

Verein für  
Association pour le  
Associazione per il



medizinische Qualitätskontrolle  
contrôle de qualité médical  
controllo di qualità medico

Report

# Differential Blood Smear H3

MQ 2020-4

## Acknowledgements

The Mythic 18 analyzer was provided by the company Polymed, the ABX Microsemi CRP analyzer by the company Axonlab and the XP-300 analyzer by the Firma Sysmex. MQ employees conducted the measurements.

The findings of the XE-5000 and ADVA 2120 devices and of the microscopic blood counts were generated by the Central Laboratory of Medical Diagnostic HAD of the University Hospital Zurich Hematology Clinic. The lab is ISO/IEC 17025 certified (STS 445). Dr. J-D. Studt is the responsible manager; Prof. MG Manz, M.D., the clinic director.

[www.haematologie.usz.ch](http://www.haematologie.usz.ch)

For information regarding all analyses offered by the University Hospital of Zurich, see:

[www.uzl.usz.ch](http://www.uzl.usz.ch)

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# 1 Sample A

## 1.1 ABX Microsemi CRP



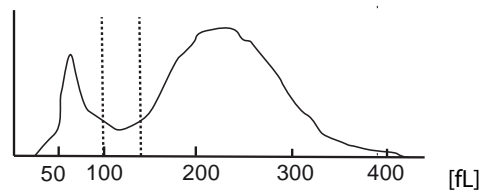
### Findings MQ 2020-4 H3A

70 year old woman

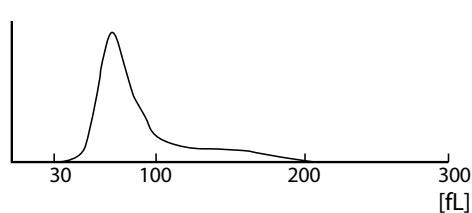
WBC :	21.3	H	10 <sup>9</sup> /L	MCV :	87.6	fL
RBC :	3.25	L	10 <sup>12</sup> /L	MCH :	30.8	pg
HGB :	10.0	L	g/L	MCHC:	35.2	g/L
HCT :	28.4	L	L/L	RDW :	10.7	%
PLT :	260		10 <sup>9</sup> /L	MPV :	7.2	fL
PCT :	0.186		10 <sup>-2</sup> L/L	PDW :	12.6	%

DIFF:				#LYM:	4.8	H	10 <sup>9</sup> /L
%LYM:	48.8	H	%	#MON:	1.0	H	10 <sup>9</sup> /L
%MON:	10		%	#GRA:	4.0		10 <sup>9</sup> /L
%GRA:	41.2	L	%				

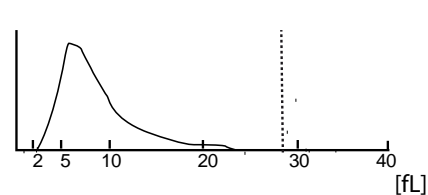
#### WBC



#### RBC



#### PLT

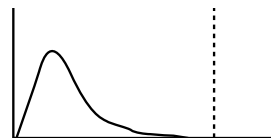
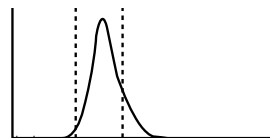
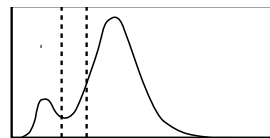


## 1.2 Mythic



### Findings MQ 2020-4 H3A 70 year old woman

WBC	22.5	H	10 <sup>9</sup> /l	3.5	/	10.0
LYM	2.6		10 <sup>9</sup> /l	1.2	/	3.2
MON	1.9	H	10 <sup>9</sup> /l	0.1	/	1.0
GRA	18.0		10 <sup>9</sup> /l	1.2	/	6.8
LYM%	11.5	L	%	17.0	/	48.0
MON%	8.5		%	2.0	/	10.0
GRA%	80.0	h	%	43.0	/	76.0
RBC	3.37	l	10 <sup>12</sup> /l	4.00	/	5.70
HGB	107	l	g/l	120	/	180
HCT	0.318	l	l/l	0.360	/	0.540
MCV	94.4		fl	80.0	/	100.0
MCH	31.8		pg	26.0	/	34.0
MCHC	336		g/l	310	/	365
RDW	13.4		%	10.0	/	16.0
PLT	253		10 <sup>9</sup> /l	150	/	400
MPV	8.3		fl	7.0	/	11.0
PCT	0.210		cl/l	0.100	/	0.500
PDW	13.2		%	10.0	/	18.0



FLAGS : FL2FL3FL4

LEUCOCYTOSIS LYMPHOPENIA MONOCYTOSIS GRANULOCYTOSIS ANEMIA

### 1.3 Sysmex XP300



**Findings MQ 2020-4 H3A**  
70 year old woman

WBC	+	23.6	$10^3/\mu\text{L}$	<b>WBC</b> 
RBC	-	3.49	$10^6/\mu\text{L}$	
HGB	-	11.1	g/L	
HCT	-	32.6	%	
MCV		93.4	fL	
MCH		31.8	pg	
MCHC		34.0	g/L	
PLT		264	$10^3/\mu\text{L}$	<b>RBC</b> 
LYM%	-	12.3	%	
MXD%		5.0	%	
NEUT%	+	82.7	%	
LYM#		2.9	$10^3/\mu\text{L}$	
MXD#	+	1.2	$10^3/\mu\text{L}$	
NEUT#	+	19.5	$10^3/\mu\text{L}$	
RDW_SD	+	49.2	fL	<b>PLT</b> 
RDW_CV		13.9	%	
PDW		11.3	fL	
MPV		9.6	fL	
P_LCR		21.3	%	
PCT		0.25	%	

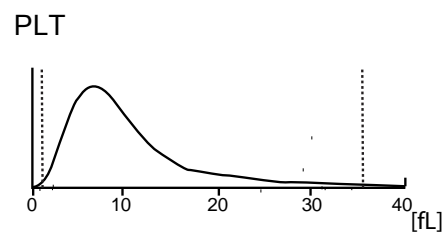
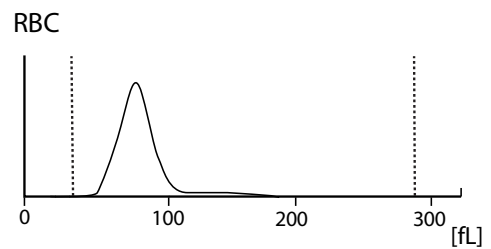
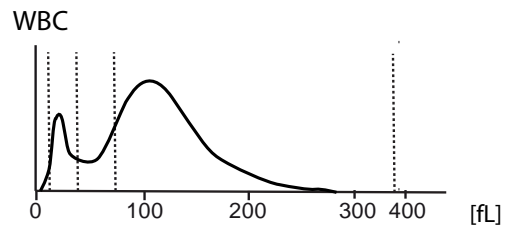
### 1.4 Zybio Z3 CRP



