XT-1800iV 動物用五分類血球分析儀

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SANTUNG

XT-V 規格

- 自動分析選擇之動物物種
  - Available animals: rat, mouse, dog, monkey, rabbit,cat ,horse ,guinea pig
- 微量血模式亦提供 白血球 5 分類報告
- 白血球分類的手動分析 (BALF, Ascites fluid (腹水), pleural fluid (胸水)
  - Profile之製作無上限
- Online QC功能 / 報告輸出至Host功能
- 符合FDA 21 CFR Part 11規範的權限管理軟體(選購)
- 報告之Excel轉檔功能(CSV format)
- 含圖形之報告儲存量爲 3000 筆
- Throughput: 80 samples/h

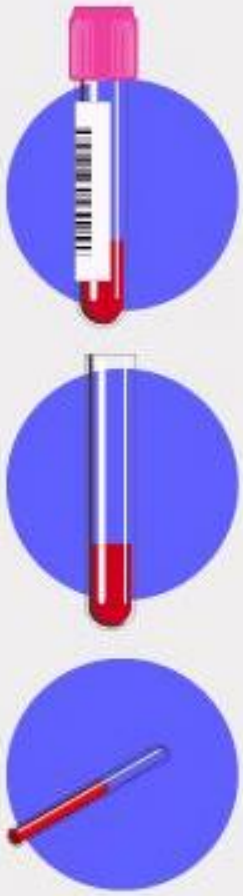
User Friendly Operation

操作方便 -- 低檢體量

自動穿刺

開蓋分析

微量血模式



Sample Aspiration Volume

CP Sampler Mode
CP Manual Mode

150μL

Manual Mode

85μL

Capillary Mode

40μL

分析項目

- 24個分析項目

C: WBC,RBC,HGB,HCT,MCV,MCH,MCHC,PLT

RDW-SD,RDW-CV,MPV, PCT, PDW, P-LCR

D: NEUT%,LYMPH%,MONO%,EO%,BASO%

NEUT#,LYMPH#,MONO#,EO#,BASO#

試薬

分析CBC

Sulfolyser

STO
FB

Cellpack

共用

分析DC

STO
4DL

(STO-4DS)

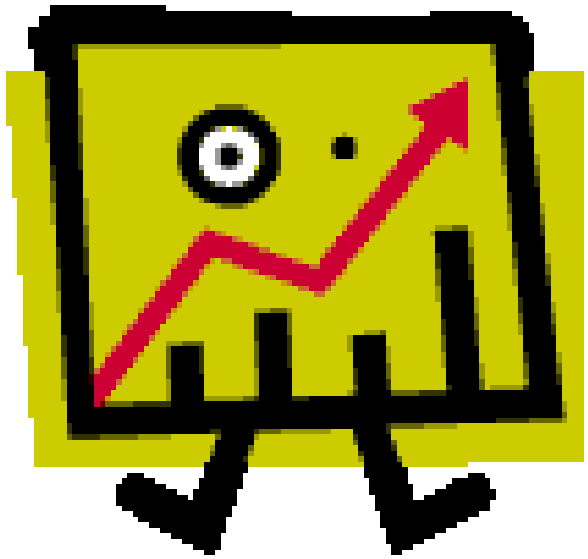
包装容量
中桶　10L
小桶　5L
小包　42mL

試藥保存

試藥	縮寫	開瓶後保存期限	未開瓶保存期限
CELLPACK	EPK	60天	至包裝上之製造日期後18個月
STROMATOLYSER-FB	FBA	60天	至包裝上之製造日期後12個月
STROMATOLYSER-4DL	FFD	60天	至包裝上之製造日期後12個月
STROMATOLYSER-4DS	FFS	60天	至包裝上之製造日期後12個月
SULFOLYSER	SLS	60天	至包裝上之製造日期後12個月

分析項目選擇

- CBC
- CBC+DC



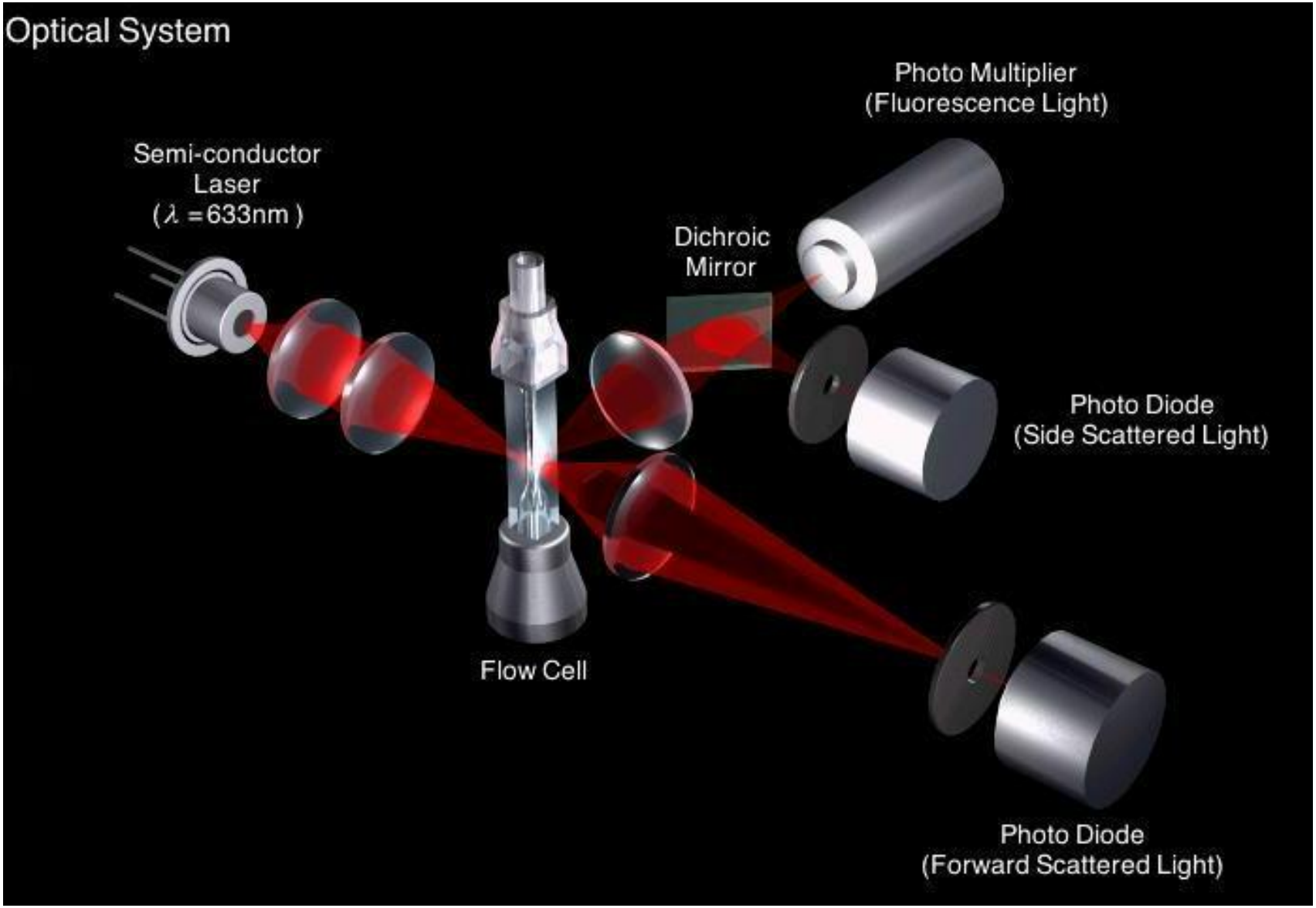
原理

Parameters	Channel/Detector	Principle
WBC, BASO	WBC/Baso	NEW! FlowCytometry using Semiconductor laser w/wo Fluorescence
NEUT&BASO, LYMPH, MONO, EO	DIFF	
RBC, HCT, MCV, PLT	RBC/PLT	阻抗+動力聚焦
HGB	HGB	SLS-Hb

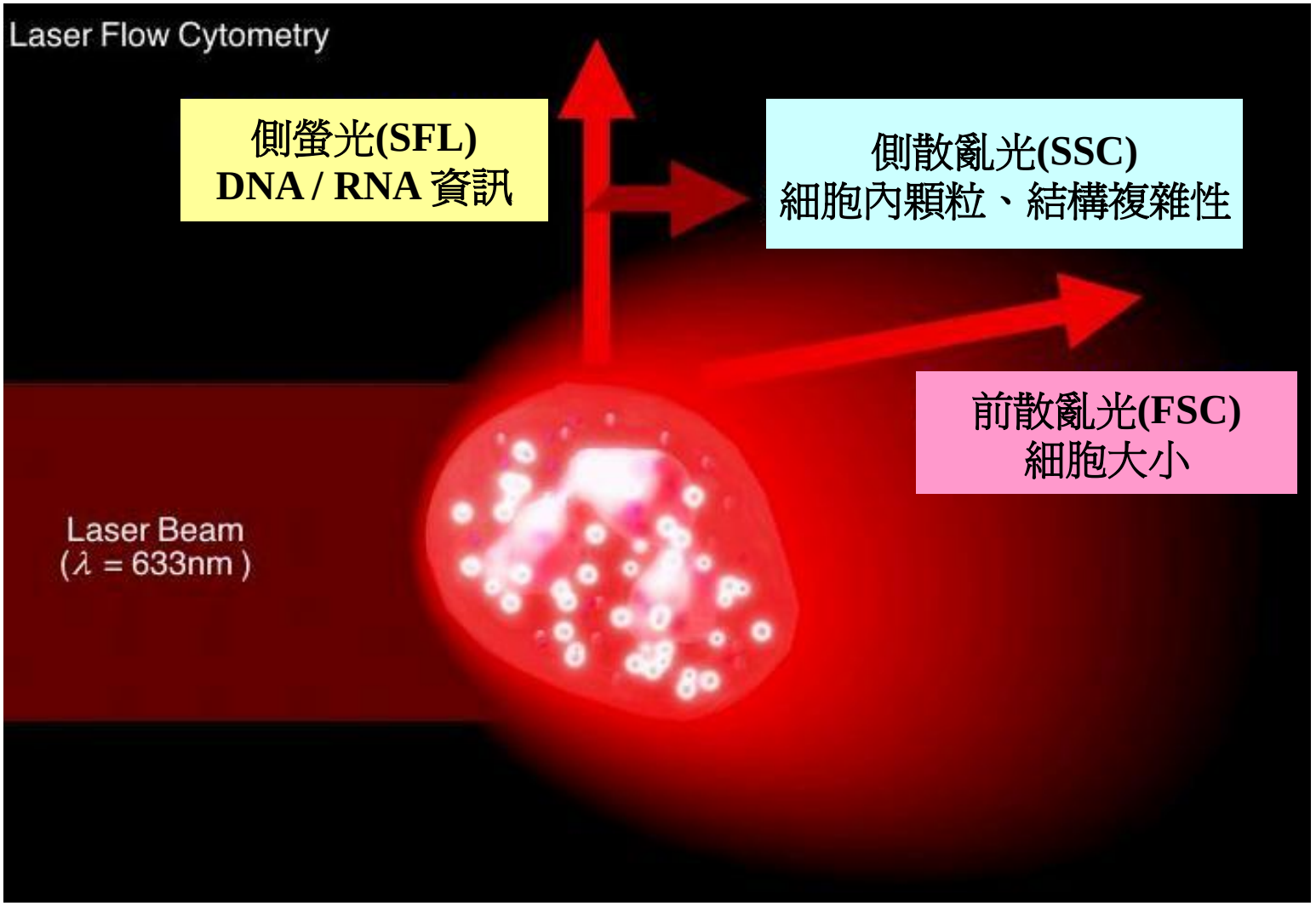
原理-WBC/Baso & DIFF

Parameters	Channel/Detector	Principle
WBC, BASO	WBC/Baso	NEW! FlowCytometry using Semiconductor laser w/wo Fluorescence
NEUT&BASO, LYMPH, MONO, EO	DIFF	
RBC, HCT, MCV, PLT	RBC/PLT	阻抗+動力聚焦
HGB	HGB	SLS-Hb

