. It makes identification of small inclusions (Howell–Jolly bodies) or hemoparasites (malaria) difficult.



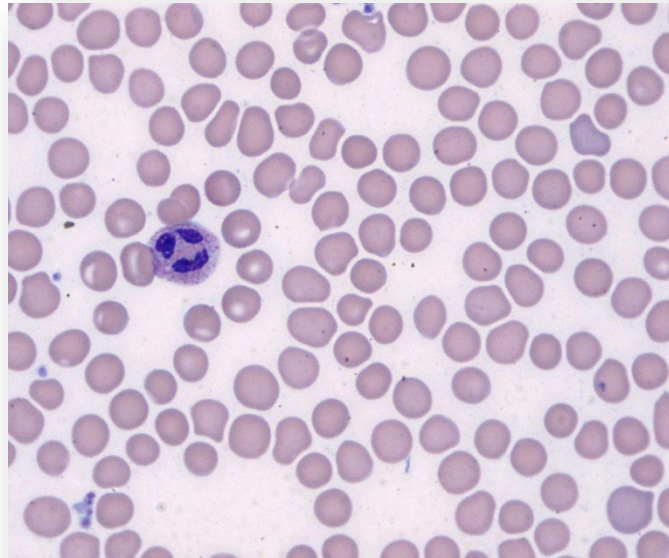
User Preferences in Slide Staining

It's all about user preferences.

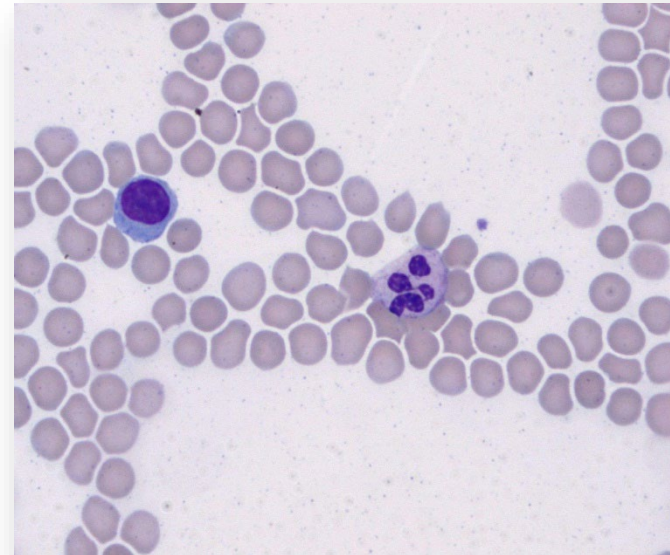
All users will have preferences in slide staining in two areas:

1. Red/Blue Color
2. Intensity: how dark or light the coloring is

Rapid Wright-Giemsa 4



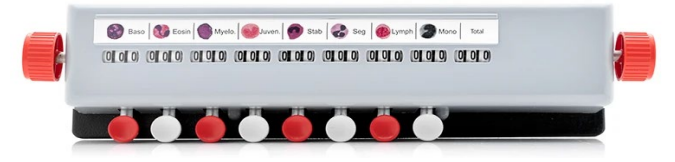
Wright-Giemsa 7



CBC and Differentials

◆ What is a CBC?

- A complete blood count (CBC) measures and counts your blood cells
- It is a very generalized blood test that physicians will order to see if anything is abnormal
- Helps healthcare providers detect a range of disorders, conditions, and screen for diseases
- Checks your blood for signs of medication side-effects so providers can adjust treatments

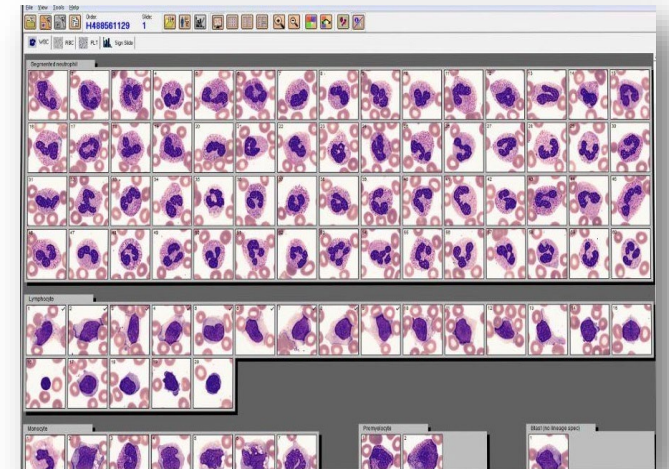


◆ What is the differential section of a CBC?

- The Differential is the identification of the 5 different White blood cell types that are present in your blood, and in what amounts
- Can be done using a manual counter (top) or a digital analyzer (bottom) to get WBC counts

◆ Normal Adult Ranges:

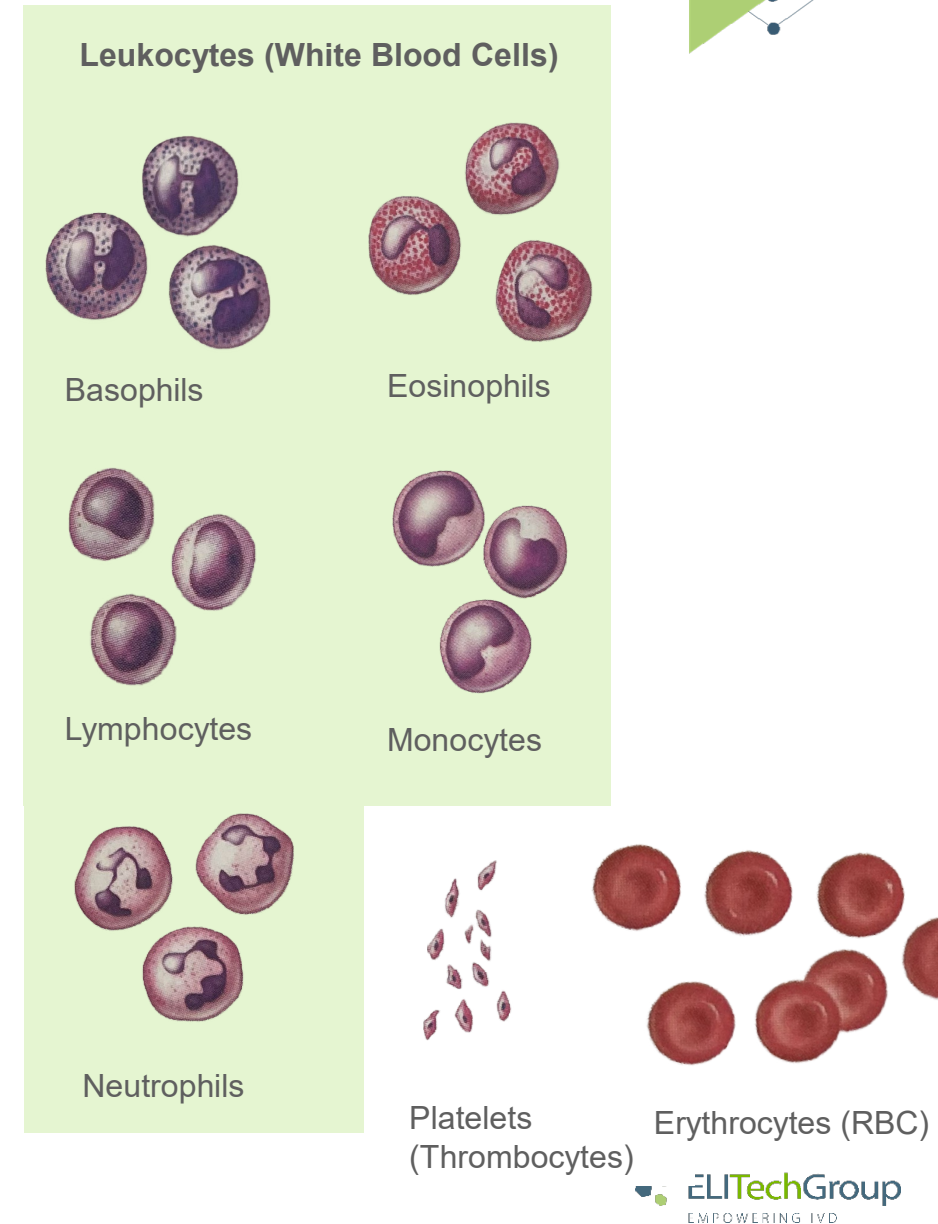
- WBCs 5,000-10,000/microliter
- Platelets 150,000-400,000/microliter
- RBCs 4,000,000-5,000,000/microliter



WBC Differential

Differentiating between different cell types.