#### Findings MQ 2020-4 H3A

70 year old woman

WBC	22.43	↑	10 <sup>3</sup> /μl	3.50-9.50
Lym#	3.14		10 <sup>3</sup> /μl	1.10-3.20
Mid#	1.50		10 <sup>3</sup> /μl	0.10-3.20
Gran#	17.79	↑	10 <sup>3</sup> /μl	1.80-6.30
LYM%	14.0	↓	%	20.0-50.0
Mid%	6.7		%	3.0-15.0
GRA%	79.3	↑	%	40.0-75.0
RBC	3.48	↓	10 <sup>6</sup> /μl	3.80-5.80
HGB	10.6	↓	g/dl	11.5-17.5
HCT	32.5	↓	%	35.0-50.0
MCV	93.2		fl	82.0-100.0
MCH	30.5		pg	27.0-34.0
MCHC	32.7		g/dl	31.6-35.4
RDW-CV	14.0		%	11.5-16.0
RDW-SD	44.3		fL	35.0-56.0
PLT	295		10 <sup>3</sup> /μl	125-350
MPV	8.6		fl	6.5-12.0
PDW	16.7		fL	9.0-17.0
PCT	0.255		%	0.108-0.282
P-LCC	57		10 <sup>3</sup> /μl	30-90
P-LCR	19.3		%	11.0-45.0



## 1.5 Sysmex XN-20



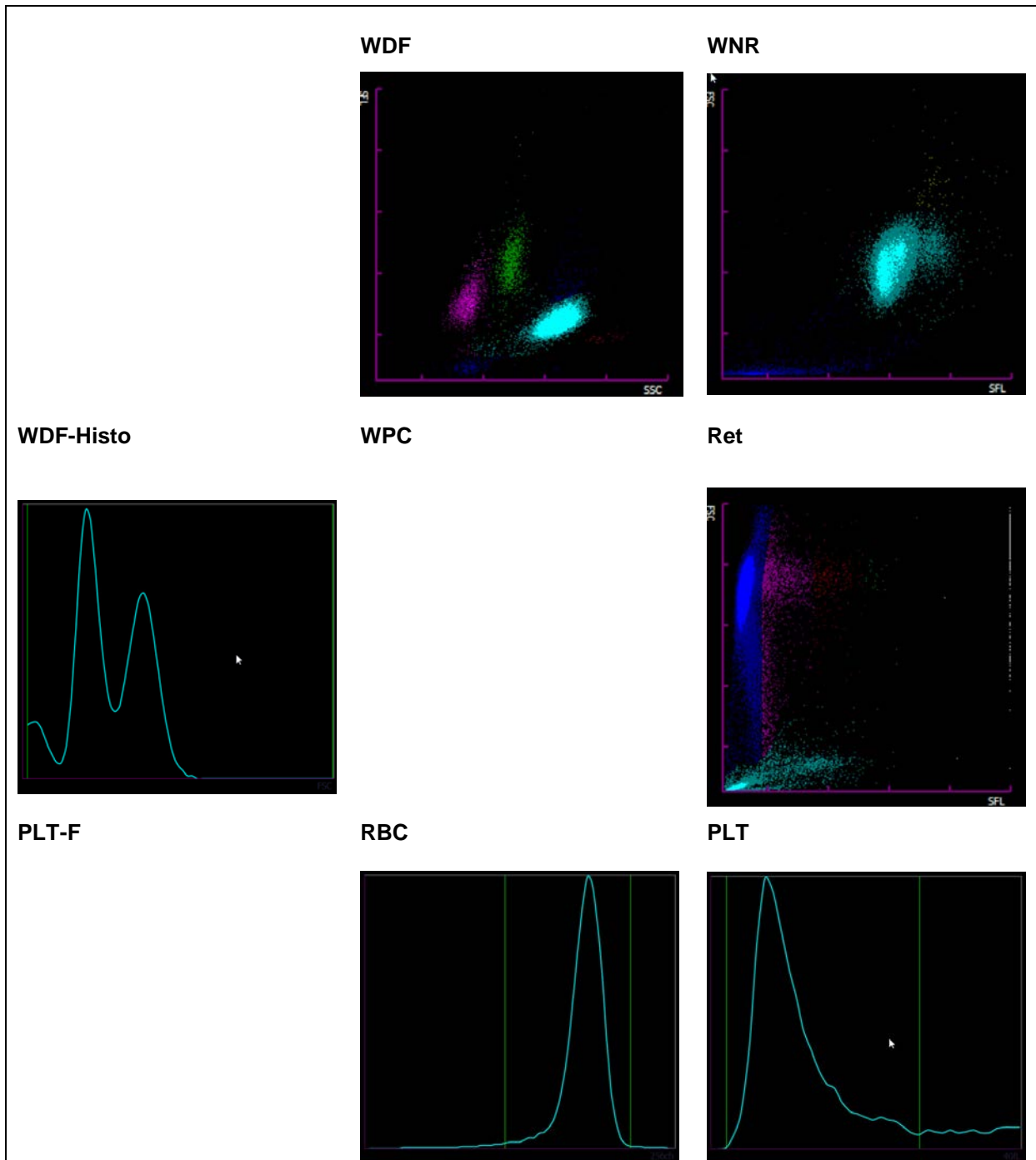
### Findings MQ 2020-4 H3A

70 year old woman

Analysis	Result	Unit	Reference value
<b>Blood Count</b>			
<u>Hemoglobin</u>	136	g/l	117-153
<u>Hematocrit</u>	0.410	l/l	0.35-0.46
Erythrocytes	4.41	T/l	3.9-5.2
MCV	93.0	fl	80-100
MCH	30.8	pg	26-34
MCHC	332	g/l	310-360
Mikrocytes	* 15.0	%	11.0-14.8
<u>Thrombocytes</u>	236	G/l	143-400
<u>Leucocytes</u>	* 20.13	G/l	3.0-9.6
<b>Leucocyte Differentiation</b>			
Neutrophils	* 17.23	G/l	1.40 – 8.00
Monocytes	* 1.04	G/l	0.16 – 0.95
Eosinophils	0.03	G/l	0.00 – 0.70
Basophils	0.06	G/l	0.00-0.15
Lymphocytes	1.59	G/l	1.50 - 4.00
IG abs.	* 0.18	G/l	0.00 – 0.03
IG %	* 0.9	%	0.0 – 0.05
NRBC abs.	0.01	G/l	
NRBC	0.0	/100 Lc	