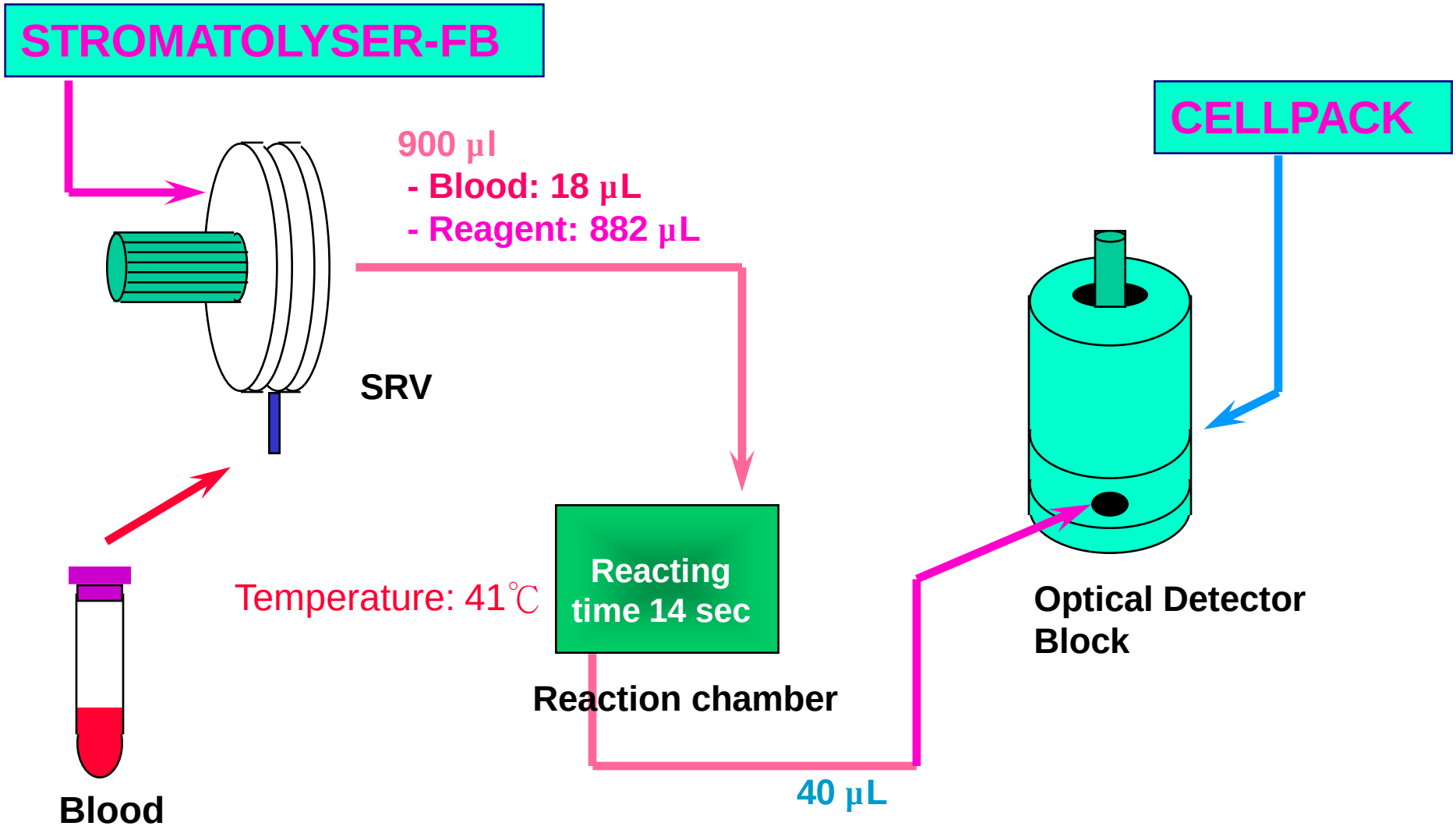
光源結構


Optical System
Photo Multiplier
(Fluorescence Light)
Semi-conductor
Laser
(λ =633nm)
Dichroic
Mirror
Photo Diode
(Side Scattered Light)
Flow Cell
Photo Diode
(Forward Scattered Light)

偵測的參數

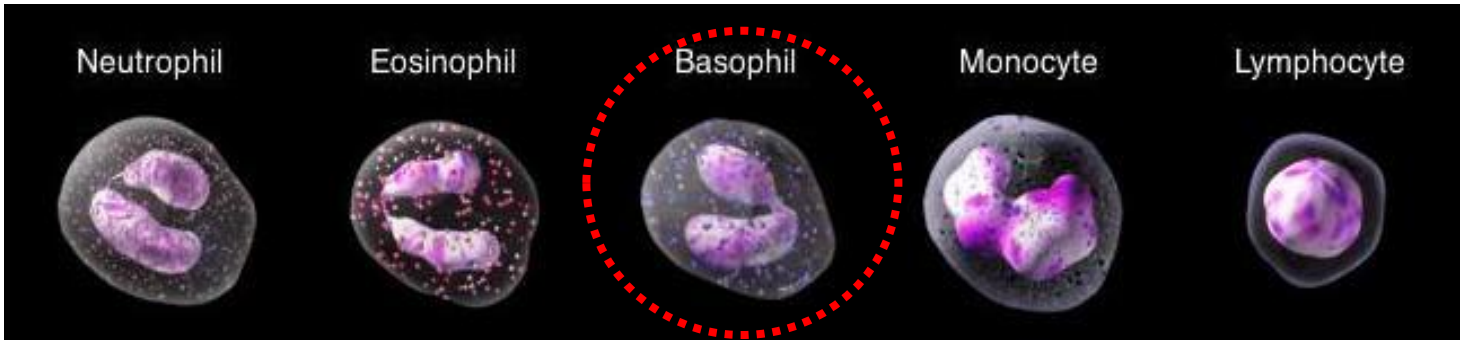

Laser Flow Cytometry
側螢光(SFL)
DNA / RNA 資訊
側散亂光(SSC)
細胞內顆粒、結構複雜性
前散亂光(FSC)
細胞大小
Laser Beam
(λ = 633nm)