- ◆ WBC (White blood cells) are mostly invisible under a microscope before staining
- ◆ WBCs have different classifications based on their staining properties:
 - ◆ Lymphocytes (small cells with round nuclei and little cytoplasm)
 - ◆ Monocytes (large cells with kidney shaped nuclei)
 - ◆ Granulocytes (clearly visible granules when stained)
 - Eosinophils (because they are stained red with eosin)
 - Basophils (because they are stained blue with a “basic stain”)
 - Neutrophils (have little affinity for either stain, most abundant WBC)
- ◆ Abnormal counts of different WBCs can signify different ailments, including a high risk of developing an infection due to low WBC counts
- ◆ Abnormal shapes of the cells are present with different disease states, including leukemia, Hodgkins disease, and others



Laboratory Workflow for Manual Staining

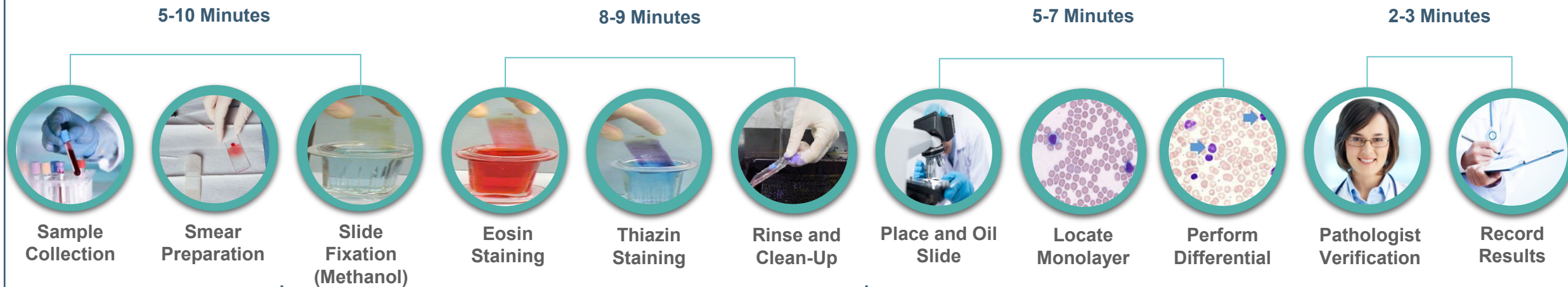
Performing a Single Slide Differential



Slide Staining with Pro/Stat Stainer

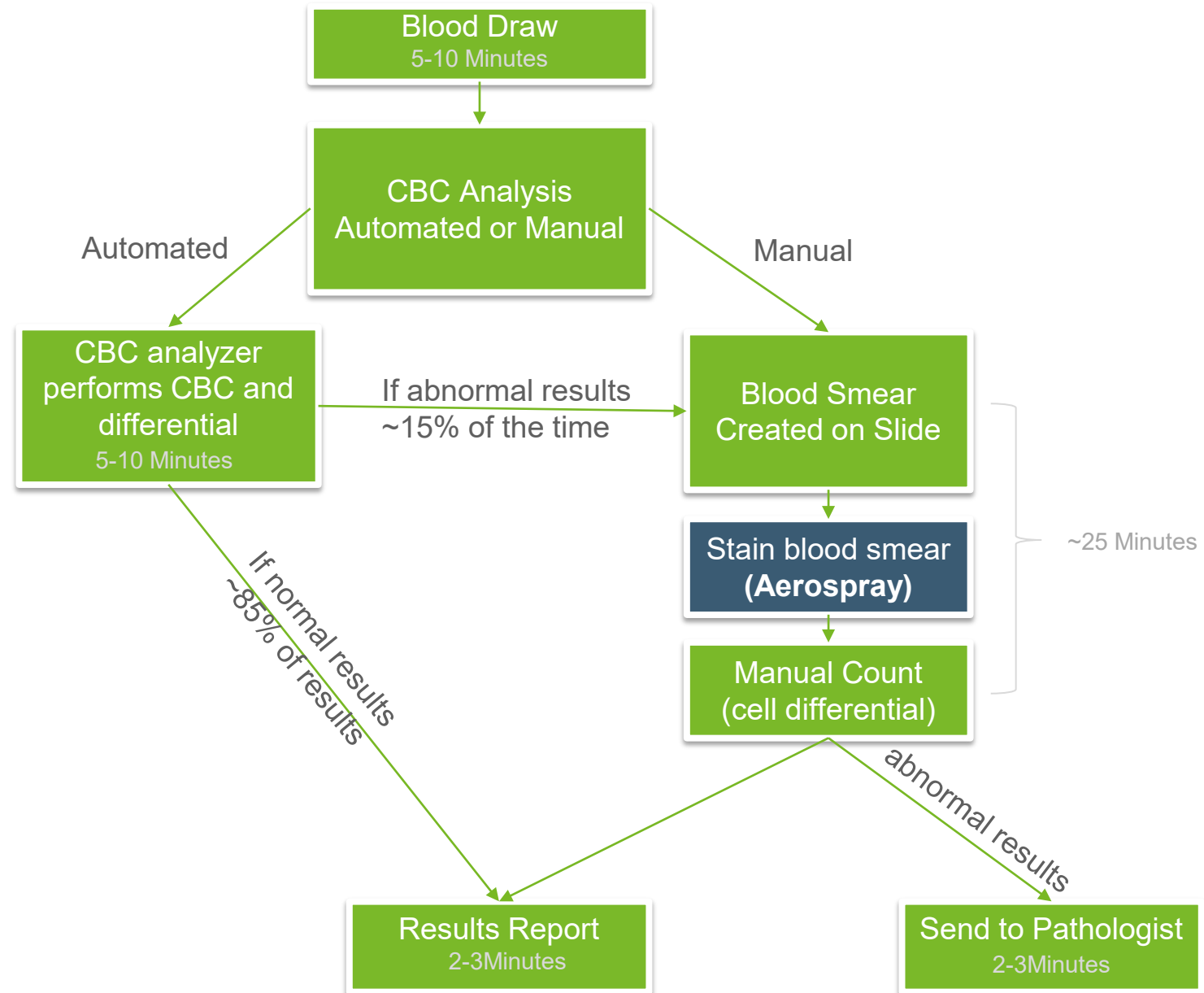
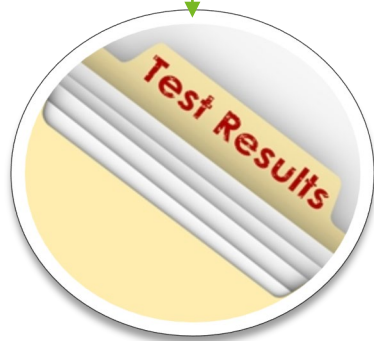
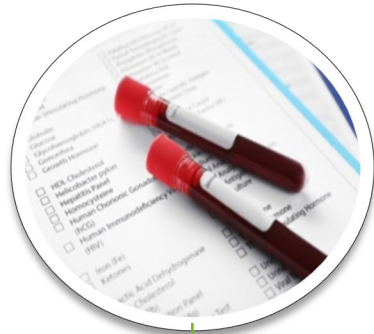
Laboratory Workflow for Manual Staining

Performing a Single Slide Differential



Slide Staining with Pro/Stat Stainer

From Blood Draw to Result



OVERVIEW

Aerospray® Technology and Hematology Pro Slide Stainer





Aerospray® Staining



● Hematology Stat

Automates the staining of blood smears and bone marrow samples to facilitate enhanced clarity and debris free slides using thiazine and eosin aqueous based staining techniques.



● Hematology Pro

Automates the staining of blood and other body fluids to facilitate enhanced clarity using a rapid stain mode, a longer Wright-Giemsa mode, a May Grünwald Giemsa (MGG) mode or custom settings.



● Gram

Automates the staining of pure strain isolate smears and human specimens with microorganisms to facilitate enhanced clarity and debris free slides using the Gram differentiation method.



● TB

Automates the staining of body fluid specimens to facilitate the detection of acid-fast bacilli including mycobacterium tuberculosis using either fluorescence or carbol fuchsin staining.



● Cytology

Automates the staining of cytology specimens to facilitate the examination of an array of cell differentiations utilizing Papanicolaou staining techniques.