**Findings HAD MQ 2020-4 H3A**



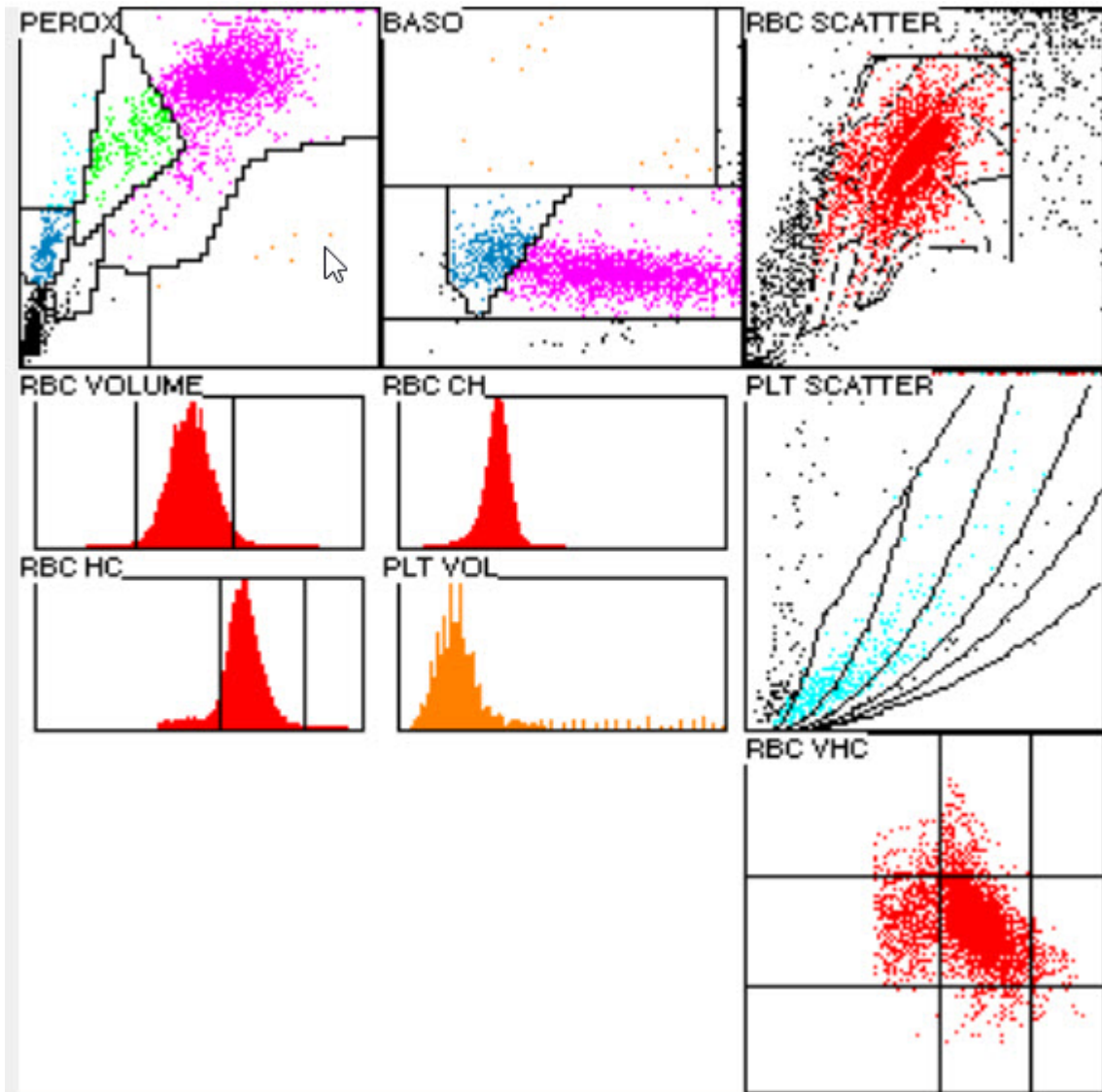
## 1.6 ADVIA 2120



### Findings HAD MQ 2020-4 H3A

70 year old woman

Analysis	Result	Unit	Reference value
<b>Blood Count</b>			
<u>Hemoglobin</u>	139	g/l	117-153
<u>Hematocrit</u>	0.424	l/l	0.35-0.46
Erythrocytes	4.46	T/l	3.9-5.2
MCV	95.1	fl	80-100
MCH	31.1	pg	26-34
MCHC	327	g/l	310-360
Mikrocytes	0.7	%	0-2.0
Macrocytes	* 2.9	%	0-2.0
Hypochromic Ec	* 10.1	%	0-2.0
Hyperchromic Ec	0.5	%	0-2.0
RDW	14.8	%	11.0-14.8
<u>Thrombocytes</u>	226	G/l	143-400
Vd. L-SHIFT	+	+	Keine (0)
<u>Leucocytes</u>	* 18.74	G/l	3.0-9.6
<b>Leucocyte Differentiation</b>			
Neutrophils	* 16.18	G/l	1.40-8.00
Monocytes	0.88	G/l	0.16-0.95
Eosinophils	0.04	G/l	0.00-0.70
Basophile	0.07	G/l	0.00-0.15
Lymphocytes	* 1.42	G/l	1.50-4.00
LUC	0.16	%	0.0-4.0



## 1.7 Differential Blood Smear

### Findings HAD MQ 2020-4 H3A

70 year old woman

Analysis		Result	Unit	Reference value
Neutrophils total	*	17.26	G/l	1.40-8.00
Monocytes		0.49	G/l	0.16-0.95
Eosinophils		0.00	G/l	0.00-0.70
Basophils		0.00	G/l	0.00-0.15
Lymphocytes		1.86	G/l	1.50-4.00
Neutrophils total	*	88.0	%	40.0-74.0
Neutrophils Band		12.5	%	0.0-20.0
Neutrophils Segmented	*	75.5	%	30.0-50.0
Monocytes	*	2.5	%	3.4-9.0
Eosinophils		0.0	%	0.0-7.0
Basophils		0.0	%	0.0-1.5
Lymphocytes	*	9.5	%	19.0-48.0
Plasmacells		0.0	%	0-0.5
Blasts		0.0	%	0
Promyelocytes		0.0	%	0
Myelocytes		0.0	%	0
Metamyelocytes		0.0	%	0
Nucleated Red Cells		0.0	%	0

### Commentary

Differentiation PB - smear 1/400; morphologically little evidence of EDTA artifacts detectable. Normochromic, slightly anisocytic red blood count with few macrocytes. Mild poikilocytosis with few acanthocytes and few echinocytes. Absolute neutrophilia; neutrophil granulocytes with slightly coarsened cytoplasmic granulation, few with fine basophilic streaks and cytoplasmic vacuoles. Many lymphocytes atypically slightly reactively altered. Single cells in apoptosis detectable on transillumination. Slight anisocytosis of the partially hypogranular platelets, individual megakaryocyte nucleus remnants can be seen.