WBC/Baso 的分析流程

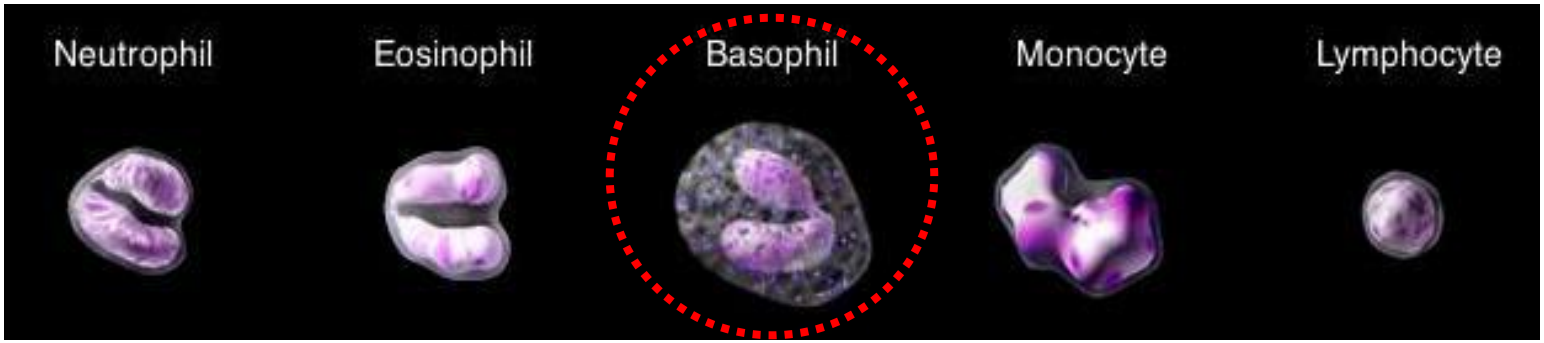


WBC/Baso 的試藥反應

反應前

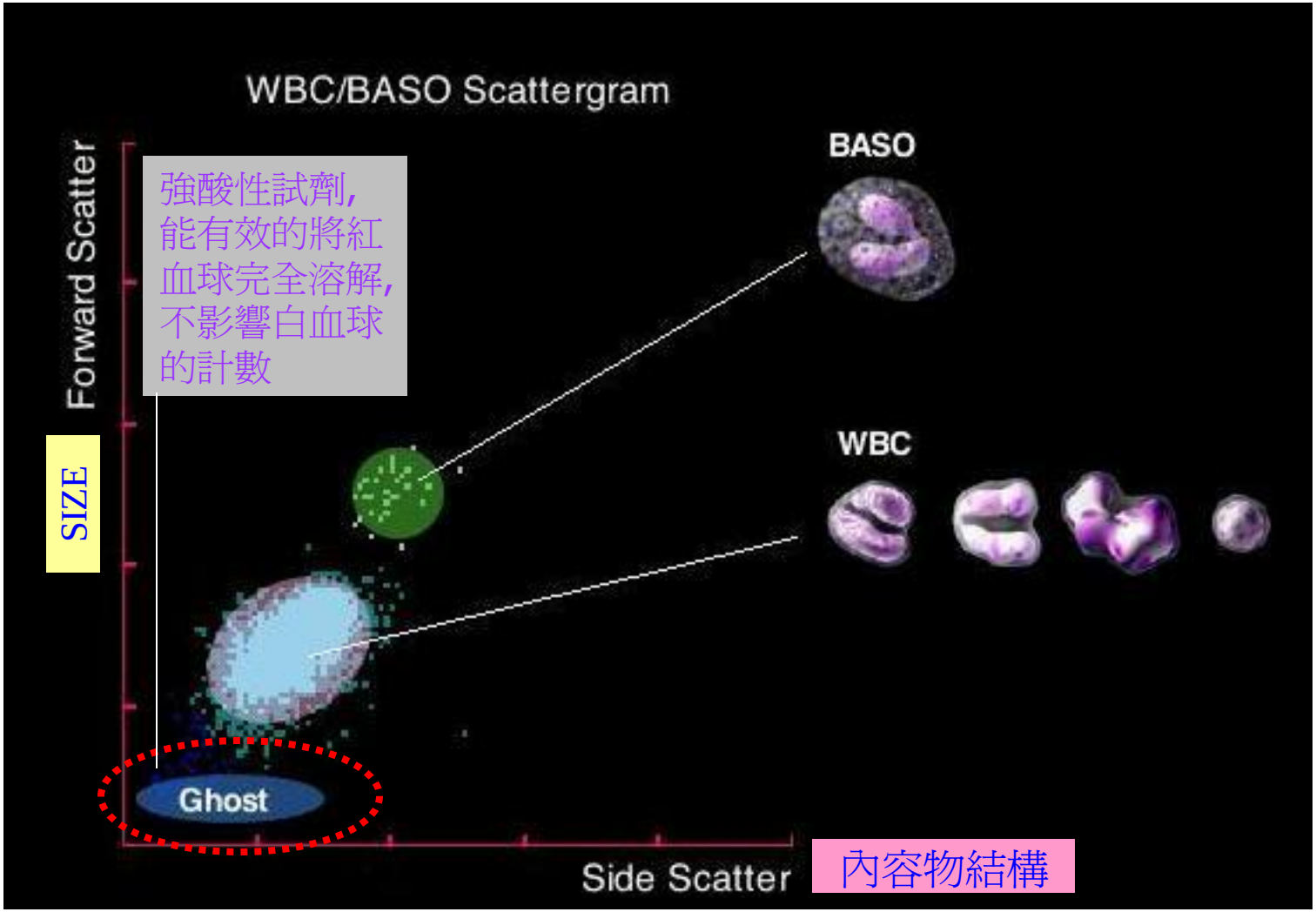


反應後

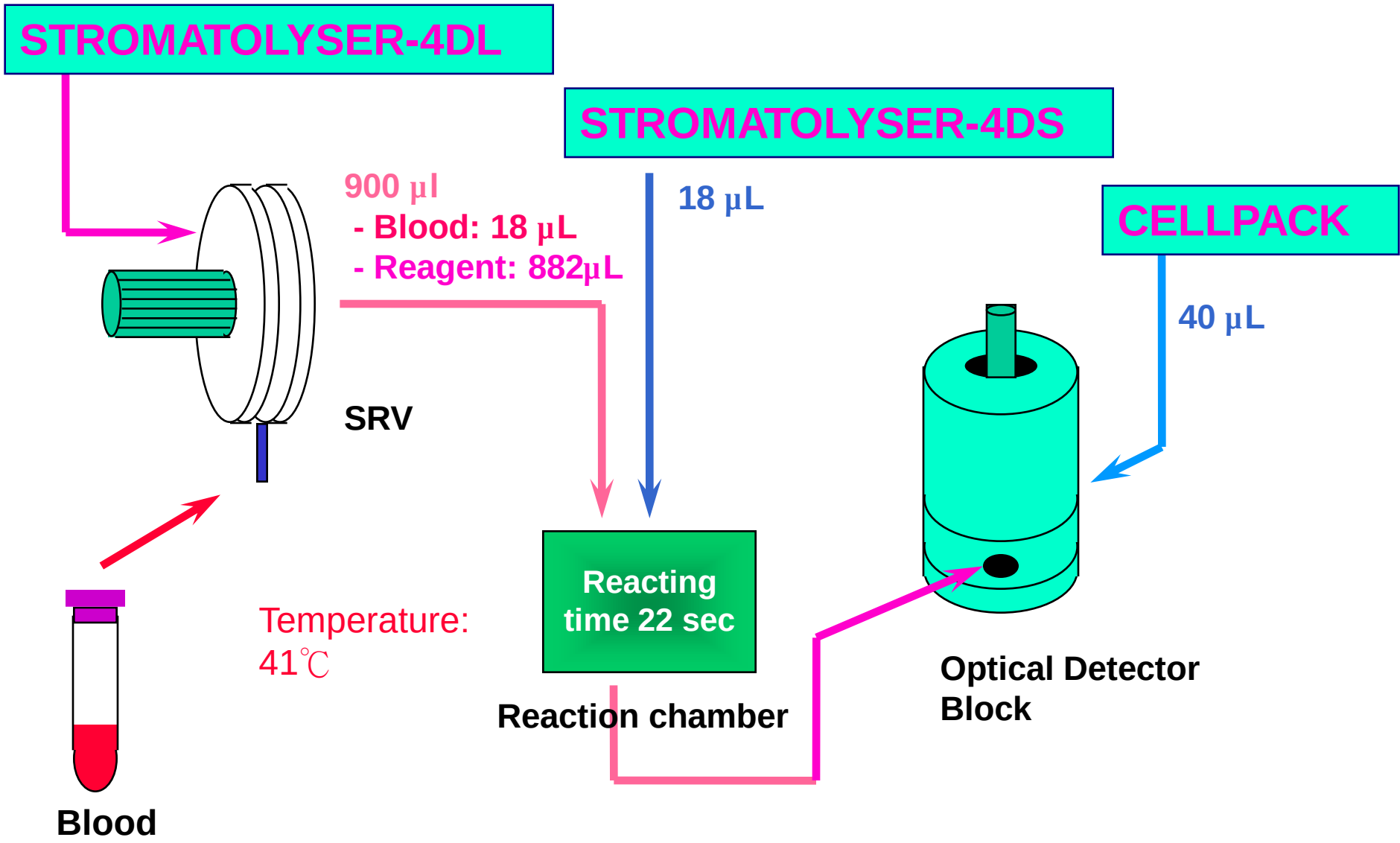


利用較強酸性試劑將Basophil維持原來形態大小,
其餘WBC則皺縮並釋出細胞質內容物。

WBC/Baso Scattergram

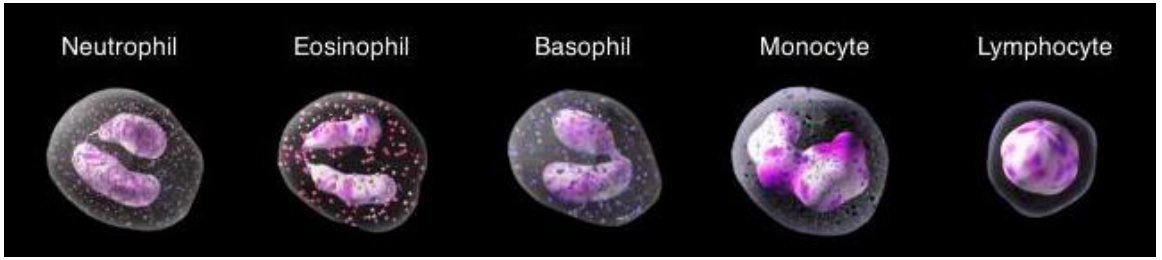


DIFF 的分析流程

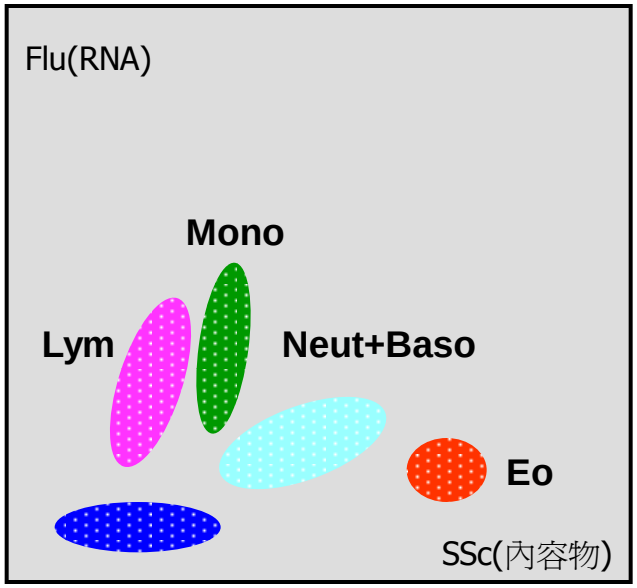

STROMATOLYSER-4DL
STROMATOLYSER-4DS
CELLPACK
900 µl
- Blood: 18 µL
- Reagent: 882µL
18 µL
40 µL
SRV
Reacting
time 22 sec
Temperature:
41℃
Reaction chamber
Optical Detector
Block
Blood

DIFF 的試藥反應

反應前



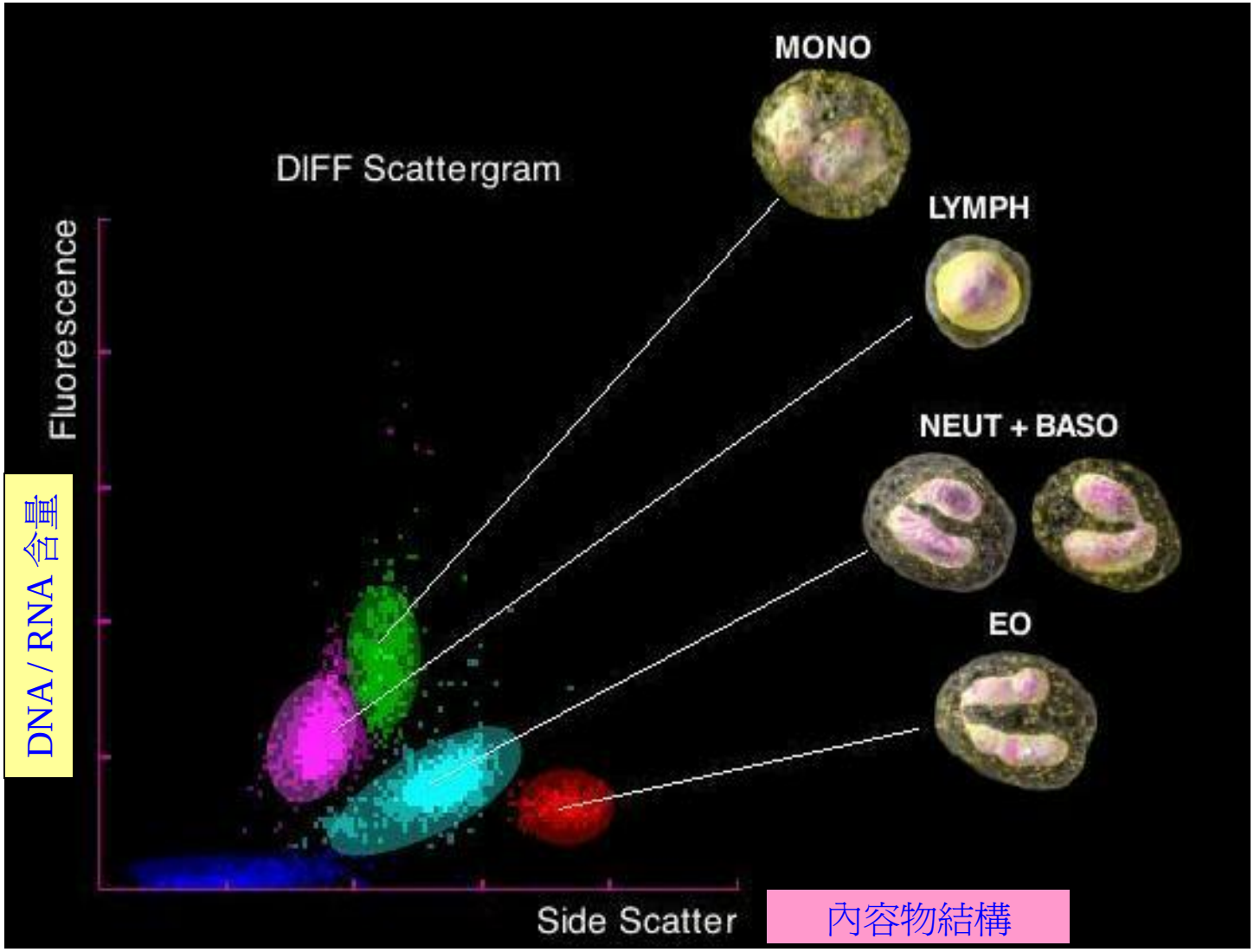
反應後



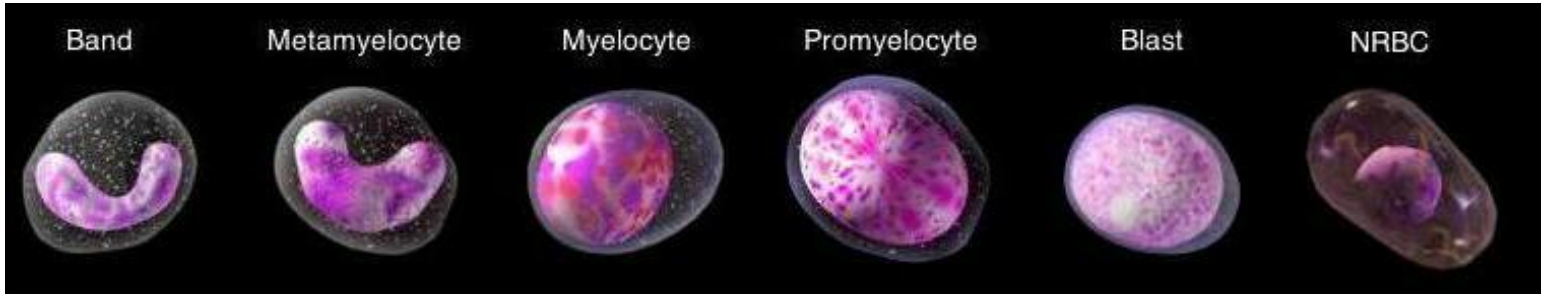
1.針對 Eosinophil以 Organic acid處理, 加強 Side Scatter Light, 以增加 Eo 偵測敏感度

2.中性試劑,含兩種界面活性劑,能將RBC溶解, 而白血球則只有輕微的皺縮, 抗溶解RBC沒有RNA, 也沒有顆粒, 因此即使有紅血球破壞不全的現象, 也不會干擾WBC的分類