CytoPro® Rotor



Automates the cyto-centrifugation of cell suspensions to facilitate the sedimentation of cells onto a slide using patented chamber designs and pad absorption method.

Aerospray® Reagents

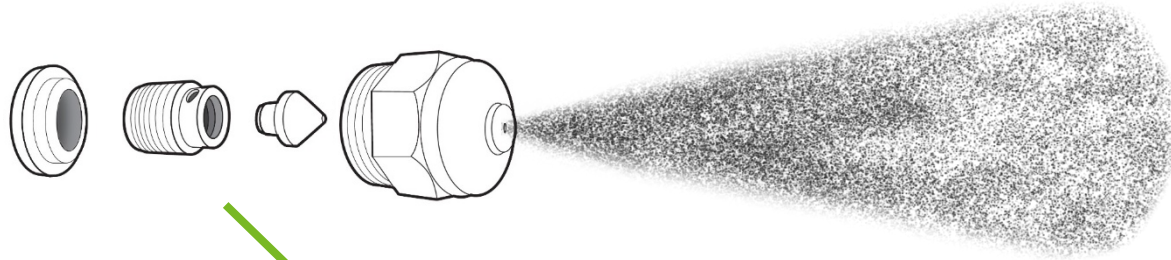
Intended for use exclusively with Aerospray® Stainers.



* 18-month shelf life

Aerospray® Staining Technology

Reagent nozzle spray application



Technology Features

1. Fresh application of stain is applied to every slide
2. Automated nozzle clean after each stain cycle

Benefits of Aerospray:

- ✓ Eliminates cross-contamination
- ✓ Saves time
- ✓ Low maintenance
- ✓ Leads to less reagent usage



Aerospray® Hematology Pro Slide Stainer/Cytocentrifuge

Superior Staining Advantages for Labs

- Eliminates cross-contamination
- Built-in sample prep with the inclusion of CytoPro® Rotor
- Traceability to reagents with barcode reader
- Reduction of labor/cost per slide
- Low maintenance
- The perfect compliment
- Rapid stain time: 3-15 minutes
- Customizable Programs

Key Features

- 12-slide & 30-slide capacity
- Easy to program functions for preferences
- Automated nozzle clean and waste detection



Sample Types

- Bone Marrow
- Body Fluids
- Cerebrospinal Fluid
- Urine
- Washes
- Blood
- Sputum
- Aspirates
- Synovial

Aerospray® Hematology Reagents

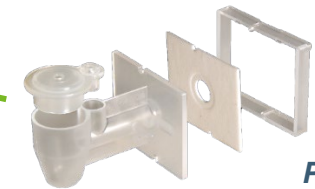
- Buffer (pH 6.8 or 7.2)
- Thiazin
- Eosin
- Aerofix

Built-in Cytocentrifugation Capabilities

CytoPro® Rotor Benefits

Sample Types

- CSF
- Sputum
- Pleural Fluid
- Peritoneal Fluid
- BAL
- Urine
- FNA
- Synovial
- Lavage
- Cultures
- etc.



Proprietary
Sample Chamber

Features

- 8 slides at a time
- Patented flow control rings
- Double and single chamber options
- Uniform smear on slides
- Highest sensitivity/reproducibility to prevent false results

Benefits

- Fast and convenient technique to transfer cells from a liquid suspension onto a microscope slide (Recommended by CLSI-H56-P guideline)
- THE ONLY dual-purpose instruments equipped with staining and cytocentrifugation capabilities
- Produces a clean monolayer sample
- Less bench space



Advantages of Aerospray® Pro Hematology Stainer



Eliminates Cross-Contamination

Fresh application of stain is applied to every slide



Standardization

Consistent, reliable, and standardized staining across multiple labs



Low-cost

Reagent level monitoring reduces consumption and **lowers costs**



Low-maintenance

Saves time and is low maintenance with automated nozzle clean after each stain cycle



Lab Compliance

Ensures lab compliance and standardization with the barcode reader



Rapid Performance

Rapid performance with a cycle times as short as 15 minutes



Perfect Complement

Easily supplemented in any workflow



Customizable

Vast array of **customizable** settings including rapid Wright Giemsa, Wright Giemsa, and May Grunwald Giemsa



Dual Purpose

Equipped with **cytacentrifugation capabilities**

Aerospray® Hematology Pro Stains

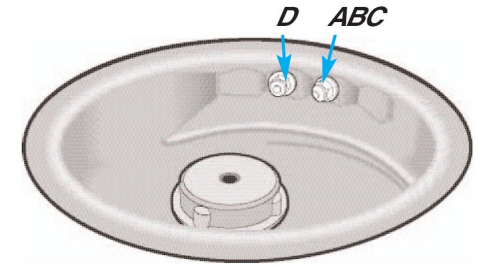


Hematology Reagent D,
Aerofix® Fixative

Hematology Pro Reagent C,
Eosin Stain

Hematology Pro Reagent B,
Thiazin Stain

Hematology Pro Reagent A,
Buffer



- Thiazin, Eosin, and Buffer are sprayed from the ABC nozzle
- Fixative (Aerofix or Methanol) is sprayed from the D nozzle

Hematology Pro Reagents



Reagent→ Packaging↓	A - Rinse	B - Thiazin	C - Eosin	D - Methanol
500 mL Prepared	NA	SS-071B‡ SS-071B-EU	SS-071C‡ SS-071C-EU	SS-MeOH*‡ or SS-048 (Aerofix®)*‡
1 Gallon (3.7 L) Prepared	SS-071A* (pH 6.8) SS-072A* (pH 7.2) SS-072A-EU** (pH 7.2)	NA	NA	NA
Concentrate	SS-171A (pH 6.8) SS-171A-EU (pH 6.8) SS-172A (pH 7.2) SS-172A-EU (pH 7.2) (30 mL dilutes to 5 L)	SS-171B2 (200 mL dilutes to 500 mL)	SS-171C2 (220 mL dilutes to 500 mL)	SS-148 SS-148-EU (Aerofix®) (135 mL dilutes to 4.6 L)

‡ Ships as hazard internationally or overnight (airfreight)

*Provided in US only

-EU designates reagents available in Europe

** Is actually 5 L ready-to-use





More on Rapid Performance

Aerospray® Hematology Pro/Stat Stainer

Slide Staining Capacity

	Per Hour	Per Day
12 Slide Carousel	144*	≈ 1,152
30 Slide Carousel (Only Pro)	360*	≈ 2,880

*Numbers vary depending on stain settings.
This is a conservative average across multiple stain settings

*Estimates

Aerospray® Hematology Stat Stains

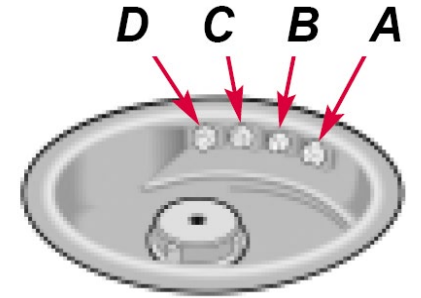


**Hematology Reagent D,
Aerofix® Fixative**

**Hematology Stat Reagent C,
Eosin Stain (water based)**

**Hematology Stat Reagent B,
Thiazin Stain (water based)**

**Hematology Stat Reagent A,
Rinse (buffered to pH 6,0)**



Standard Hematology Stat Reagents



Reagent→ Packaging↓	Pre-dip Fixative	A – Rinse	B – Thiazin	C – Eosin	D – Methanol (Necessary for clean cycles)
500 mL Prepared	SS-049P SS-049P-EU	SS-049A SS-049A-EU	SS-035/049B SS-035/049B-EU	SS-049C SS-049C-EU	NA
1 Gallon (3.7 L) Prepared	NA	NA	SS-035/049BG	NA	NA
Concentrate Surfactant (SS- 135S 15 mL)	SS-149P (15 mL – Dilutes to 500 mL)	SS-135/149A (135 mL – Dilutes to 4.6 L) and SS-135S	SS-135/149B (135 mL – Dilutes to 4.6 L) and SS-135S	SS-135/149C (135 mL – Dilutes to 4.6 L) and SS-135S	NA

‡ Ships as hazard internationally or overnight (airfreight)