Dr.J.-D. Studt/ Dr. S. Balabanov

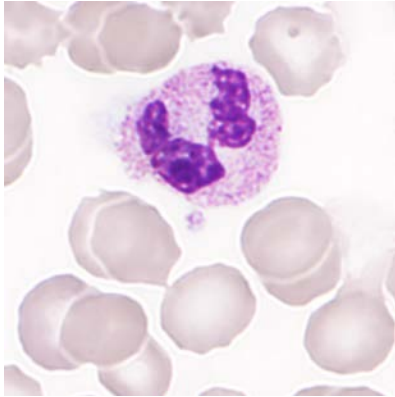


Abb 1. Neutrophile (Seg)

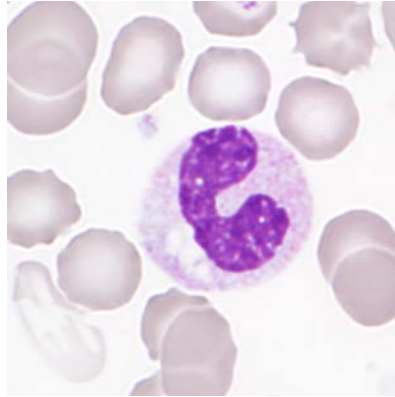


Abb 2. Neutrophile (band)

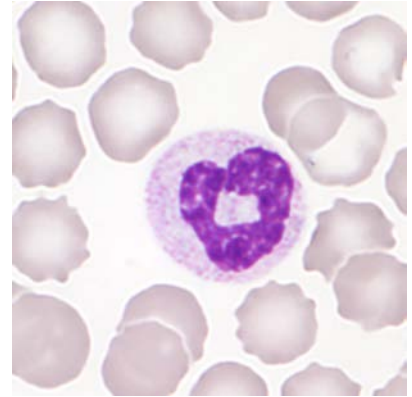


Abb 3. Neutrophile (band)

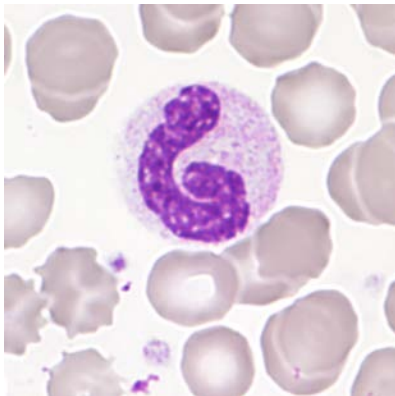


Abb 4. Neutrophile (band)

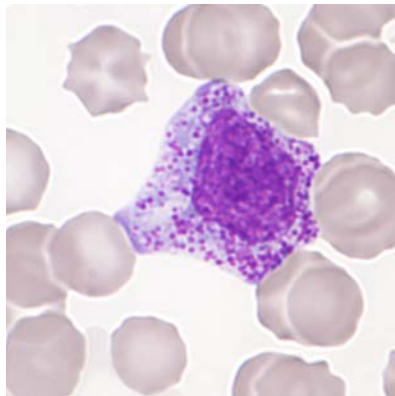


Abb 5. Myelocyte

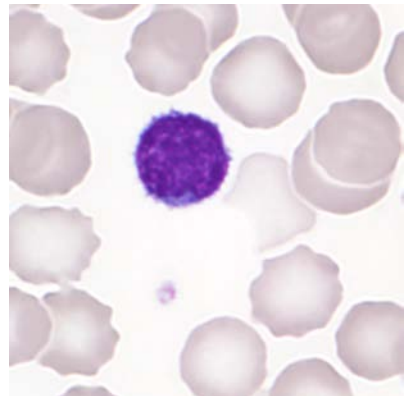


Abb 6. Lymphocyte

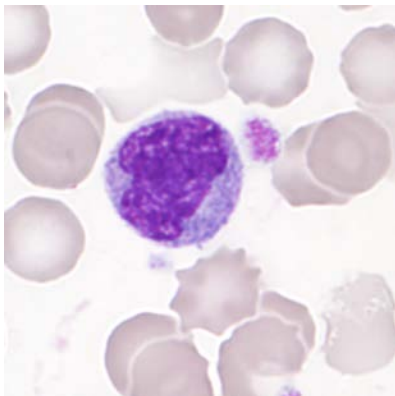


Abb 7. Lymphocyte

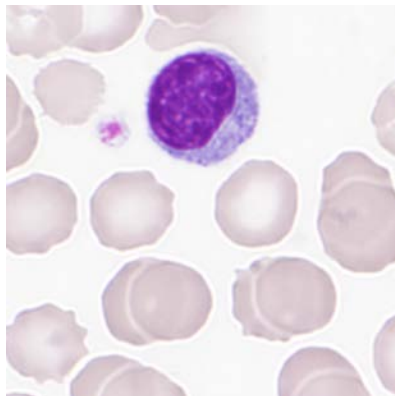


Abb 8. Lymphocyte

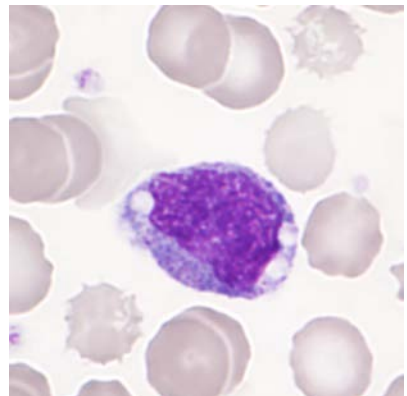


Abb 9. Lymphocyte

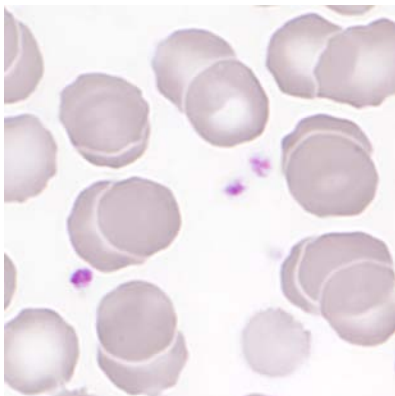


Abb 10. Ec/Tc

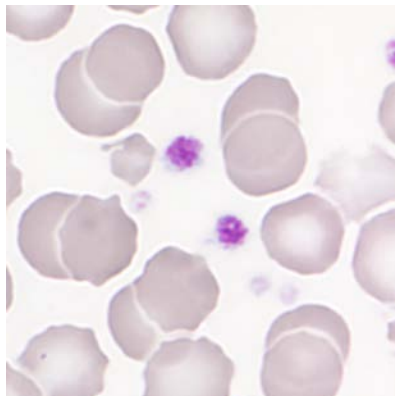


Abb 11. Ec/Tc

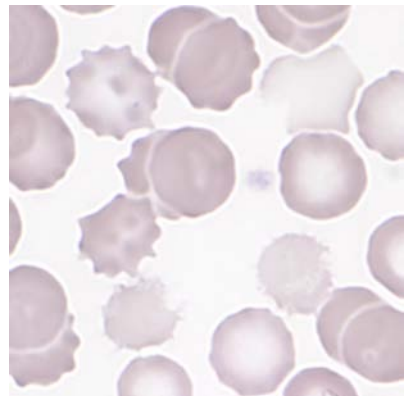


Abb 12. Ec/Tc

## 1.8 Summary of participant results

### Leukocyte Differenzial H3-A

	0	1-4	5-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	>79
<i>Neutrophils Band</i>		10	31	87	59	24	5	1	1		
<i>Neutrophils Segmented.</i>		1			1	5	9	42	81	63	16
<i>Eosinophils</i>	180	37	1								
<i>Basophile</i>	178	40									
<i>Monocytes</i>	25	140	52	1							
<i>Lymphocytes</i>		2	69	145	2						
<i>Plasmacells</i>	215	3									
<i>Blasts</i>	216	2									
<i>Promyelocytes</i>	218	0									
<i>Myelocytes</i>	197	20		1							
<i>Metamyelocyten</i>	198	20									
<i>Erythrocytes Nucleated</i>	211	7									
<i>Unknown</i>	213	5									
<i>Smudge cells</i>	198	11	7	1					1		