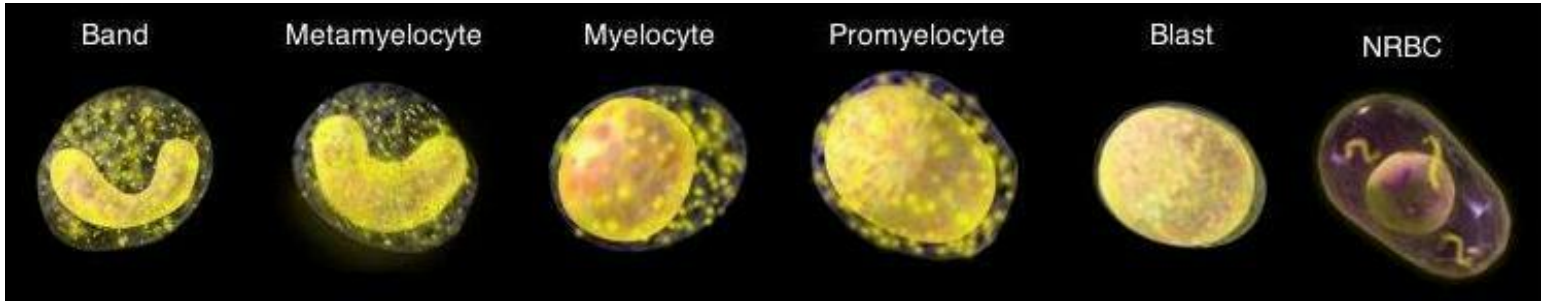
DIFF Scattergram



Young Cell 在 DIFF 的反應



反應前

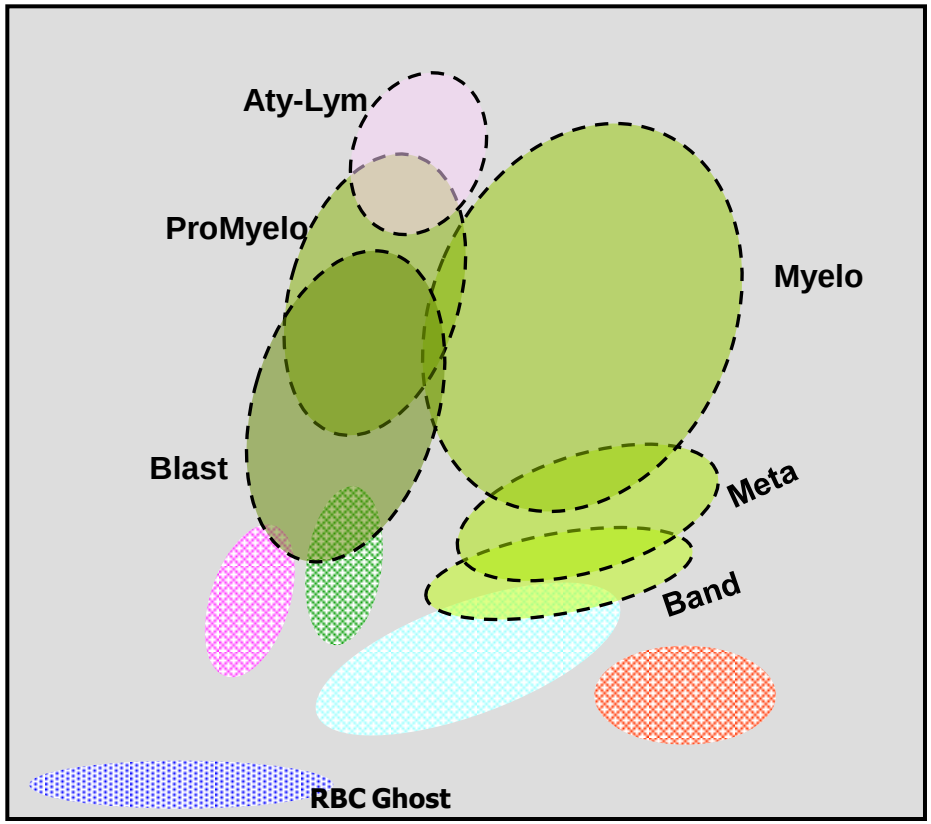


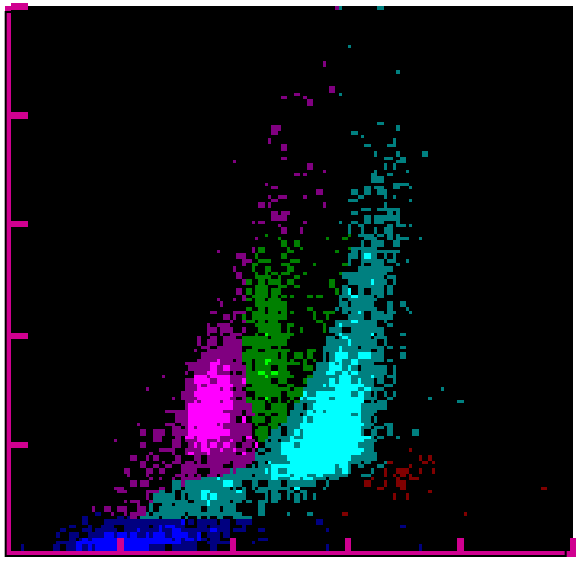
反應後

Immature WBC 含有較多的RNA成份,因此螢光反應較成熟的WBC強

Young Cell 的分佈

DIFF



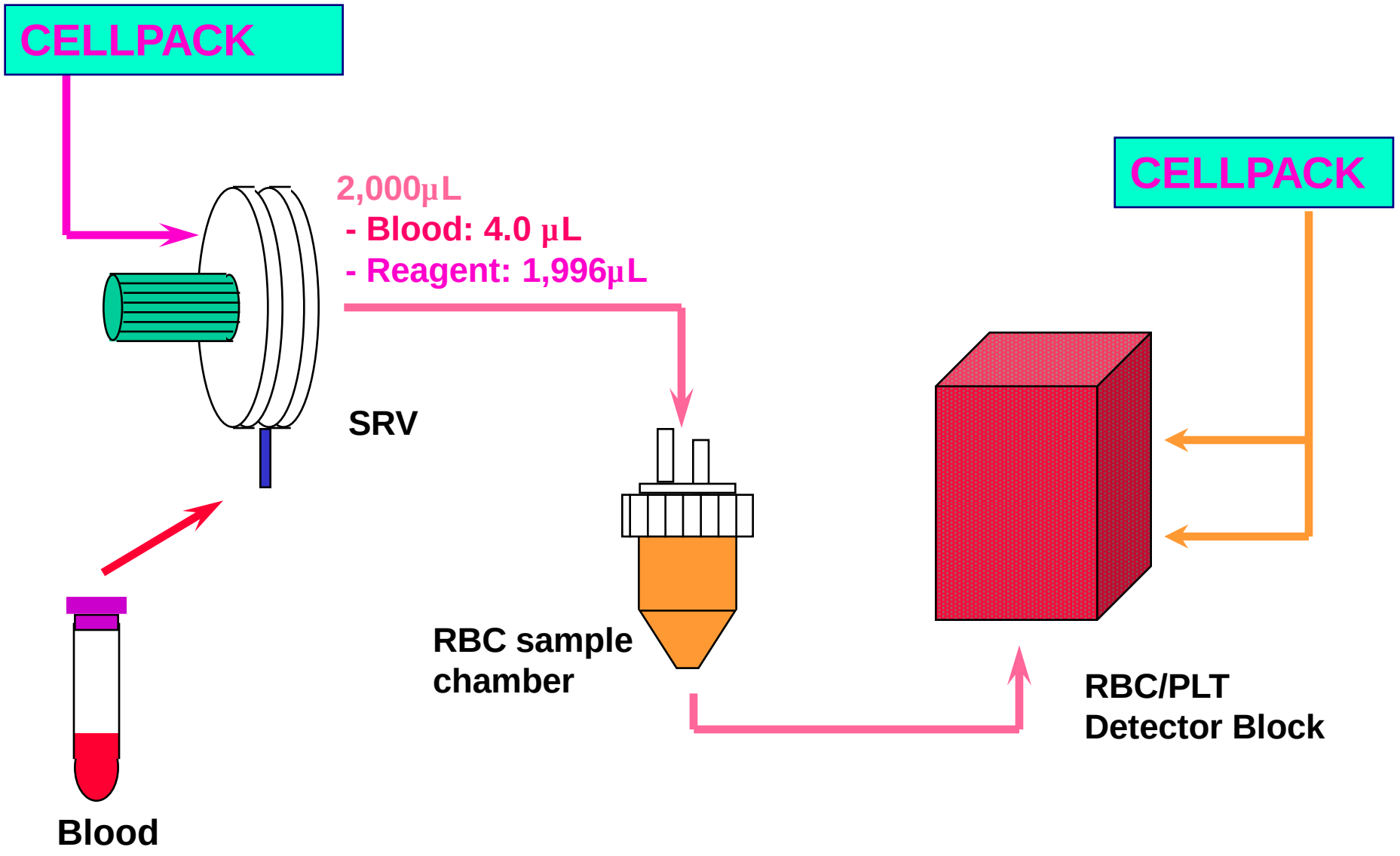


Resistant RBC既沒有RNA, 也沒有顆粒, 因此即使有紅血球破壞不全的現象, 也不會干擾WBC的分類

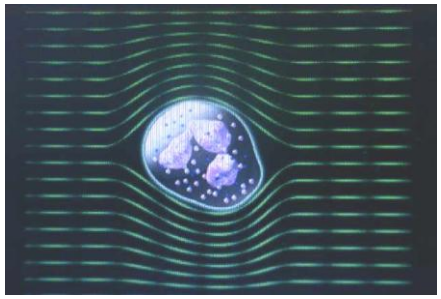
原理-RBC/PLT

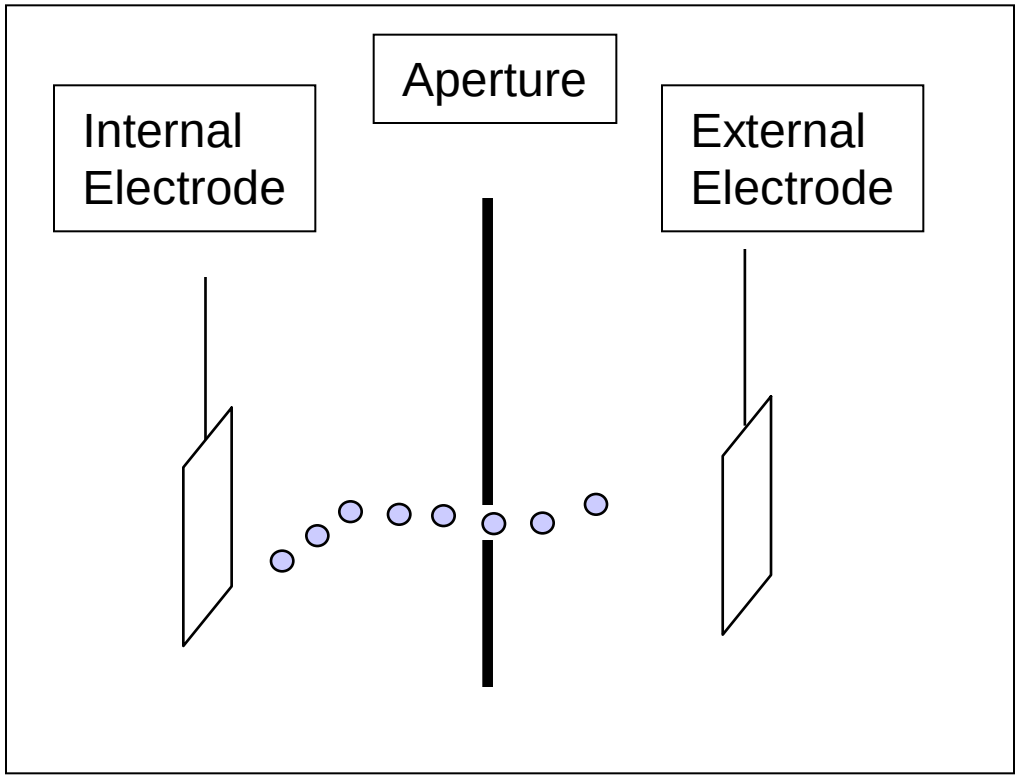
Parameters	Channel/Detector	Principle
WBC, BASO	WBC/Baso	FlowCytometry using Semiconductor laser w/wo Fluorescence
NEUT&BASO, LYMPH, MONO, EO	DIFF	
RBC, HCT, MCV, PLT	RBC/PLT	阻抗+動力聚焦
HGB	HGB	SLS-Hb