*Provided in US only

-EU designates reagents available in Europe



Basofix Hematology Stat Reagents



Reagent→ Packaging↓	A – Rinse	B – Thiazin	C – Eosin	D - Methanol
500 mL Prepared	SS-035A SS-035A-EU	SS-035/049B SS-035/049-EU	SS-035C SS-035C-EU	SS-MeOH‡* or SS-048 (Aerofix®)‡*
1 Gallon (3.7 L) Prepared	SS-035AG	SS-035/049BG	SS-035CG	NA
135 mL Concentrate Dilutes to 4.6 L Surfactant (SS-135S 15 mL)	SS-135/149A and SS-135S	SS-135/149B and SS-135S	SS-135/149C and SS-135S	SS-148 (Aerofix®) SS-148-EU

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** Is actually 5 L ready-to-use

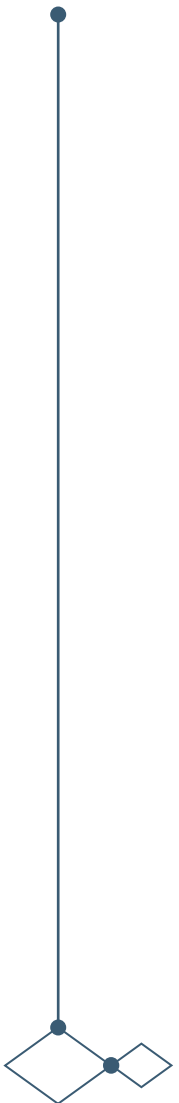
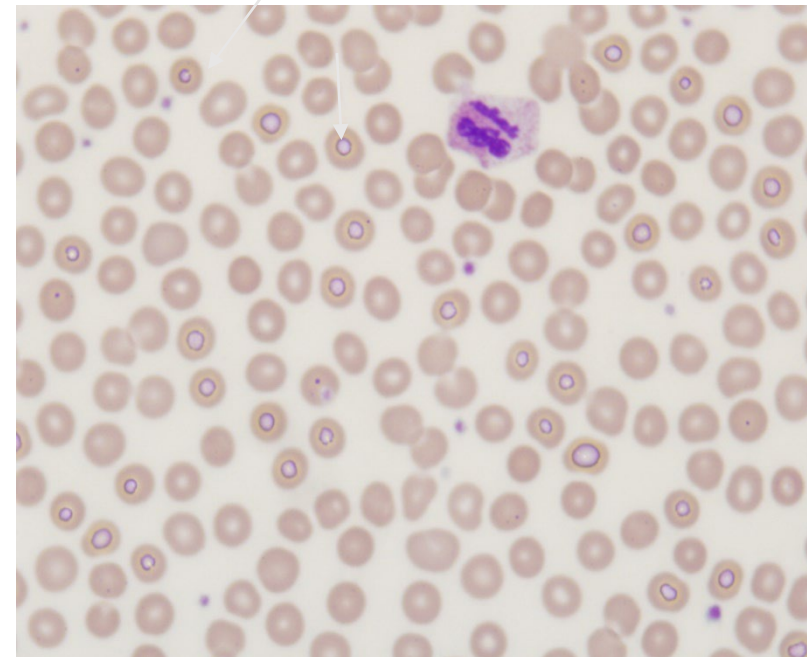


Aerofix (REF: SS-148 / SS-048)



- ◆ Use Aerofix SS-148: 15ml SS-148 + 500mL methanol
- ◆ Helps remove water droplets in RBC
- ◆ Common to Romanowsky staining in high humidity areas (default use)

Refractile Spots



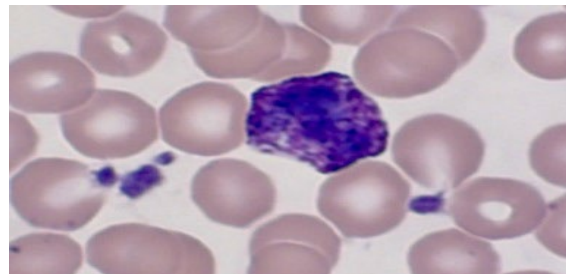
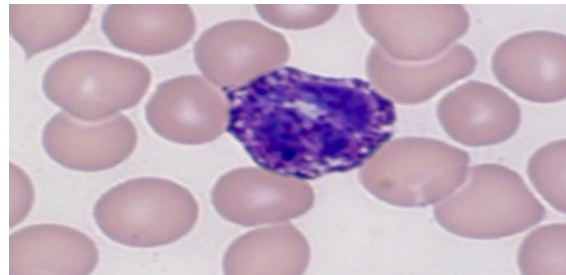
Basofix (REF: SS-149 / SS-049)

Enhanced Granulation

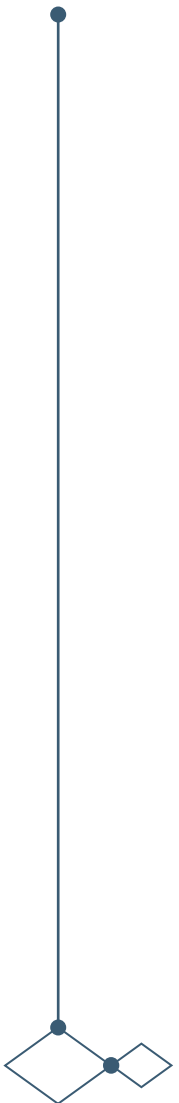
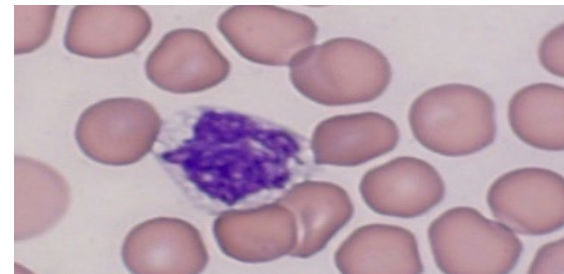
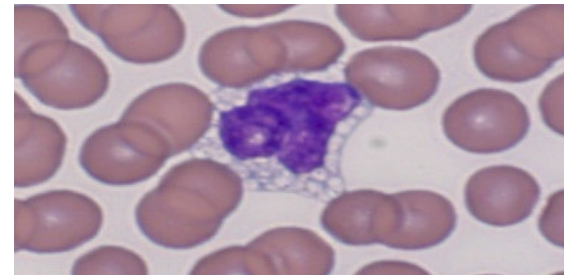


- ◆ Addition of Basofix as a pre-dip solution to enhance granulation (see appendix C in manual)

Basophils Stained on a
7122 with Basofix[®]
SS-049 Reagents



Basophils Stained on a
7122 with SS-035 Reagents

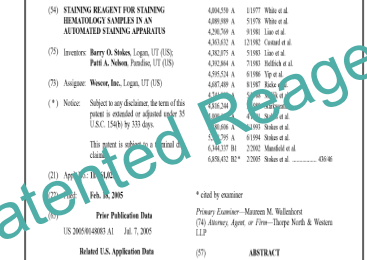
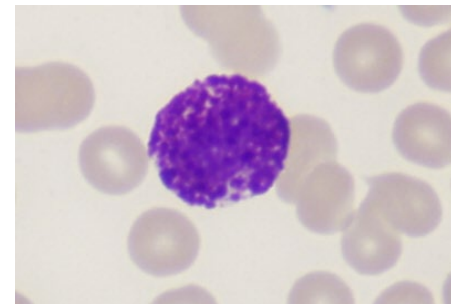


When to offer the Aerospray® Hematology Pro Slide Stainer/Cytocentrifuge:

- ◆ Higher acceptance in labs versus Hematology Stat
- ◆ Patented reagents prepared from pure components for reliable and reproducible results
- ◆ Advanced diagnosis: highly interested in morphology (3D): strong granulation, Döhle bodies, RBC pallor, strong auer rods
- ◆ Prefers flexibility:
 - Want to test blood, body fluid & bone marrow
 - Result adaptable to every need
- ◆ Accepts longer staining time/slide