### Evaluation H3-A

	light	medium	strong		light	medium	strong
<i>Hypersegmentation</i>	17	5	2	<i>Hypochromic Ec</i>	13	9	2
<i>Pelger-Hüet Anomaly</i>	5	1	0	<i>Polychromatic Ec</i>	23	1	1
<i>Coarse Granulation</i>	83	33	3	<i>Anisocytes</i>	121	17	1
<i>Basophilic Stripling</i>	20	2	0	<i>Mikrocytes</i>	45	3	0
<i>Vacuoles</i>	85	23	2	<i>Makrocytes</i>	26	5	1
<i>Reaktive Lymphocytes</i>	27	3	1	<i>Megalocytes</i>	2	1	0
<i>Atypical Lymphocytes</i>	1	0	1	<i>Poikilocytosis</i>	76	12	1
<i>Others</i>	0	0	0	<i>Ovalocytes</i>	14	2	0
				<i>Target Cells</i>	7	0	0
				<i>Akanthocytes</i>	44	18	3
<i>Anisocytosis</i>	70	13	2	<i>Echinocytes</i>	51	49	12
<i>Megakaryocyte Nucleaus</i>	4	0	0	<i>Sickle Cells</i>	0	0	0
<i>Granulation</i>	13	4	0	<i>Fragmentocytes</i>	31	0	0
<i>Others</i>	1	0	0	<i>Spherocytes</i>	3	1	0
				<i>Stomatocytes</i>	30	1	0
				<i>Basophilic Stripling</i>	5	0	0
				<i>Howell-Jolly Bodies</i>	2	0	0
				<i>Pappenheim Bodies</i>	1	1	0
				<i>Others</i>	3	0	1

### Commentary

The smear comes from a patient with leukocytosis due to myocardial infarction.

## 1.9 Qualab Codes

Summary of the participant codes  
(Bold printed: expected codes)

Code	Text	Number
<b>31</b>	<b>Pathologic findings</b>	<b>95</b>
<b>4</b>	<b>Neutrophils, Toxic Changes</b>	<b>88</b>
<b>2</b>	<b>Neutrophils, left shift</b>	<b>80</b>
<b>30</b>	<b>Pathologic findings, refer to expert</b>	<b>50</b>
<b>16</b>	<b>Poikilocytosis</b>	<b>44</b>
<b>29</b>	<b>Normal findings</b>	<b>44</b>
27	Erythrocytes, other	24
1	Neutrophils, hypersegmentation of nucleus	18
12	Microcytes	18
20	Fragmentocytes	17
5	Atypical lymphocytes, probably reactive	15
13	Macrocytes	15
9	Macrothrombocytes	13
14	Hypochromic Erythrocytes	12
15	Polychromatophilic Red Cells	9
18	Stomatocytes	9
22	Rouleaux	8
11	Thrombocytes, others	7
8	Leucocytes other:	5
17	Elliptocytes/Ovalocytes	5
3	Pelger Hüet Anomaly	3
24	Howell-Jolly bodies	3
25	Basophilic strippling	2
19	Targetcells	1
21	Spherocytes	1
26	Teardrops	1
<b>99</b>	<b>Total</b>	<b>208</b>

## 2 Sample B

### 2.1 ABX Microsemi CRP



#### Findings MQ 2020-4 H3B

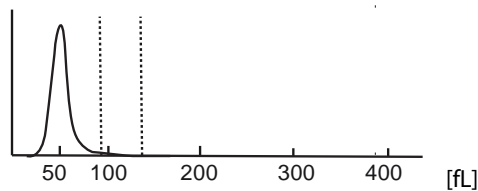
74 year old man

WBC :	36.1	H	10 <sup>9</sup> /L	MCV :	95.5	fL
RBC :	2.82	L	10 <sup>12</sup> /L	MCH :	31.2	pg
HGB :	8.8	L	g/L	MCHC:	32.7	g/L
HCT :	26.9	L	L/L	RDW :	16.8	%
PLT :	243		10 <sup>3</sup> /L	MPV :	7.6	fL
PCT :	0.185		%	PDW :	14.7	%

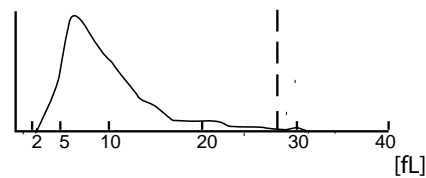
#### WBC FLAGS:

%LYM:	88.7	H	%	#LYM:	32.0	H	10 <sup>9</sup> /L
%MON:	3.1	L	%	#MON:	1.1	H	10 <sup>9</sup> /L
%GRA:	8.2	L	%	#GRA:	3.0		10 <sup>9</sup> /L

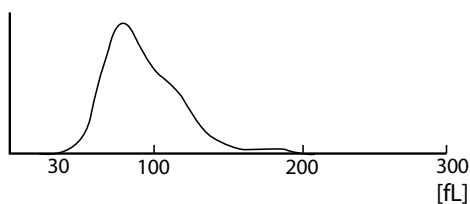
#### WBC



#### PLT



#### RBC





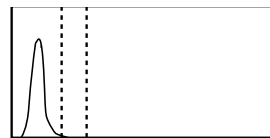
## 2.2 Mythic



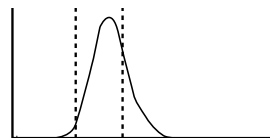
### Findings MQ 2020-4 H3B

74 year old man

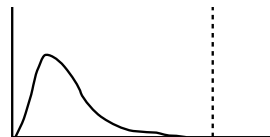
WBC	36.0	H	10 <sup>9</sup> /l	3.5	/	10.0
LYM	30.5	H	10 <sup>9</sup> /l	1.2	/	3.2
MON	2.3	H	10 <sup>9</sup> /l	0.1	/	1.0
GRA	3.1		10 <sup>9</sup> /l	1.2	/	6.8
LYM%	84.8	H	%	17.0	/	48.0
MON%	6.5		%	2.0	/	10.0
GRA%	8.7	L	%	43.0	/	76.0



RBC	3.03	I	10 <sup>12</sup> /l	4.00	/	5.70
HGB	97	I	g/l	120	/	180
HCT	0.298	I	l/l	0.360	/	0.540
MCV	98.3		fl	80.0	/	100.0
MCH	32.0		pg	26.0	/	34.0
MCHC	326		g/l	310	/	365
RDW	16.3		%	10.0	/	16.0



PLT	213		10 <sup>9</sup> /l	150	/	400
MPV	8.2		fl	7.0	/	11.0
PCT	0.175		cl/l	0.100	/	0.500
PDW	13.9		%	10.0	/	18.0