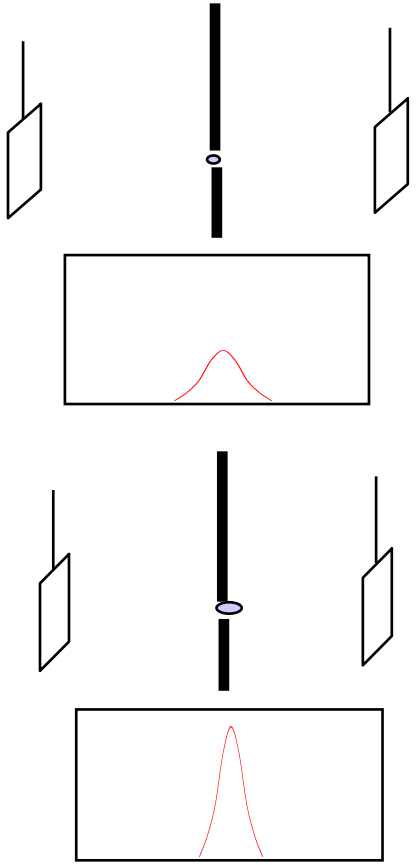
RBC/PLT 的分析流程



阻抗的原理





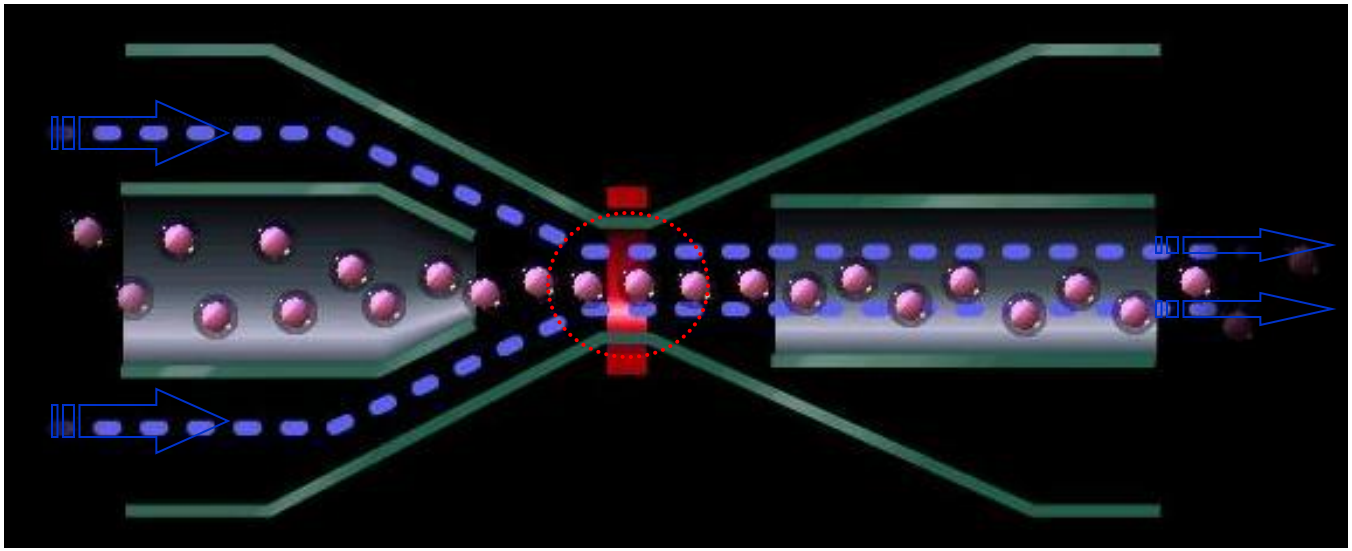


電位=阻抗x電流

儀器供給固定的電流,

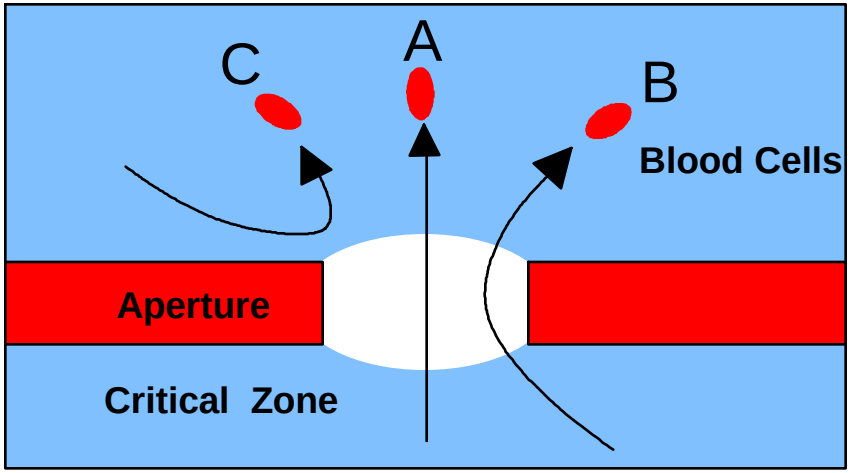
阻抗與電位成正比

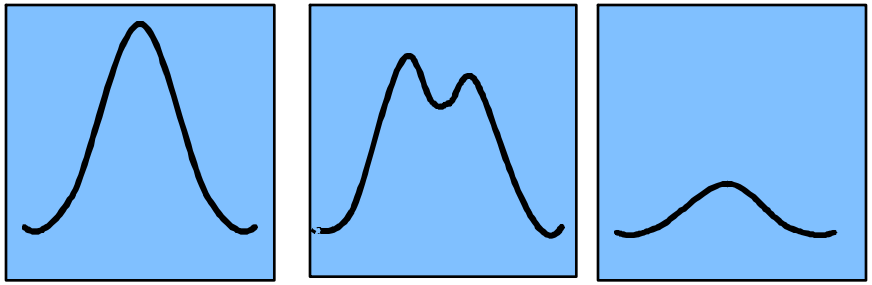
流體動力聚焦



高壓導流液導正血球排列及方向

干擾的修正

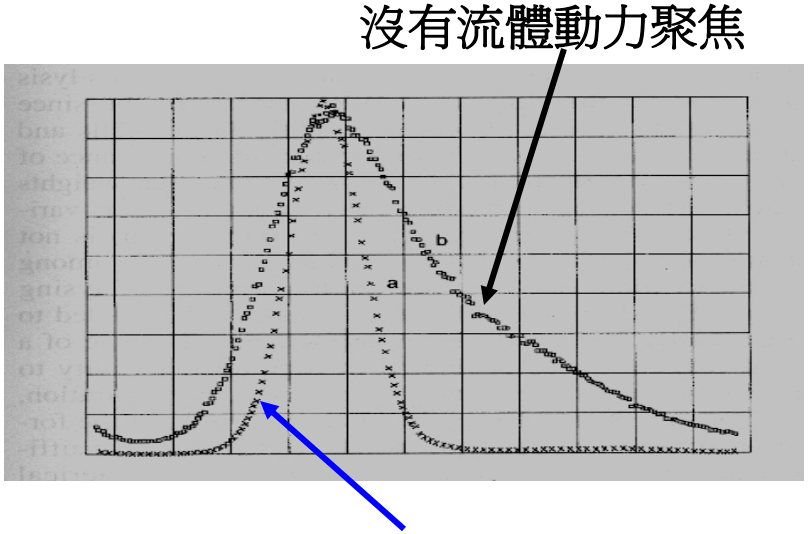




Signal A
OK

Signal B
NG

Signal C
NG



Hydrodynamic Focusing 可避免

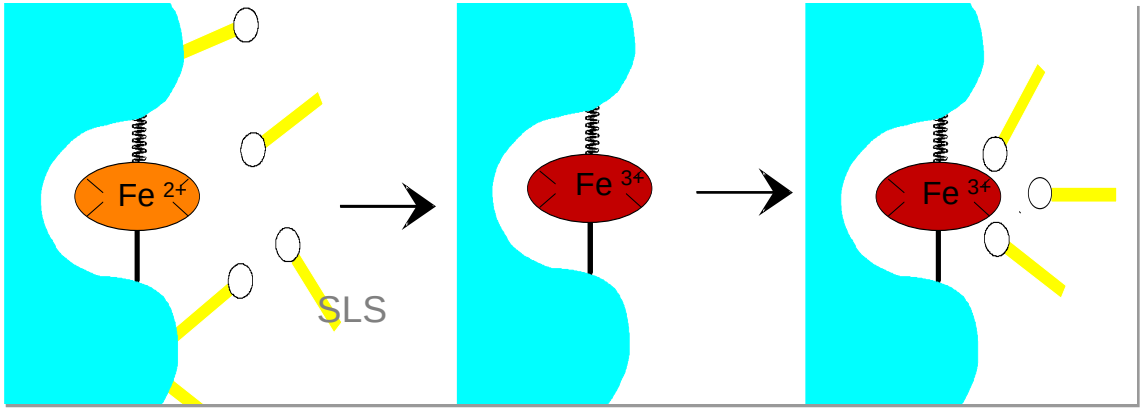
1.前導流液可防止路徑偏斜,
大小測定失真 (Signal B)

2.後導流液可防止迴流,
干擾血小板測定 (Signal C)

原理-HGB

Parameters	Channel/Detector	Principle
WBC, BASO	WBC/Baso	FlowCytometry using Semiconductor laser w/wo Fluorescence
NEUT&BASO, LYMPH, MONO, EO	DIFF	
RET, IRF, PLT-O	RET	
RBC, HCT, MCV, PLT-I	RBC/PLT	阻抗+動力聚焦
HGB	HGB	SLS-Hb

HGB 的試藥反應



- **SLS 親水端與球蛋白結合**
- **立體結構的改變**
- **氧化 : Fe^{2+} --> Fe^{3+}**
- **SLS 厭水端 與 Fe^{3+} 鍵結 --> SLS-Hb**

HGB 的試藥反應

- **SLS (Sodium Lauryal Sulfate)** 是一種**Detergent & Surfactant**。
- 與標準氰化物法相關性高 **(R^2=0.999)**
- **Cyanide free reagent** ；無生物毒性。
- **Formadehyde free reagent** ；不刺激呼吸系統。
- 沒有 **Oxyhemoglobin method** 無法氧化 **Methemoglobin** 的缺點。

Sysmex

Characteristics of animal blood

	Human	Monkey	Mouse	Rat	Rabbit	Dog	Horse	Cat	Guinea Pig
RBC	3.96–6.13	3.00–9.00	6.70–12.5	5.0–12.0	3.0–8.6	4.3–8.8	6.0–11.0	4.50–9.00	3.00–7.00
Hgb	11.2–18.4	9;0–17.3	10.2–16.6	11.1–18.0	9.3–19.3	10.0–19.0	8.0–15.0	9.0–12.7	11.2–18.1
MCV	78–110	50–105	31–62	45–69	57–90	50–88	26–58	49–59	61–98
MCH	24–40	17.1–35.7	9.2–20.8	12.0–24.5	22.0–38.7	15.0–29.0	10.0–20.0	13.0–17.0	22.5–28.5
Hct	35.0–52.2	30.0–50.0	32.0–54.0	36.0–52.0	30.0–53.0	32.0–60.0	26.0–42.0	34.0–46.0	37.0–51.0
PLT	130–300	200–600	800–2000*	800–1500*	120–800	160–650	150–400	70–400	225–800
WBC	4.12–10.8	4.00–22.0	5.40–16.0	3.0–15.0	2.0–15.0	7.0–22.0	5.0–11.9	6.0–12.0	5.0–18.0
Neut	46.9–64.9	14.0–71.0	8.0–42.9	5.0–50.0	10.0–85.0	22.0–96.0	36.0–89.0	40.0–82.0	20.0–60.0
Eos	0.9–5.1	O–16.0	0–2.9	0–4.0	0–8.0	0–18.0	0.5–8.8	2.0–11.0	0.–8.0
Baso	0.04–1.10	0–4.0	0–0.85	0–2.0	0–8.0	0–1.0	0–2.0	0–1.0	0–2.0
Lymph	28.0–42.0	20.0–95.0	55.0–95.0	40.0–95.0	25.0–95.0	5.0–52.0	10.0–48.0	15.0–48.0	50.1–95.7
Mono	4.2–8.2	0.0–8.0	0.0–8.0	0.0–8.0	0.5–16.0	0.0–8.0	1.0–15.0	1.0–9.0	1.0–9.0

RABBIT

on Report Setting Window Help

Help | Manual | Sampler | save | menu | QC | work list | explorer | browser | man.ana. | Auto | Manual | delete | Upper | Lower | last20 | validate

Negative

Sample No. COR-RB2210 Meas. Date 2004/08/16 Meas. Time 18:09

Category Sex Age/LL Age/UL Age

Animal Spec. Other Attr. R Operator Service Ana. Profile

Main | Graph | WBC | RBC | Service | Research(W) | Research(R)

Items

Item	Data		Unit
WBC	5.20		10^3/uL
RBC	5.49		10^6/uL
HGB	11.7	-	g/dL
HCT	37.2	-	%
MCV	67.8		fL
MCH	21.3		pg
MCHC	31.5		g/dL
PLT	329		10^3/uL
RDW-SD	38.7		fL
RDW-CV	16.2		%
PDW	6.8		fL
MPV	7.4		fL
P-LCR	8.8		%
PCT	0.24		%
RET%	4.57		%
RET#	250.9		10^9/L
IRF	13.1		%
LFR	86.9		%
MFR	12.7		%
HFR	0.4		%

WBC Differential

Item	Data		Unit
NEUT#	0.96		10^3/uL
LYMPH#	3.84		10^3/uL
MONO#	0.15		10^3/uL
EO#	0.06		10^3/uL
BASO#	0.19		10^3/uL