Basophil Stained on Hematology Pro



United States Patent		(16) Patent No.:	US 7,303,920 B2
Stokes et al.		(63) Date of Patent:	*Dec. 4, 2007
(54) STAINING REAGENT FOR STAINING HEMATOLOGY SAMPLES IN AN AUTOMATED STAINING APPARATUS	4,982,318 A	4,107	Walt et al.
	4,889,819 A	5,179	Walt et al.
	4,262,500 A	4,191	Lehr et al.
(55) Inventors: Barry O. Stokes, Logan, UT (US); Paul A. Nelson, Parkdale, UT (US)	4,300,033 A	4,218	Conrad et al.
	4,382,875 A	5,180	Lee et al.
	4,923,884 A	5,180	Selisko et al.
(56) Applicant: Woese, Inc., Logan, UT (US)	4,952,534 A	6,108	Tye et al.
	4,672,489 A	6,107	Walt et al.
	4,741,999 A	6,107	Walt et al.
(*) Notice: Subject to any disclaimer, the terms of this patent are extended or adjusted under 35 U.S.C. 154(b) by 333 days.	4,936,200 A	6,107	Walt et al.
	4,936,201 A	6,107	Walt et al.
	4,936,202 A	6,107	Walt et al.
	4,936,203 A	6,107	Walt et al.
	4,936,204 A	6,107	Walt et al.
	4,936,205 A	6,107	Walt et al.
	4,936,206 A	6,107	Walt et al.
	4,936,207 A	6,107	Walt et al.
	4,936,208 A	6,107	Walt et al.
	4,936,209 A	6,107	Walt et al.
	4,936,210 A	6,107	Walt et al.
	4,936,211 A	6,107	Walt et al.
	4,936,212 A	6,107	Walt et al.
	4,936,213 A	6,107	Walt et al.
	4,936,214 A	6,107	Walt et al.
	4,936,215 A	6,107	Walt et al.
	4,936,216 A	6,107	Walt et al.
	4,936,217 A	6,107	Walt et al.
	4,936,218 A	6,107	Walt et al.
	4,936,219 A	6,107	Walt et al.
	4,936,220 A	6,107	Walt et al.
	4,936,221 A	6,107	Walt et al.
	4,936,222 A	6,107	Walt et al.
	4,936,223 A	6,107	Walt et al.
	4,936,224 A	6,107	Walt et al.
	4,936,225 A	6,107	Walt et al.
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When to offer the Aerospray® Hematology Stat Slide Stainer/Cytocentrifuge:



- ◆ **First, promote Hema Pro and offer Hema Stat as back-up:**
 - Customer has economical restrictions
 - Pro and Stat instruments are similar in price. The Stat reagents are less expensive because they are made with water and not methanol. Price per test is 50% less expensive with Stat stainer than Pro stainer.
 - Customer wants fast screen result (no diff automation)
 - Customers currently uses manual quick dip
 - Customer is less interested in morphology of cells
- ◆ **Not advised for staining bone marrows**
- ◆ **No ideal staining: weak granules, Döhle bodies, RBC pallor**
 - Granules for basophils do not stain. Requires some training in order to identify basophils when stained with Stat stainer.
- ◆ **Not advised for MGG users**
- ◆ **Very clean slides**

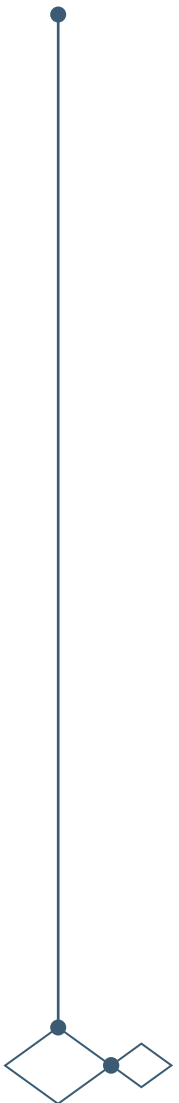


Applications for Aerospray® Hematology Pro and Stat Stainers



Application	Pro	Stat
Bone Marrow	✓ +	* ✓
Blood	✓ +	* ✓
Body Fluids	✓	✓
Veterinary	✓	✓

**May see deficiencies in primary granulation, Basofil granules are washed out.*






Competition



Aerospray® Pro Competition

High Volume Labs






	 Sysmex	 Beckman Coulter	 Horiba
Models	XN-3100 / SPI 1000i + CellaVision	DxH 900 + DxH Slidemaker Stainer II	Yumizen Slide Preparation System (SPS)
Methodology (dip stainer, centrifugal, bath, etc.)	Fully Automated with Digital Imaging	Fully Automated (Batch and Bath method)	Fully Automated (Bath)
Time to Result	200 samples / hour	100 samples / hour	120 samples / hour + time to analyze
Small/midsize/large customer	Large	Large	Large
Strengths	<ul style="list-style-type: none"> Automated rerun/reflex testing Reflexive slide preparation Optional digital cell imaging Eliminates personal variation Consistent staining environment and stain method Allows lab personal to walk away and perform other tasks 	<ul style="list-style-type: none"> 93% first-pass yield – auto verifiable results Enhanced Coulter Principle for WBC, RBC, and PLT counts Performs flow cytometry for cell subtyping Expandable modular system Adjustable and programmable slide and smear settings Eliminates personal variation Consistent staining environment and stain method Allows lab personal to walk away and perform other tasks 	<ul style="list-style-type: none"> Continuous loading Whole blood 75µl sampling Automatic maintenance Compact analyzer User and results security Standardized Quality of blood smears Turn Around Time (TAT) optimized Defined working practice Ideal match for the digital microscopic systems Continuous loading

Aerospray® Pro Competition (cont.)

High Volume Labs







	 Sysmex	 Beckman Coulter	 Horiba
Weaknesses	<ul style="list-style-type: none">• Expensive• Space availability• Repair issues / down time• Unique/dedicated reagent sets (not suitable for manual staining)• No chance to adjust or troubleshoot during stain process	<ul style="list-style-type: none">• Expensive• Space availability• Repair issues / down time• Unique/dedicated reagent sets (not suitable for manual staining)• No chance to adjust or troubleshoot during stain process	<ul style="list-style-type: none">• Expensive• Space availability• Repair issues / down time• Unique/dedicated reagent sets (not suitable for manual staining)• No chance to adjust or troubleshoot during stain process• Slides need to be moved to analyzer / microscope once completed
Key points (How Aerospray® fits in or replaces the testing done)	<ul style="list-style-type: none">• Back-up• Redundancy• Space saving• One-off & specialty staining	<ul style="list-style-type: none">• Back-up• Redundancy• Space saving• One-off & specialty staining	<ul style="list-style-type: none">• Back-up• Redundancy• Space saving• One-off & specialty staining

Aerospray® Pro Competition

Medium/Low Volume Labs







	 Sysmex	 Beckman Coulter	 Yumizen	 Hematek
Models	XN-3100 / SPI 1000i + CellaVision	DxH 690 / DxH	H2500 / H1500	3000 System
Methodology (dip stainer, centrifugal, bath, etc.)	CBC Analyzer Only, staining done offline	CBC Analyzer Only, staining done offline	CBC Analyzer Only, staining done offline	Capillary Action Staining
Time to Result	100 / 200 samples per hour + time to stain	100 samples per hour + time to stain	120 samples / hour + time to stain	up to 60 slides per hour. 6-8 minute cycles
Small/midsize/large customer	Small/Midsize	Small/Midsize	Small/Midsize	Small
Strengths	<ul style="list-style-type: none"> All clinical capabilities are standard 88uL sample size Onboard decision rules with rerun/reflex capabilities Smaller reagent packaging sizes and concentrated reagent option Optional floor stand/wagon Modular and scalable 	<ul style="list-style-type: none"> CBC analyzer Estimated 15% of results found abnormal Enhanced Coulter digital impedance 360 VCS with DataFusion Sample sizes: 165uL (whole blood and body fluids) 	<ul style="list-style-type: none"> 56 parameters with CBC/DIFF/NRBC, PLT Ox*, Retics*, Body Fluids parameters 4 sided mixing autoloader One sampling needle Low sampling volume of 110uL User friendly software I Integrated Expert validation station with middleware capabilities 	<ul style="list-style-type: none"> Continuous-feed loading platform eliminates wasted time associated with batch staining methods Semi-automated Compact All-in-one stain pack

Aerospray® Pro Competition (cont.)