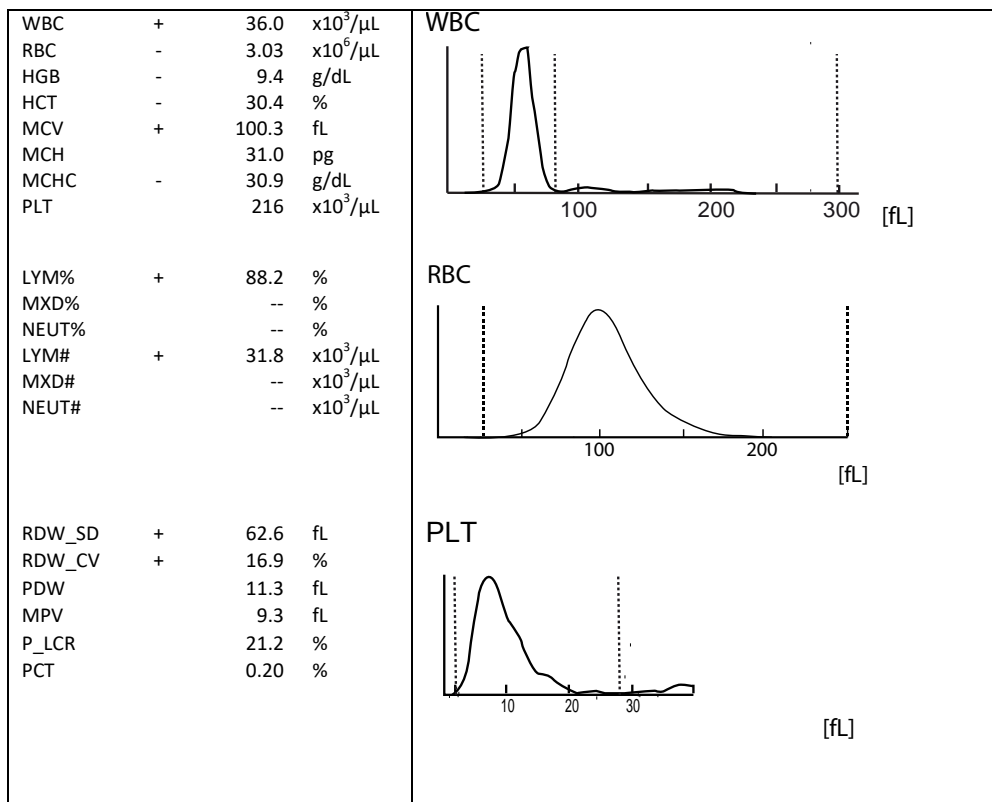
FLAGS : FR2

LEUCOCYTOSIS LYMPHOCYTOSIS MONOCYTOSIS GRANULOPENIA ANEMIA MACROCYTES ANISOCYTOSIS

### 2.3 Sysmex XP300



#### Findings MQ 2020-4 H3B 74 year old man



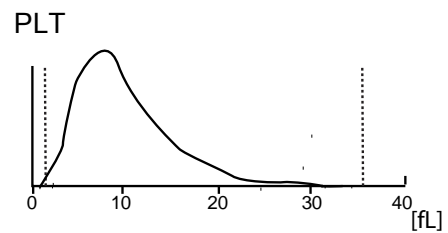
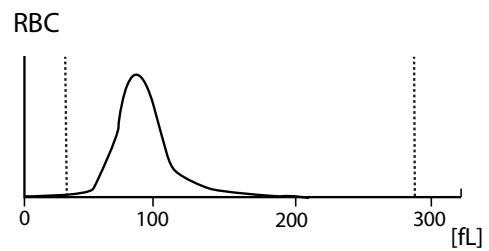
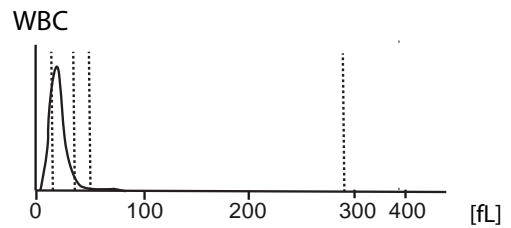
## 2.4 Zybio Z3 CRP



### Findings MQ 2020-4 H3B

74 year old man

WBC	33.63	↑	10 <sup>3</sup> /μl	3.50-9.50
Lym#	29.09	↑	10 <sup>3</sup> /μl	1.10-3.20
Mid#	0.84		10 <sup>3</sup> /μl	0.10-3.20
Gran#	3.70		10 <sup>3</sup> /μl	1.80-6.30
LYM%	86.5	↑	%	20.0-50.0
Mid%	2.5	↓	%	3.0-15.0
GRA%	11.0	↓	%	40.0-75.0
RBC	2.93	↓	10 <sup>6</sup> /μl	3.80-5.80
HGB	9.3	↓	g/dl	11.5-17.5
HCT	28.5	↓	%	35.0-50.0
MCV	97.3		fl	82.0-100.0
MCH	31.8		pg	27.0-34.0
MCHC	32.7		g/dl	31.6-35.4
RDW-CV	16.9	↑	%	11.5-16.0
RDW-SD	56.3	↑	fL	35.0-56.0
PLT	231		10 <sup>3</sup> /μl	125-350
MPV	8.5		fl	6.5-12.0
PDW	16.3		fL	9.0-17.0
PCT	0.197		%	0.108-0.282
P-LCC	43		10 <sup>3</sup> /μl	30-90
P-LCR	18.6		%	11.0-45.0