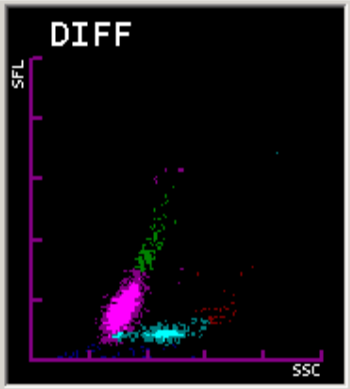
Item	Data		Unit
NEUT%	18.4		%
LYMPH%	73.8		%
MONO%	2.9		%
EO%	1.2		%
BASO%	3.7		%

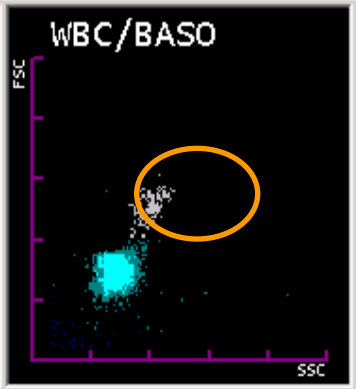
Flag(s)

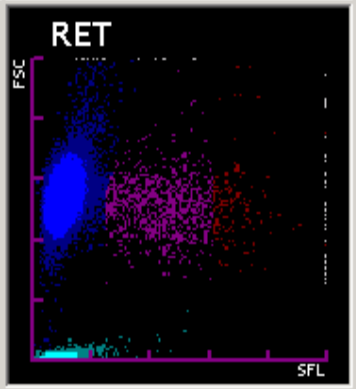
WBC

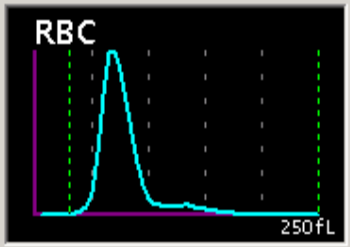
RBC/RET

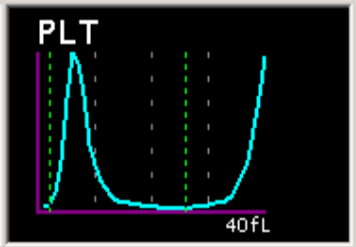
PLT











INS****1

MOUSE

on Report Setting Window Help

Help | Manual | Sampler | save | menu | QC | work list | explorer | browser | man.ana. | Auto | Manual | delete | Upper | Lower | last20 | validate

Sysmex

Negative

Sample No. COR-MS1301 Meas. Date 2004/08/30 Meas. Time 12:21

Category Sex Age/LL Age/UL Age

Animal Spec. Other Attr. R Operator Service Ana. Profile

Main | Graph | WBC | RBC | Service | Research(W) | Research(R)

Items

Item	Data		Unit
WBC	2.59		10^3/uL
RBC	9.81		10^6/uL
HGB	15.0		g/dL
HCT	51.6		%
MCV	52.6		fL
MCH	15.3		pg
MCHC	29.1		g/dL
PLT	1816	+	10^3/uL
RDW-SD	32.5		fL
RDW-CV	21.0		%
PDW	7.1		fL
MPV	6.6		fL
P-LCR	4.2		%
PCT	1.20		%
RET%	4.72		%
RET#	463.0		10^9/L
IRF	49.7		%
LFR	50.3		%
MFR	23.4		%
HFR	26.3		%

WBC Differential

Item	Data		Unit
NEUT#	0.58		10^3/uL
LYMPH#	1.96		10^3/uL
MONO#	0.03		10^3/uL
EO#	0.02		10^3/uL
BASO#	0.00		10^3/uL

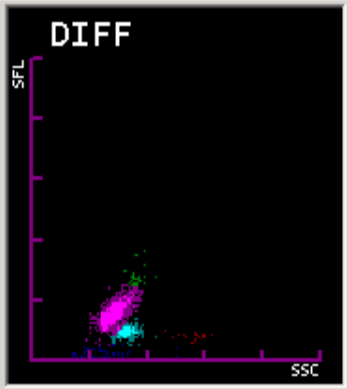
Item	Data		Unit
NEUT%	22.3		%
LYMPH%	75.7		%
MONO%	1.2		%
EO%	0.8		%
BASO%	0.0		%

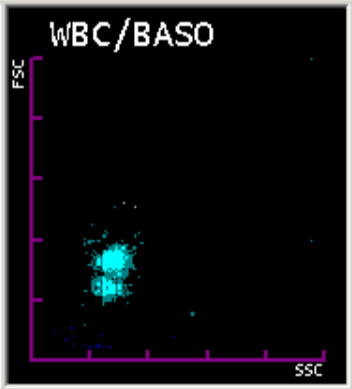
Flag(s)

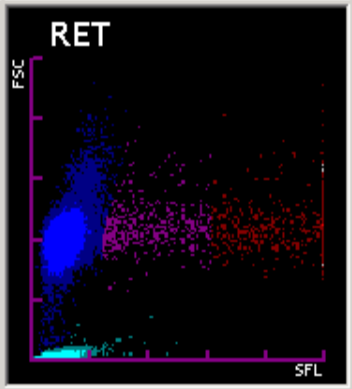
WBC

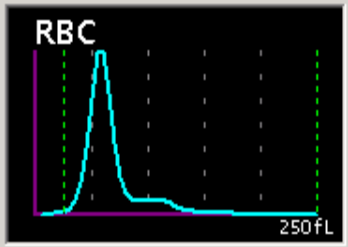
RBC/RET

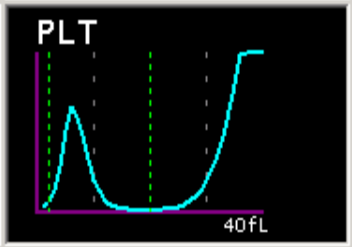
PLT











INS****1

Dog

Report Setting Window Help

menu QC work list explorer browser man.ana. Auto Manual delete Upper Lower last20 validate

Sysmex

egative

Sample No. COR-DG2105 Meas. Date 2004/07/26 Meas. Time 11:58

Category Sex Age/LL Age/UL Age

Animal Spec. Other Attr. R Operator Service Ana. Profile

ain | Graph | WBC | RBC | Service | Research(W) | Research(R)

Items

Item	Data		Unit
WBC	11.06		10^3/uL
RBC	7.75		10^6/uL
HGB	18.6		g/dL
HCT	55.1		%
MCV	71.1		fL
MCH	24.0		pg
MCHC	33.8		g/dL
PLT	345		10^3/uL
RDW-SD	37.2		fL
RDW-CV	17.7		%
PDW	11.7		fL
MPV	10.6		fL
P-LCR	28.9		%
PCT	0.37		%
RET%	0.45		%
RET#	34.9		10^9/L
IRF	22.9		%
LFR	77.1		%
MFR	16.2		%
HFR	6.7		%

WBC Differential

Item	Data		Unit
NEUT#	6.59		10^3/uL
LYMPH#	3.70		10^3/uL
MONO#	0.31		10^3/uL
EO#	0.45	+	10^3/uL
BASO#	0.01		10^3/uL

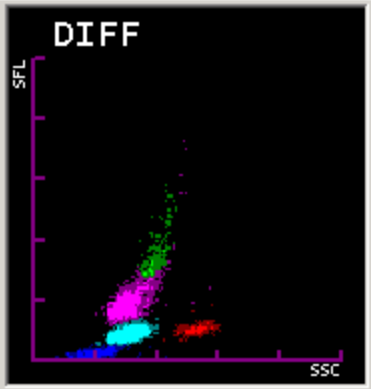
Item	Data		Unit
NEUT%	59.5		%
LYMPH%	33.5		%
MONO%	2.8		%
EO%	4.1		%
BASO%	0.1		%

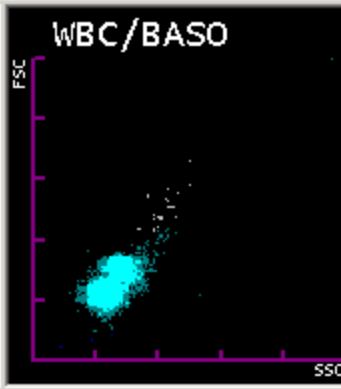
Flag(s)