Medium/Low Volume Labs








	 Sysmex	 Beckman Coulter	 Yumizen	 Hematek
Weaknesses	<ul style="list-style-type: none"> All clinical capabilities are standard 88uL sample size Onboard decision rules with rerun/reflex capabilities Smaller reagent packaging sizes and concentrated reagent option Optional floor stand/wagon Modular and scalable 	<ul style="list-style-type: none"> CBC analyzer Estimated 15% of results found abnormal Enhanced Coulter digital impedance 360 VCS with DataFusion Sample sizes: 165uL (whole blood and body fluids) 	<ul style="list-style-type: none"> 56 parameters with CBC/DIFF/NRBC, PLT Ox*, Retics*, Body Fluids parameters 4 sided mixing autoloader One sampling needle Low sampling volume of 110µL User friendly software I Integrated Expert validation station with middleware capabilities 	<ul style="list-style-type: none"> Pumps deliver a fresh, precise volume of reagent for every slide. Slides run across a platen which accumulates specimens, precipitate, stains, and scratches that affect the quality of the slides and staining After 6 months of use parts of the stainer need to be replaced or maintained. Users have to buy a kit to replace tubing inside the machine that wears out over time and may start to leak. All-in-one stain pack delivered with enough stain for up to 900 slides. 3-6 month lifespan of stain. Sold in packs, not individual reagents. Lot to lot
Key points (How Aerospray® fits in or replaces the testing done)	<ul style="list-style-type: none"> Perfect match with Aerospray® Stainer <ul style="list-style-type: none"> Eliminates cross-contamination Standardization across multiple labs High-quality control Reduction of labor/cost per slide Low maintenance Laboratory compliance 	<ul style="list-style-type: none"> Perfect match with Aerospray® Stainer <ul style="list-style-type: none"> Eliminates cross-contamination Standardization across multiple labs High-quality control Reduction of labor/cost per slide Low maintenance Laboratory compliance 	<ul style="list-style-type: none"> Perfect match with Aerospray® Stainer <ul style="list-style-type: none"> Eliminates cross-contamination Standardization across multiple labs High-quality control Reduction of labor/cost per slide Low maintenance Laboratory compliance 	<ul style="list-style-type: none"> Aerospray® uses reagents more efficiently providing for cost savings for the lab. Cross contamination is not an issue with Aerospray®. Regular maintenance is easier with the Aerospray®, replacing worn out tubes in the Hematek is difficult (they start to wear out 6-12 months of use). Hematek reagents vary from lot to lot, ELITechGroup reagents do not.

Direct Competition

Similar Through-puts



Company	 Emd Millipore Corporation	 Siemens Healthineers	 NEUTEC Group Inc.	 CellaVision	 Hardy Diagnostics
Product Name	Midas® III-Plus Automated Stainer	Hematek 3000	The Poly Stainer	RAL Stainer 555	HemaPro
Stainer Competition	GRAM / TB / Hematology	Hematology	GRAM / TB / Hematology	GRAM / TB / Hematology	Hematology
Differentiation (feature)	Dip Stainer	Platen Method Staining	Batch Dip Staining	Automated Dip Stainer	Cuvette Injection Staining
Regulatory / Regions	CE / FDA	CE / FDA	-	FDA / CE	FDA / CE
Manufactured	USA	USA	-	France	USA
Throughput	~ 40 slides / hr.	~ 60 slides / hr.	20 slides per basket	~25 slides / hr.	~40 slides / hr.
Threat	Dip Stainer	Similar Through-put	Dip Stainer	Automated	-

In-depth Top Competitor Analysis

Midas® III-Plus Automated Stainer



- **Cost:** \$16,250.00
- **Run Time:** 20-30 minute batches to have a slide ready for the microscope
- **Maintenance and Repairs:**
 - Daily- Clean Surfaces
 - Weekly- Remove and clean reagent containers
 - Monthly- Check electrical connection at rear panel of system
 - Service contract recommended after warranty expires
- **Cross-Contamination:**
 - Utilizes the dip slide staining technique which is traditionally the most stain-wasteful staining method and prone to cross contamination (precipitate)
- **Reagent Use and Lifespan:**
 - Requires regular replacement of reagent to combat cross contamination
 - Lifespan of 3-6 months
 - Not committed to one company's reagents, leading to inconsistency and variation in staining
- **Quality Control:**
 - Daily and weekly checks using quality control slides
 - Human verification and validation

In-depth Top Competitor Analysis

Hematek™ 3000 System



- **Cost:** \$20,200.00
- **Run Time:** 6-8 minutes to have a slide ready for the microscope
- **Maintenance and Repairs:**
 - Small system with minimal maintenance
 - Breakdowns are difficult to fix, and have to buy full kits to do so
 - Requires regular Change Kit every few months (including changing the tubing)
- **Cross-Contamination:**
 - Slides run across a platen which accumulates specimens, precipitate, stains, and scratches that affect the quality of the slides and staining
- **Reagent Use and Lifespan:**
 - Stain pack have enough reagent for up to 900 slides
 - Lifespan of 3-6 months onboard stability after opened
 - Sold in packs, not individual reagents
 - Not all stain is used at the same rate, but packs have to be replaced all at once, resulting in wasted stain
- **Quality Control:**
 - Daily and weekly checks using quality control slides
 - Human verification and validation



CBC Analyzers in the Lab

In-depth CBC Analyzer

XN-3100 / SPI 1000i + CellaVision



- **Cost:** ~\$422,000.00*
- **Run Time:**
 - up to 200 samples/h in whole blood (WB) mode
 - up to 40 samples/h in body fluid (BF) mode per module
 - up to 30 slides/h in standard mode
 - up to 75 slides/h with the optional high-throughput license
- **Maintenance and Repairs:**
 - Sysmex offers 2 options of preventative maintenance in the pricelist
 - Traditional PM's - 2 On-Site Preventative Maintenance visits per contract year
 - Remote Calibration - This option reduces the annual service price and requires (no cost) connection to your Sysmex Network Communication System (SNCS). 1 On-Site PM visit and 1 Remote Calibration per contract year.
- **Cross-Contamination:**
 - Dip staining technique where baths of stain are used. Chance of cells falling off slide into bath, contaminating bath and future slides. Dip stain is traditionally the most stain-wasteful staining method and prone to cross contamination (precipitate)



In-depth CBC Analyzer

XN-3100 / SPI 1000i + CellaVision



- **Reagent Use and Lifespan:**
 - All XN analyzers have the option of the concentrated reagent system. RU-20 and CELLPACK DST minimize reagent changes. Reagent consumption varies with instrument usage.
 - 3-6 month lifespan of stain
- **Quality Control:**
 - XN-L BEYONDCARE QUALITY MONITOR PROGRAM
 - BCQM is a web-based quality control and calibration management program that includes “Basic Annual Quality Control Material” in a quantity commensurate with the number of applicable units of Equipment. Additional quality control materials, excluding quality control used for troubleshooting performed, may be available at an additional cost to Customer.



In-depth CBC Analyzer

DxH 900 + DxH Slidemaker Stainer II

- **Cost:** ~192,000.00*
- **Run Time:**
 - 300 Maximum CBCs per hour / 300 Maximum CBCs and differentials per hour
 - 140 CBC Slides per hour
- **Maintenance and Repairs:**
 - Each module has its own onboard and manual maintenance needs.
 - Daily, weekly, and 6 month cleaning is recommended for all aspects of the instrument(s).
 - 1 pre-loaded reagent cube with up to 30 cleaning cycles for cleaning/maintenance. 30 minutes daily required for maintenance and/or as needed
- **Cross-Contamination:**
 - Dip staining technique where baths of stain are used. Chance of cells falling off slide into bath, contaminating bath and future slides. Dip stain is traditionally the most stain-wasteful staining method and prone to cross contamination (precipitate)



In-depth CBC Analyzer

DxH 900 + DxH Slidemaker Stainer II



- **Reagent Use and Lifespan:**
 - 3-6 month lifespan of stain
 - Reagents mixed onboard with diluent containers and concentrates
 - Reagent consumption varies with instrument usage
- **Quality Control:**
 - Daily Checks automatically starts a series of quality control checks that will determine if the SPM is running properly, such as Background Counts. You can review the results of the Daily Checks on the System Manager
 - Timely Quality Control monitoring includes Intelligent Quality monitoring (IQM), which monitors event notification and recovery within the system on an on-going basis. IQM monitors sensor and hardware status in real-time, and also provides tracking and trending of event notifications via the Alert Status icons, alarms and in the onboard software

Aerospray® Hematology Pro and Stat



PRICE

HIGH



High Automated Staining



Beckman Coulter DxH



Horiba Yumizen
\$100,000+



Sysmex XN

Semi-Automated Staining



RAL Stainer



Siemens Hematek 3000 Plus
~\$18,000



Midas III-



Neutec Group Poly Stainer
~\$12,500



RAL StainBox



QuickSlide HemaPRO
~\$8,000 - \$11,000



Dagatron AT-2000H

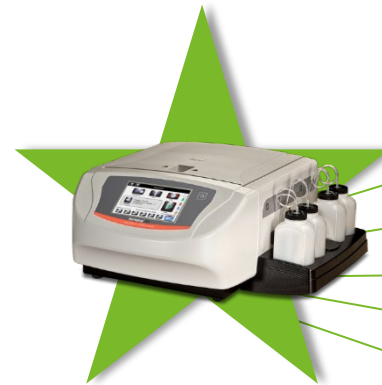


Vector Nate VM100



Thermo Fisher Linistat
~\$6,000

Hand Staining



Aerospray® Pro/Stat Stainer

- ◆ No cross-contamination
- ◆ Small Footprint
- ◆ Rapid Staining
- ◆ Dual-purpose
- ◆ \$\$\$ Cost Savings