## 2.5 Sysmex XN-20

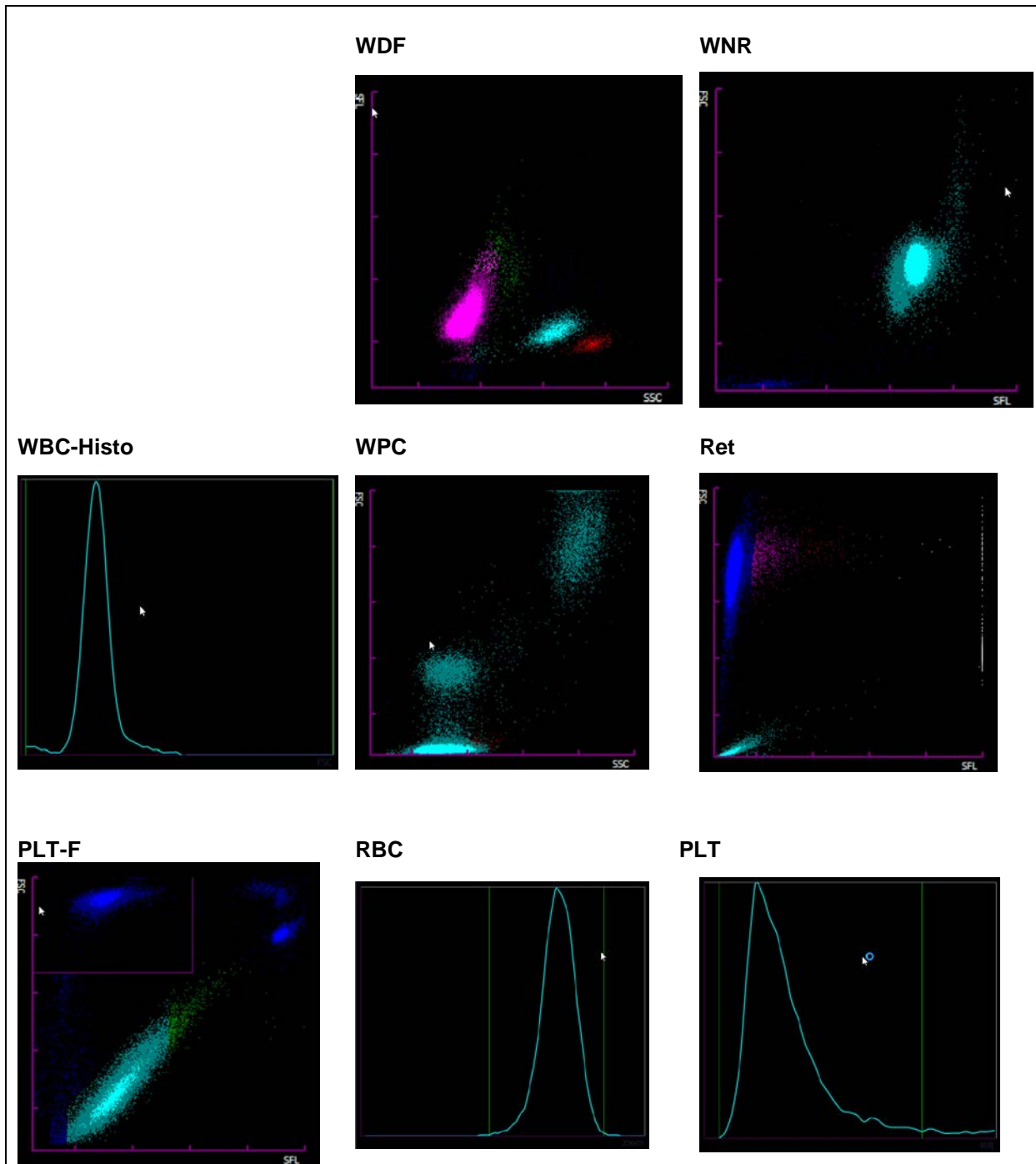


### Findings MQ 2020-4 H3B

74 year old man

Analysis	Result	Unit	Reference value
<b>Blood Count</b>			
Hemoglobin	90	g/l	117-153
Hematocrit	0.291	l/l	0.35-0.46
Erythrocytes	2.96	T/l	3.9-5.2
MCV	98.3	fl	80-100
MCH	30.4	pg	26-34
MCHC	* 309	g/l	310-360
Thrombocytes	219	G/l	143-400
Leucocytes	* 41.45	G/l	3.0-9.6
<b>Leucocyte Differentiation</b>			
Neutrophils	2.68	G/l	1.40-8.00
Monocytes	0.29	G/l	0.16-0.95
Eosinophils	0.45	G/l	0.00-0.70
Basophils	0.05	G/l	0.00-0.15
Lymphocytes	* 37.93	G/l	1.50-4.00
IG abs.	* 0.05	G/l	0.00-0.03
IG %	0.1	%	0.0-0.5
NRBC abs.	0.02	G/l	
NRBC	0.0	/100 Lc	

Findings HAD MQ 2020-4 H3B



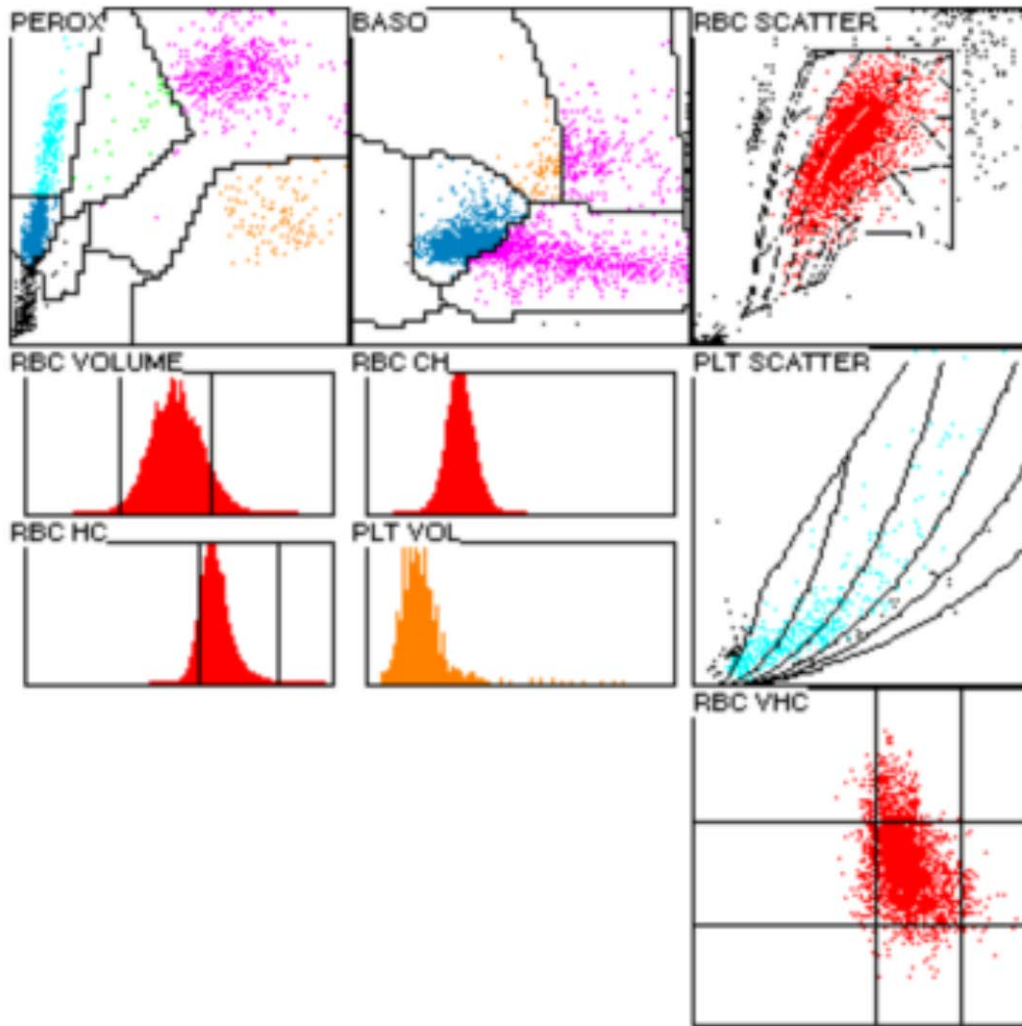
## 2.6 ADVIA 2120



### Findings HAD MQ 2020-4 H3B

74 year old man

Analysis	Result	Unit	Reference value
<b>Blood Count</b>			
Hemoglobin	91	g/l	117-153
Hematocrit	0.305	l/l	0.35-0.46
Erythrocytes	3.11	T/l	3.9-5.2
MCV	98.3	fl	80-100
MCH	29.3	pg	26-34
MCHC	* 298	g/l	310-360
Mikrocytes	1.0	%	0-2.0
Makrocytes	* 8.3	%	0-2.0
Hypochromic Ec	* 10.0	%	0-2.0
Hyerchromic Ec	0.3	%	0-2.0
RDW	* 17.4	%	11.0-0-14.8
Thrombocytes	192	G/l	143-400
Leukocytes	* 39.59	G/l	3.0-9.6
<b>Leucocytes Differentiation</b>			
Neutrophils	2.92	G/l	1.40-8.00
Monocytes	* 0.11	G/l	0.16-0.95
Eosinophils	0.46	G/l	0.00-0.70
Basophils	* 0.33	G/l	0.00-0.15
Lymphocytes	* 34.38	G/l	1.50-4.00
LUC	* 1.38	%	0.0-4.0