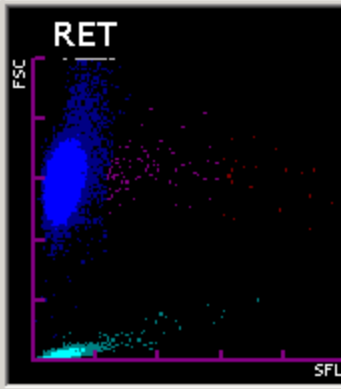
WBC

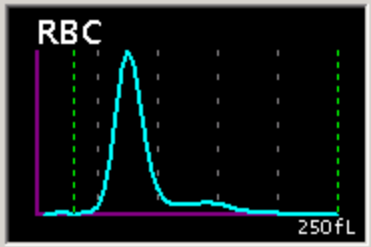
RBC/RET

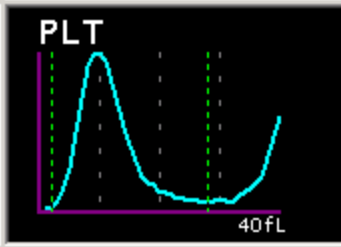
PLT





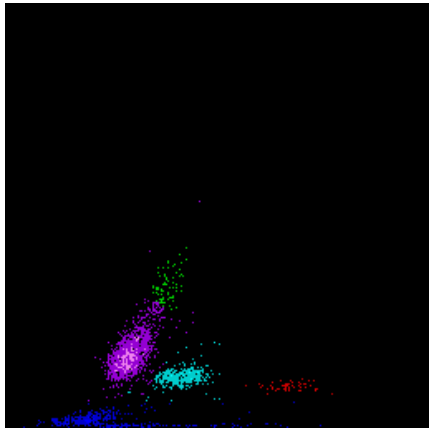




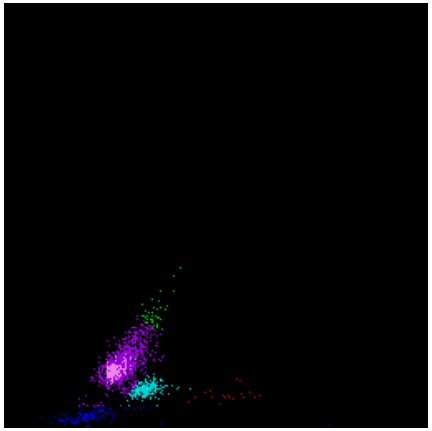


The difference of DIFF scattergram between animal species

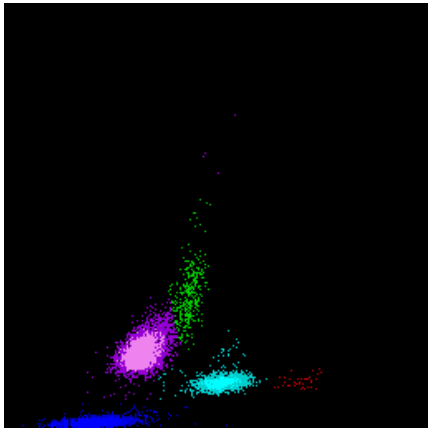
Rat



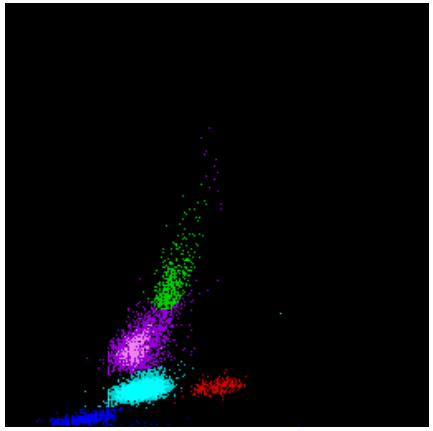
Mouse



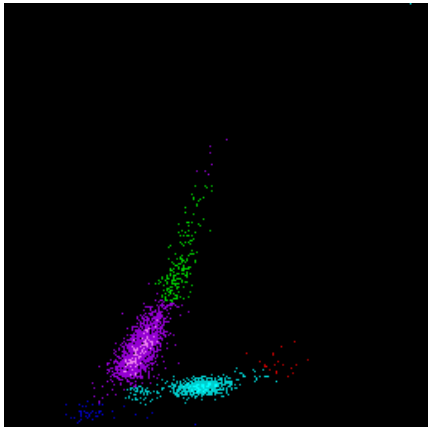
Monkey



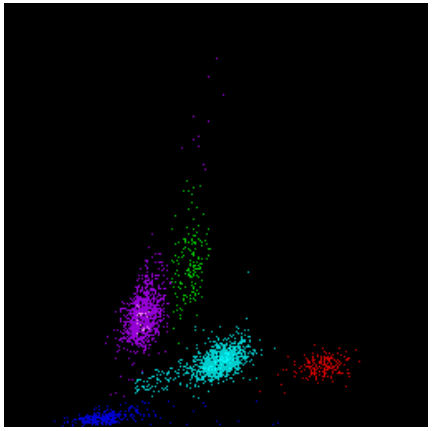
Dog



Rabbit

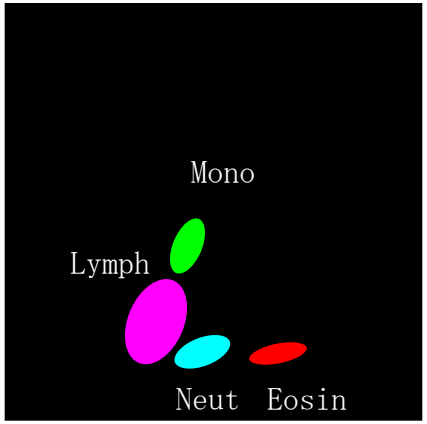


Human

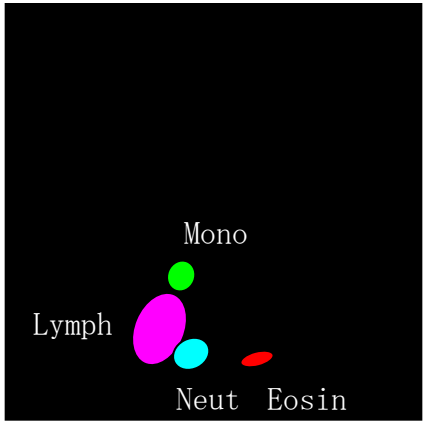


The DIFF scattergram is difference for every animals

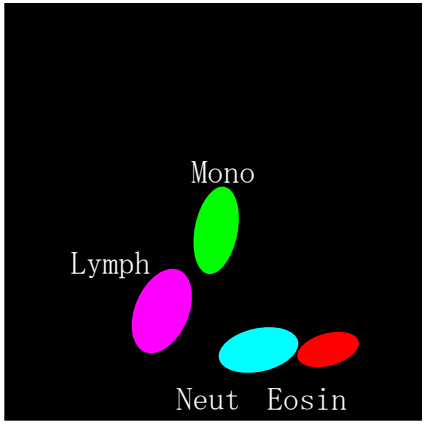
Rat



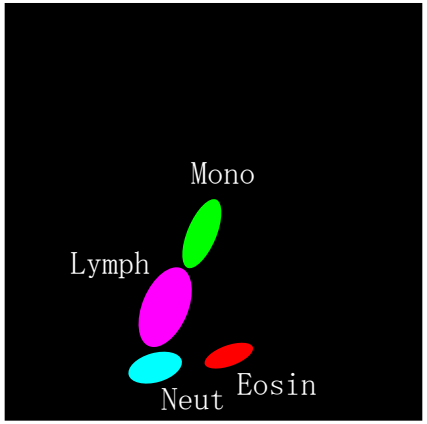
Mouse



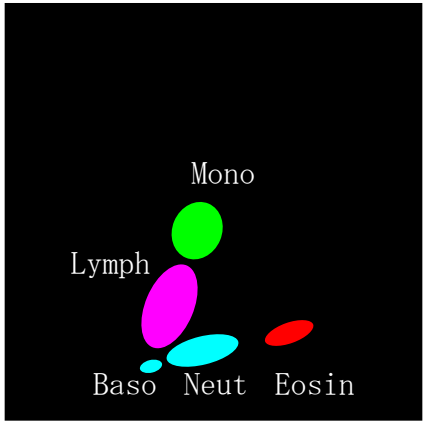
Monkey



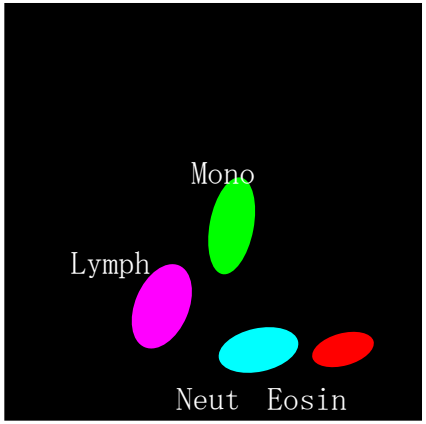
Dog



Rabbit

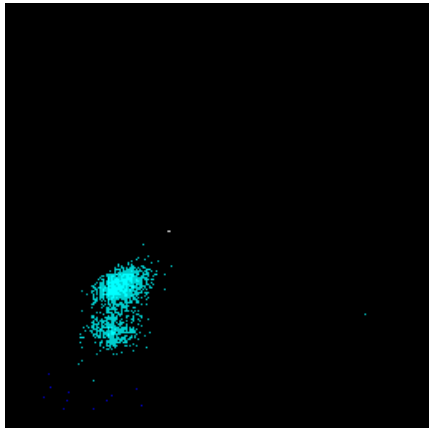


Human

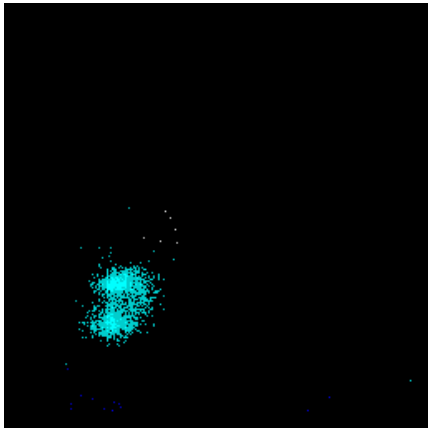


The difference of BASO scattergram between animal species

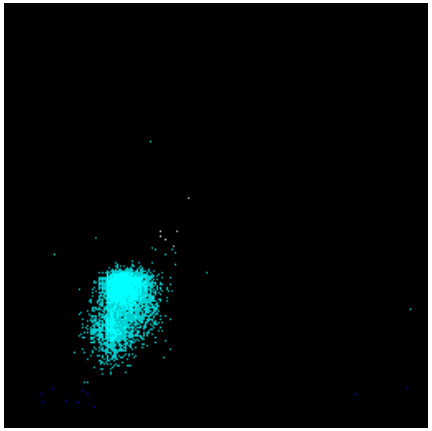
Rat



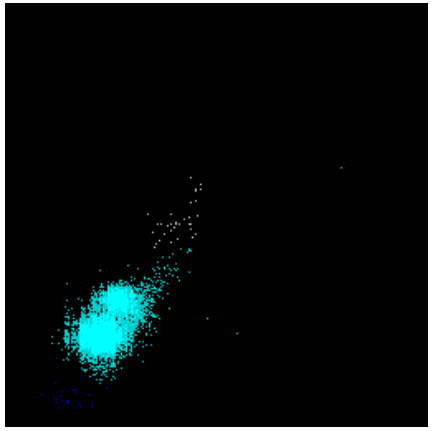
Mouse



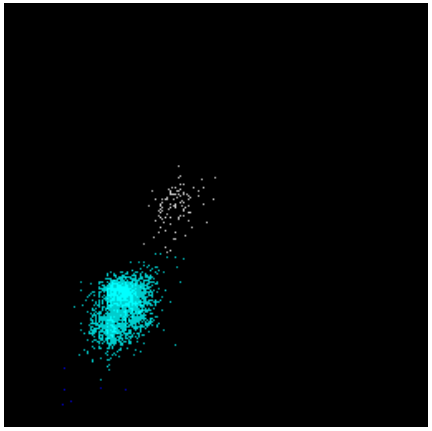
Monkey



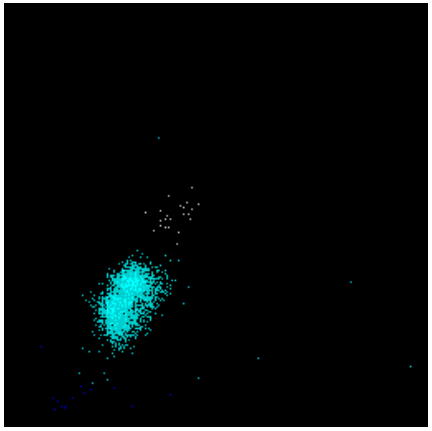
Dog



Rabbit

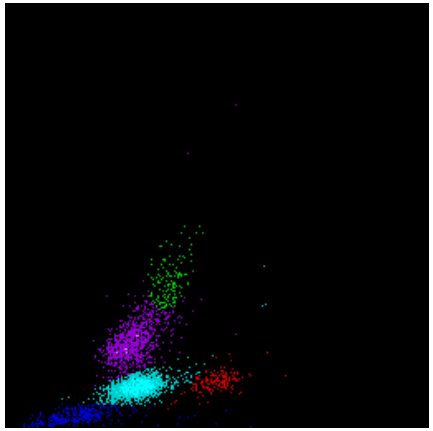


Human

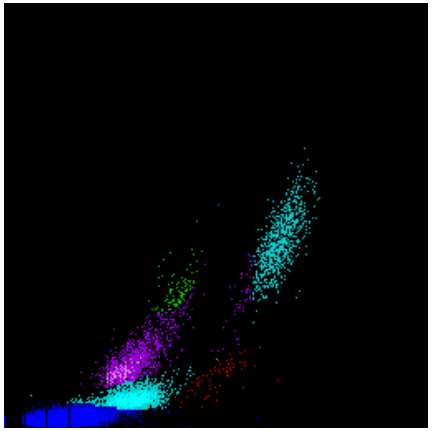


Under development cat horse guinea pig

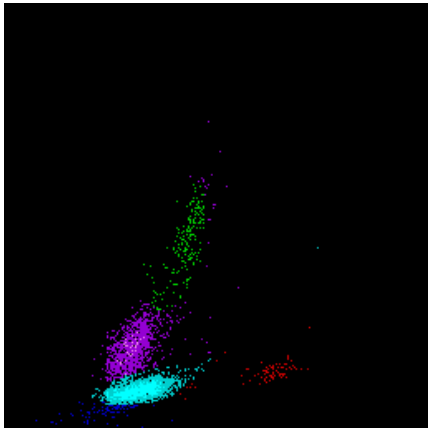
Dog Normal



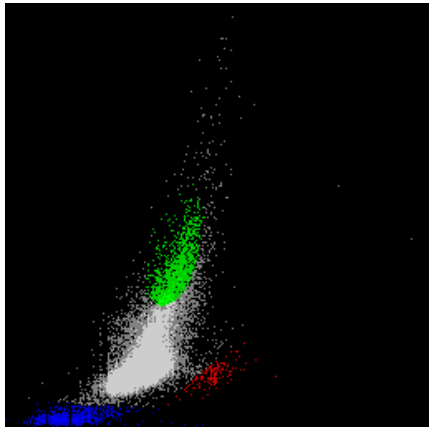
Cat Normal



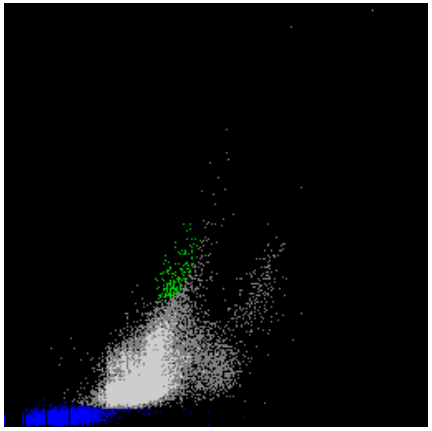
Horse Normal



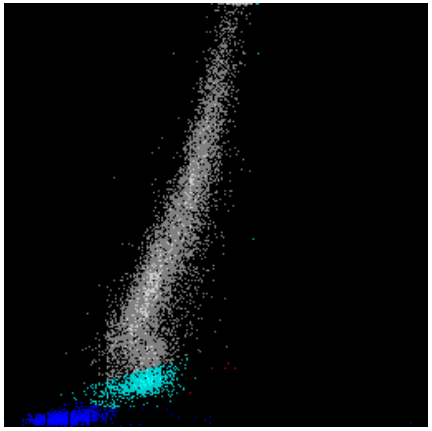
Dog Abnormal



Cat Abnormal



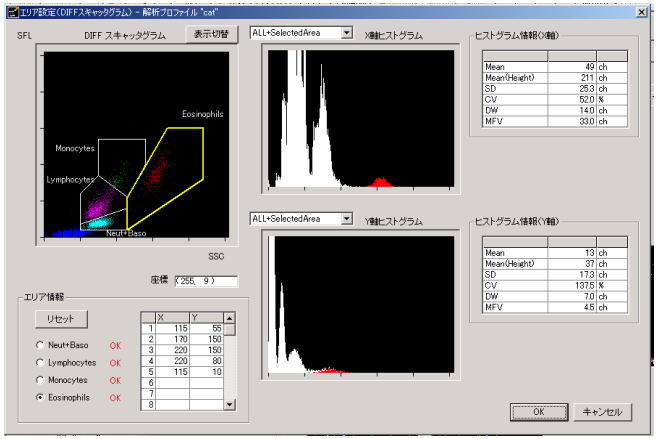
Horse Abnormal



Manual analyzer function

Sysmex

New Application of XT-1800iV



手動分析儀針對血球以外的細胞偵測是有用的工具
客戶可以訂定不同細胞種類的區間. 之後的檢體將依循所訂定的區間來分析.