LOW



FEATURES

WEAK

MEDIUM

STRONG

Value Selling With The Aerospray® Pro Stainer



Agenda



- ◆ **Target Market**
- ◆ **Decision-makers within the Lab**
- ◆ **Our customer types and their solutions:**
 - ◆ High volume labs and their needs
 - ◆ Low volume labs and their needs
 - ◆ Problem Questions and Implications

Target Market

Aerospray® Hematology Pro Stainer



Sales Approaches

- ◆ Emergency labs that need fast result (night shift)
- ◆ Pathology labs
- ◆ Medium/smaller labs that don't have automated TBC
- ◆ Veterinary labs
- ◆ Research labs
- ◆ Replacement strategy for Hematek users

Decision Makers

Aerospray® Hematology Pro Stainer



End Users

- ◆ Medical Technologist
- ◆ Cytogeneticist (CG)
- ◆ Cytotechnologist (CT)
- ◆ General Lab Technicians



Influencers

- ◆ Medical Laboratory Scientist
- ◆ Medical Technologist
- ◆ Hematopathologists
- ◆ Clinical Laboratory Scientist
- ◆ Pathologist
- ◆ Purchasing/Supply Chain



Decision Makers

- ◆ Laboratory Director
- ◆ Senior Pathologist
- ◆ Technical and General Supervisors
- ◆ Purchasing/Supply Chain

Sales Strategy

Aerospray® Cytology Stainer



End Users
(Influencers)

+

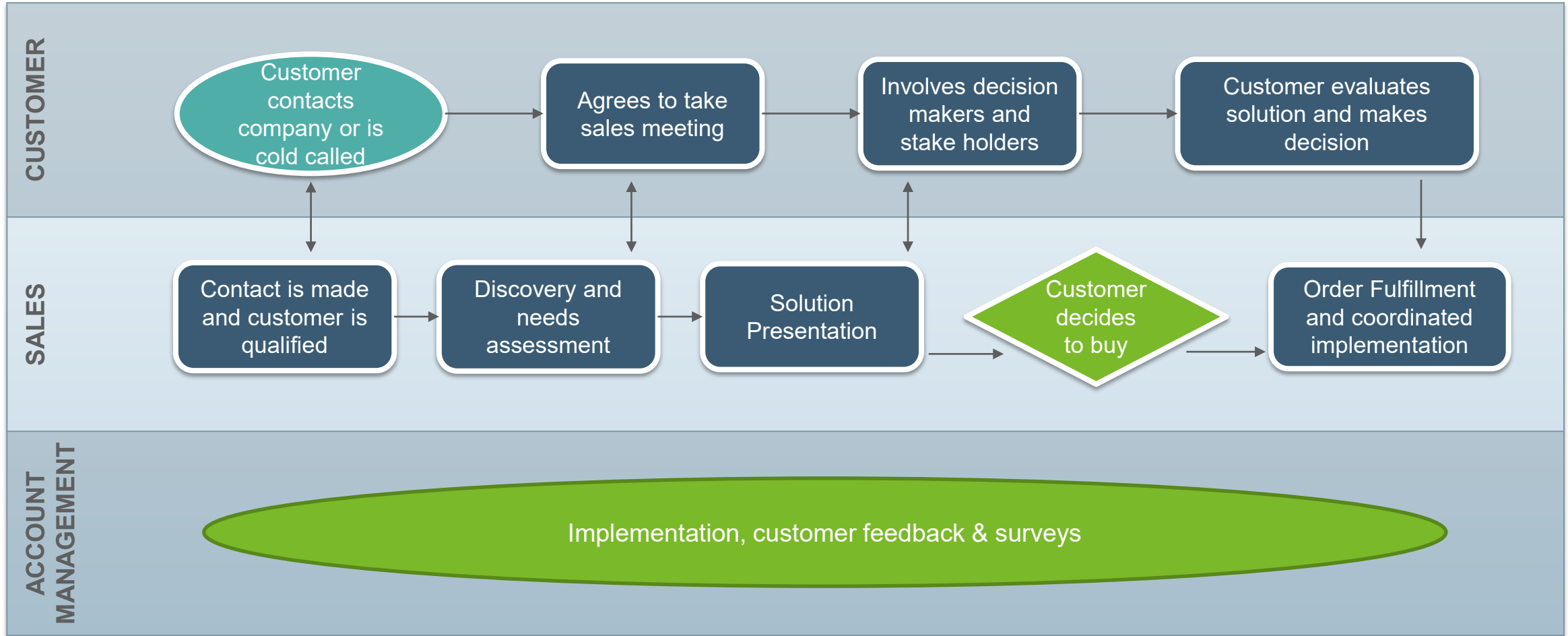
Decision Makers

=

Sales



Customer / Sales Process Map



Sales Process



Idle

- Customer that has been identified but not contacted, or customer contacted that has chosen not to go with our offering

Interest

- Rep has started the process of building the relationship with the customer and asking them questions to assess interest and pain points

Qualify

- Customer has expressed interest in one or more of our products and ready to get more information

Demo

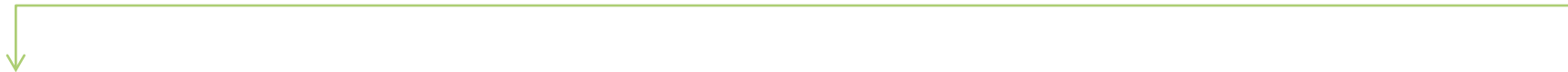
- Customer has received a live demo to show features and benefits of instrumentation

Offer

- Customer has been handed pricing negotiations are in motion or have concluded and best pricing options have been presented

Close

- Signed agreement and PO received from Customer for the purchase of an instrument



Sales Methodology (**SPIN** selling & Solution selling)



S

Situation Questions

Help you understand the current situation of the prospect's day-to-day job, project, etc.

P

Problem Questions

Designed to understand the problems your prospect is facing and their true motivations for solving them.

I

Implication Questions

Gets the prospect thinking about the consequences of not taking action to address those problems.

N

Need-Payoff Questions

Gets the prospect thinking about how solving the problem would change their situation for the

- ◆ **Educate:** Provide insights on how their business will benefit from your product. Use statistics, case studies and client results to outline how your solution will solve their biggest problems.
- ◆ **Solve:** Show them exactly how your solution will solve the problems they outlined in step two above. Use the same language and framing as the prospect.

Scenario #1: Customer Does Hand Staining



Situation

- Lab Size: 10-25 Hematology Slides a day, 3 Employees
- Using multiple coplin jars
- Have to wait for a tech
- Can only stain around 3-5 slides
- Unknown actual process time
- Unspecified inconsistencies
- Customer's perception is that hand staining is easier and faster



Solution / Aerospray Benefits

- Significant TAT improvement
- Up to 24 slides can be run at once
- A med tech is not necessary to load stainer
- No need to handle reagents
- Easy clean-up and waste removal



Competition

- EMD MILLIPORE CORPORATION
- Midas® III
- Hand Staining (Cost \$\$)

Problems and Implications

Hand Staining



Problems	Questions	Implications of not solving the problem.	Implication Questions
Manual Staining is slow	<ul style="list-style-type: none"> • What's is your staining process today? • If you could make changes to you staining process, what changes would you make? • Do your pathologist ever complain about TAT of staining a slide? 	You're TAT is always slow	<ul style="list-style-type: none"> • If we could reduce TAT on your hematology slides where could you allocate that time? • How do you handle STAT requests?
We are unable to perform manual stains when xxxx tech is out	<ul style="list-style-type: none"> • What do you do when xxxx tech is on vacation? 	You can't do any staining and patients don't get their results	<ul style="list-style-type: none"> • If anyone can load and stain the slide, how does that help the lab?
We use Coplin jars for the staining	<ul style="list-style-type: none"> • Do you put your coplin jars in a hood ? What's your setup for bloods? 	You have to run maintenance on the coplin jars	<ul style="list-style-type: none"> • How would automation help you save time with your current workflow?
There is no QC on reagents for manual staining	<ul style="list-style-type: none"> • How can you be confident that the result when there's QC? 	You get inconsistent quality on your slide stains	<ul style="list-style-type: none"> • Do you see value in getting more of a consistent quality stain? • What happens when you see problems with consistency on staining?
Low throughput staining	<ul style="list-style-type: none"> • What's your volume? • How many slides can you run? • What happens if there's another request for a slide stain? • How does the through put effect the Diff reading? 	You will constantly have bottlenecks	<ul style="list-style-type: none"> • Do the bottlenecks you see with staining ever have an impact on time to result in the lab?



Problems and Implications (Cont.)

Hand Staining



Problems	Questions	Implications of not solving the problem.	Implication Questions
No control over how much stain is absorbed by the cell	<ul style="list-style-type: none"> How do you check to see that you are getting proper coverage on your smear? Can this sometimes cause inconsistencies in staining? 	You will continue to have to monitor how you stain and keep a timer by your set up Inconsistent stain	<ul style="list-style-type: none"> Tell me about a time you saw an inconsistencies with your staining. If you could automate the staining process with a more consistent staining, how do you think that could effect the results you see?
One pathologist likes the slides one way and the other prefers the other	How do you regulate which pathologist gets which slide?	You will always have to run slides differently in a manual setup	What if you could have a program for each pathologist?
If the specimen is too thick, as it is with many body fluids, we have to redo the slide	What happens with bone marrows?	You will always have to re-stain the slides or use a different method	How useful would it be to have a ability to stain all different types of samples with one instrument?
Change reagent every week regardless of whether the reagent is finished (MIDAS)	<ul style="list-style-type: none"> What's the process that you go through when you change out the reagents and how often do you change it? When do you change your reagents? What is the cost of doing this? 	Increase your over all cost with reagents due to wasted reagent	<ul style="list-style-type: none"> What would be the impact to the lab if you didn't have to change the reagent until they were actually finished? How do you think the lab would benefit if we can decrease your reagent cost?
We need more bench space	How much bench space does your WG stain set up take?	That will always be a dedicated stain space	What could you do with the extra bench space?
We only stain 10 slides per day so don't have enough throughput to buy your stainer	How long does it take you to stain 10 slides per day? (go back to the manual process questions)	You will have difficulty having to stain more than 10 slides per day	What if your workload increases? With time so strapped, do you think automating this process would be a benefit to the techs?
We stain our body fluids in a different area with a separate centrifuge/so we have 2 instruments to take care of (centrifuge and stainer or manual set up)	How does having two setups effect your workflow?	You maintain two setups. Have to go to two different areas to get one result out	How would your workflow change if you could spin the body fluids and immediately stain on the same instrument?

Scenario #2: Customer is satisfied with their current semi-automated stainer.



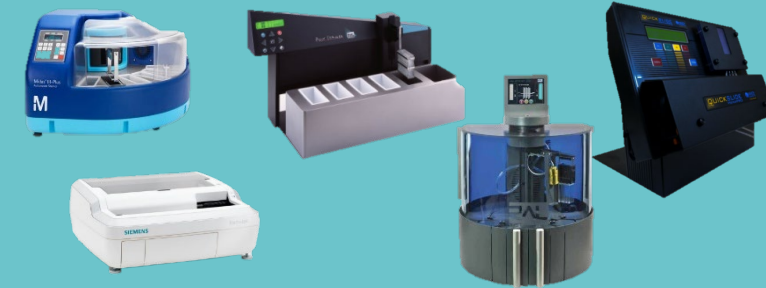
Situation

- Lab Size: 400 Slides a day, 9 Employees
- Currently run diff quicks or WG on an automated stainer
- Typically an automated stainer can be in histology or another area of the laboratory
- Customer is fine with their current stainer



Solution / Aerospray Benefits

- Decrease in TAT
- Aerospray Pro Stainer can be in Hematology
- Can run multiple slides when you need, no need to wait for the current stainer to be free
- Custom stains for laboratory preferences



Competition

- HemaPro
- RAL Stainer 555
- The Poly Stainer
- Hematek 3000
- Midas® III-Plus Automated Stainer

Problems and Implications

Semi-Automated Stainer



Problems	Questions	Implications of not solving the problem.	Implication Questions
It is difficult to control the amount of stain on a slide	<ul style="list-style-type: none"> How do you control the ratio of red to blue on each slide? 	You will always have trouble controlling the ratio of red/blue	<ul style="list-style-type: none"> How would your lab be impacted if you had better control over the ratio of red/blue?
We have to change the Hematek tubing	<ul style="list-style-type: none"> How do you maintain the stainer tubing? What is the cost of the tubing/assembly for the Hematek? 	The tubing is something you will always have to maintain/pay for	<ul style="list-style-type: none"> What would you do with the time/money you save on changing the tubing?
We can only stain up to 60 slides per hour/we get 1 slide every minute	<ul style="list-style-type: none"> Where is the bottleneck in the laboratory? 	You will always only be able to stain 60 slides per hour/1 slide/minute	<ul style="list-style-type: none"> What happens when the work load increases?
The stainer we run Diff Quicks on is in histology	<ul style="list-style-type: none"> Where do you have to go to run Diff Quicks? 	You will always have to run to histology to run your diff quicks	<ul style="list-style-type: none"> How would your workflow change if you had your own stainer?
We have to wait for the histology stainer to complete its run	<ul style="list-style-type: none"> How does it affect your workflow to have to wait for the histology stainer to finish? 	You will always have to wait to run your smears for the histology stainer	<ul style="list-style-type: none"> What if you could run your smears here, how would that impact your workflow?
We can only modify the times in the actual stain pots	<ul style="list-style-type: none"> How do you adjust your protocols to adjust colors during staining? 	The only way to adjust your stains is by time in the pots	<ul style="list-style-type: none"> What if you could have more control over colors leading to better cellular detail, how will that help the lab?



Scenario #3: Customer has a fully automated system.



Situation

- Lab Size: 3000+ Hematology Slides a day, 100 Employees
- The laboratory currently has a fully automated hematology system
- Staining is a module included in the analyzer



Solution / Aerospray Benefits

- The fully automated system needs routine maintenance and fails often enough
- Redundant stainer for these types of labs
- Can be placed for stat staining
- Useful for special samples like bone marrow or body fluids



Competition

- DxH 900 + DxH Slidemaker Stainer II
- XN-3100 / SPI 1000i + CellaVision

Problems and Implications

Fully-Automated Stainer



Problems	Questions	Implications of not solving the problem.	Implication Questions
We cannot stain when the instrument is down	<ul style="list-style-type: none"> How do you stain when the instrument is down? 	You will never be able to or have to hand stain when the instrument is down	<ul style="list-style-type: none"> How do you stain when your instrument is down?
The MTBF is often, we cannot stain	<ul style="list-style-type: none"> What do you do to stain when the instrument is down for service? 	You will always be capacitated during down time	<ul style="list-style-type: none"> What do you do when the instrument is down for maintenance?
Our body fluids sometimes do not stain properly from our current in line stainer	<ul style="list-style-type: none"> What do you do when the body fluids stain improperly on the current stainer? 	Body fluids will always be inconsistent	<ul style="list-style-type: none"> What if you had a solution to stain body fluids consistently, how would that impact your laboratory?



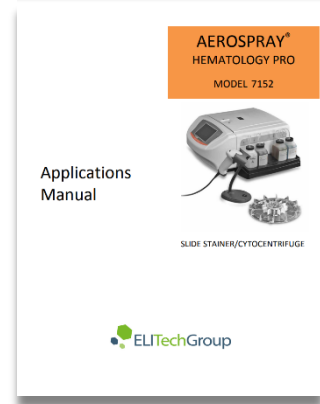


Pricing

U.S. Customer Order Components

Aerospray® Hematology Pro Stainer

1. **Aerospray® Hematology Pro** - \$15,790
2. **Cytopro® Rotor**
3. **Documentation and Manual**
4. **Two Full Sets of Reagents**
 - First Set for Installation
 - Second for Running Slides
5. **Slide Carousels (3 Options)**
6. **Waste Collection System**
7. **Nozzle Cleaning Kit**
8. **Power Cords (not pictured)**
9. **Optional Supplies**
 - Barcode Scanner - \$535



E N D.

Aerospray® Hematology Pro Slide Stainer/Cytocentrifuge

Product and Sales Training, February 2022
Prepared by: EBS Sales & Marketing