使用手動分析儀可以分析體液

- **bronchoalveolar lavage fluid (BALF)**（気管支肺胞洗浄液）
- **fluid in the pleural space** (胸膜腔内液）
- **ascites fluid**（腹水）
- **Bone Marrow**（骨髓）

可以分析軟體沒有支援的動物檢體

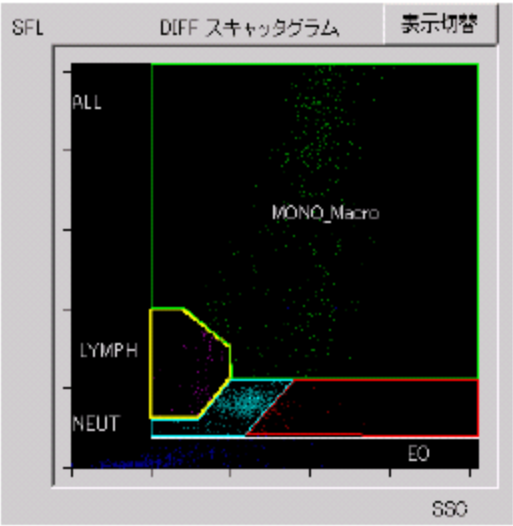
Application #1:
Broncho alveolar lavage fluid (BALF）氣管支肺胞洗浄液）

- BALF is the a physiological salt solution after washing rat/mouse lung to collect blood cells especially eosinophil, neutrophil and macropharge.
- This test is performed to check medical reaction of allergic or asthma medicine.
- This test is commonly performed in pharmaceutical company where cold medicine or asthma medicine is produced.
- Manual analyzer function of XT-iV can replace current BALF examination which takes time due to classical way of microscopy.

Sysmex

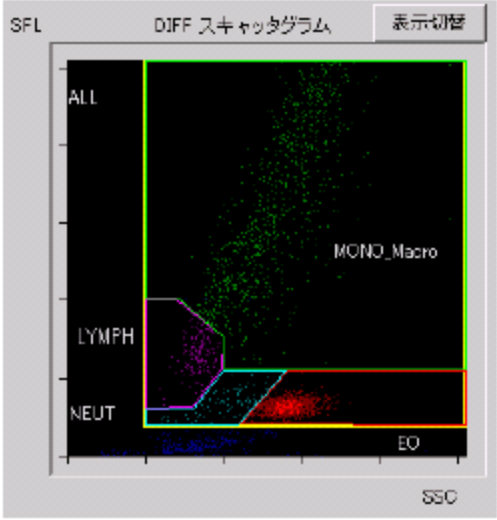
BALF measurement

- BALF can be measured same as whole blood analysis after centrifuging sample.
- White blood cells in BALF locates same as whole blood.
- Macropharge is located right upper side of monocite.
- Flexible user defined gate setting realized macropharge measurement of BALF or abdominal dropsy.



Rat: neutrophillia case
Neut: 51.5%
Eo: 5.6%

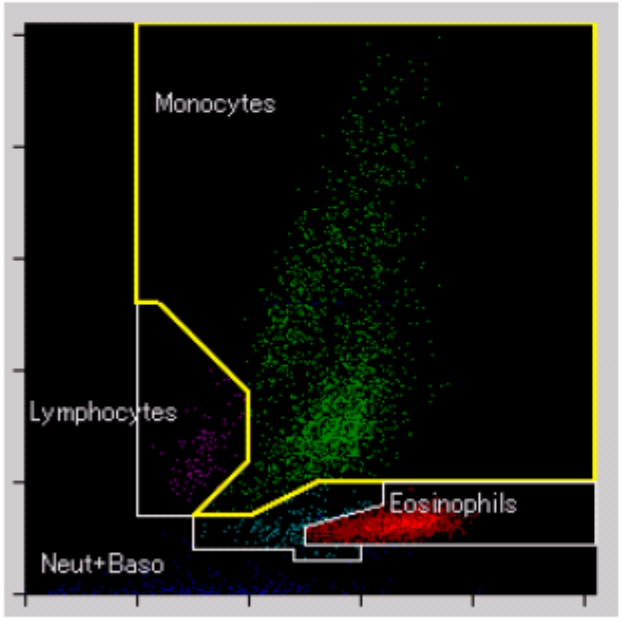
Rat: eosiophillia case
Neut: 3.2%
Eo: 49.0%



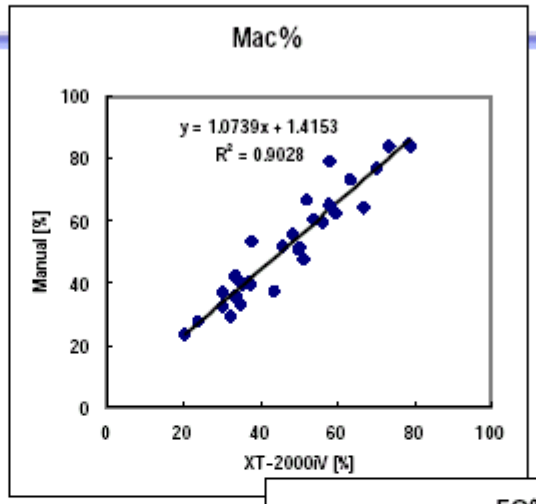
Sysmex

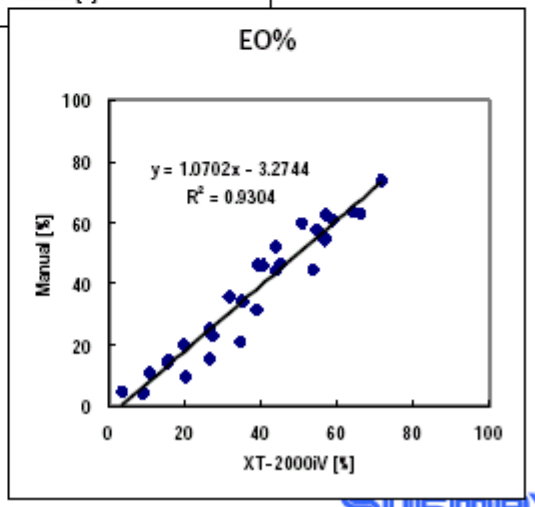
Guinea pig's BALF

Reanalyze by manual gate



Scattergram of Guinea Pig's BALF

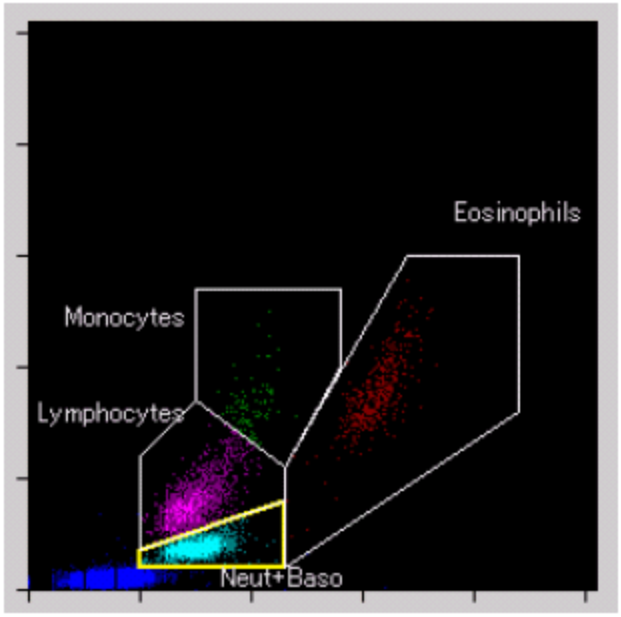


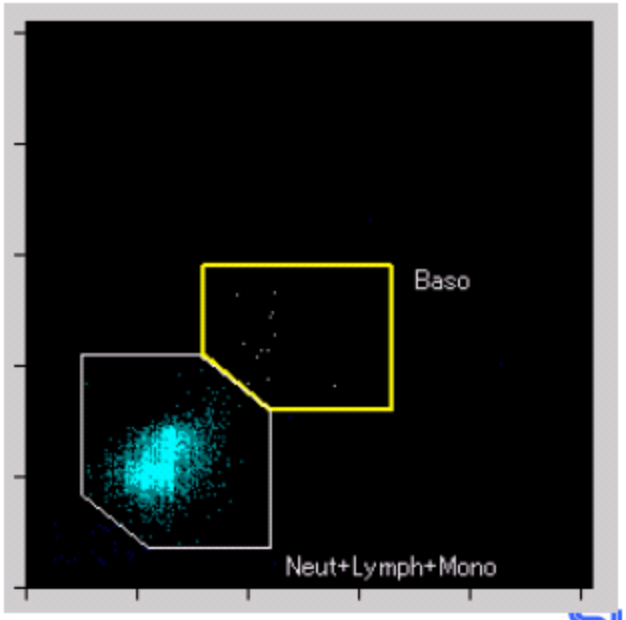


Application #2

- To classify the gates of abnormal samples or unsupported animal species.

Assay result for Cat





XT-2000iV - [Manual Analyzer]

File Edit View Record Action Report Setting Window Help

Help | Manual | Sampler | save | meru | QC | work list | explorer | browser | man.ana. | Auto | Manual | delete | Upper | Lower | last20 | validate

Negative

Rat

Sample No. RAT-003

Category Rat Std.

Age/Lower 0.0 Year

Age/Upper 999.9 Year

Sex Both

Measure Date 2004/04/27 21:04

Ana. Date 2005/02/10 11:29

Analyzed Profile Rat P2-1

Profile Comment Rat Test Pattern 2-1

New | Save | Reana | switch | VIEW

Editing Profile Rat P2-1

Editing Comment Rat Test Pattern 2-1

Measure Item

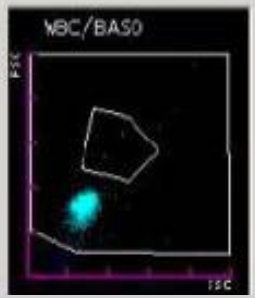
Item	Data	Unit
WBC	15.2	10^2/ul
NEUT#	2.5	10^2/ul
LYMPH#	11.3	10^2/ul
MONO#	1.2	10^2/ul
EO#	0.2	10^2/ul
BASO#	0.0	10^2/ul
NEUT%	4.5	%
LYMPH%	92.9	%
MONO%	2.2	%
EO%	0.4	%
BASO%	0.0	%
RBC	619	10^4/ul
HGB	12.5	g/dL
HCT	42.7	%
MCV	69.0	fL
MCH	20.2	pg
MCHC	29.3	g/dL
PLT	117.3	10^4/ul
RDW-SD	18.7	fL
RDW-CV	15.5	%
PDW	7.6	fL
MPV	7.4	fL
P-LCR	7.2	%
PCT	1.01	%
RET%	11.97	%
RET#	81.47	10^4/ul
IRF	----	%
LFR	----	%
MFR	----	%
HFR	----	%

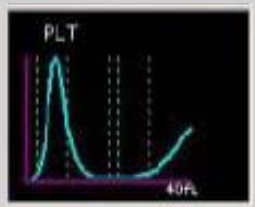
WBC Flag

RBC/RET Flag

PLT Flag

Manual analysis(Basic) | Manual analysis(Ext-WBC) | Manual analysis(Ext-RET)





XT-2000iV-1 | 1 | Manager

Thank You for Your Attention

Sysmex SANTUNG