## 2.7 Differential Blood Smear

### Findings MQ 2020-4 H3B

74 year old man

Analysis		Result	Unit	Reference value
<b>Leucocytes Differentiation</b>				
Neutrophils total		2.77	G/l	1.40-8.00
Monocytes	*	0.00	G/l	0.16-0.95
Eosinophils	*	1.39	G/l	0.00-0.70
Basophils		0.00	G/l	0.00-0.15
Lymphocytes	*	35.43	G/l	1.50-4.00
Neutrophils total	*	7.0	%	40.0-74.0
Neutrophils Band		3.0	%	0.0-20.0
Neutrophils Segmented	*	4.0	%	30.0-50.0
Monocytes	*	0.0	%	3.4-9.0
Eosinophils		3.5	%	0.0-7.0
Basophils		0.0	%	0.0-1.5
Lymphocytes	*	89.5	%	19.0-48.0
Plasmacells		0.0	%	0-0.5
Blasts		0.0	%	0
Promyelocytes		0.0	%	0
Myelocytes		0.0	%	0
Metamyelocytes		0.0	%	0
Others/ damaged cells		0.0	%	0

### Commentary

Automatic-flow cytometric-enzymatic cell analysis is not to be used. See microscopic differentiation. Absolute lymphocytosis of 35.43 G/L; lymphocytes atypical presumably neoplastic small, narrowly plasmic partly "naked-nucleated" lymphocytes with oval, partly notched nucleus, dense irregularly condensed nuclear chromatin and few with suggested nucleolus. 2/3 of the lymphocytes are damaged and were differentiated as nuclear shadows integrated. We recommend immunophenotyping/clonality clarification in heparin blood. Neutrophil granulocytes with slightly coarsened cytoplasmic granulation. Hyporegenerative anemia; Slightly hypochromic, slightly anisocytic red blood count with few macrocytes. Slight money roll formation. Marked poikilocytosis with many acanthocytes and 3-5 tear drop shapes in each field of view. Platelets partially hypogranulated.

K. Schreiber / PD. Dr. St. Balabanov



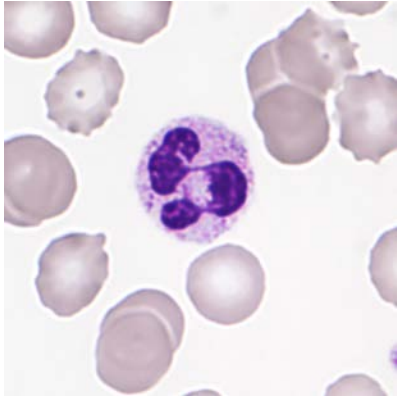


Abb 1. Neutrophil (Seg)

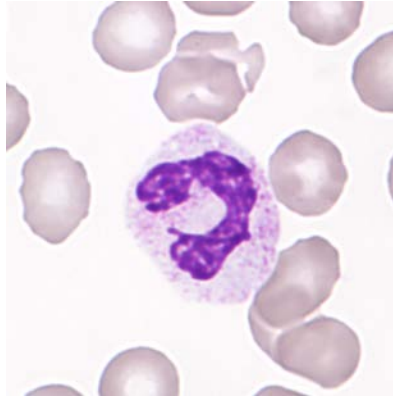


Abb 2. Neutrophil (Band)

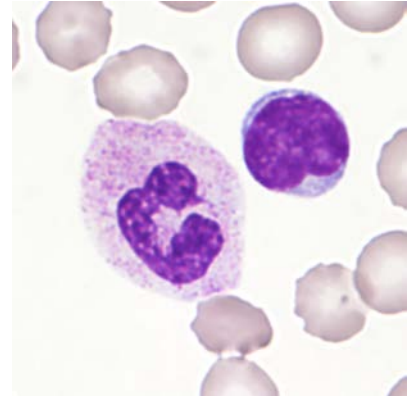


Abb 3. Neutrophil (Band)

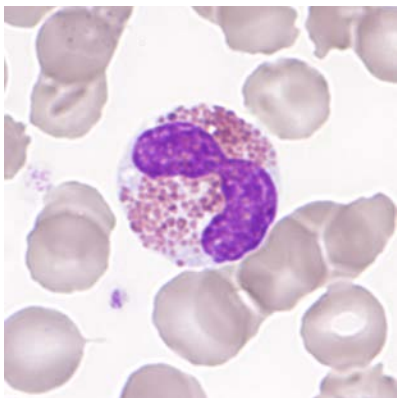


Abb 4. Eosinophile

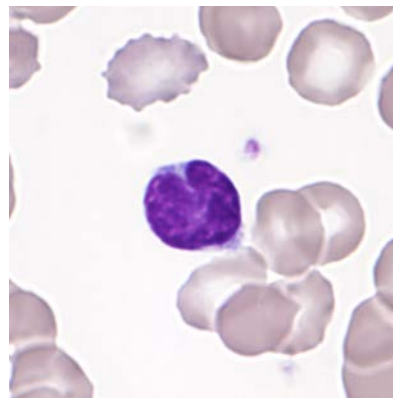


Abb 5. Lymphocyte

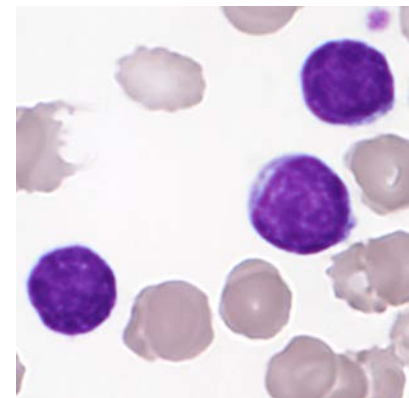


Abb 6. Lymphocyte

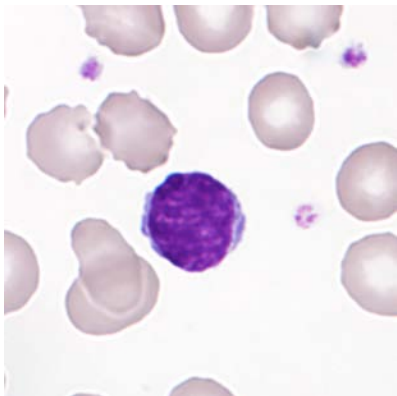


Abb 7. Lymphocyte

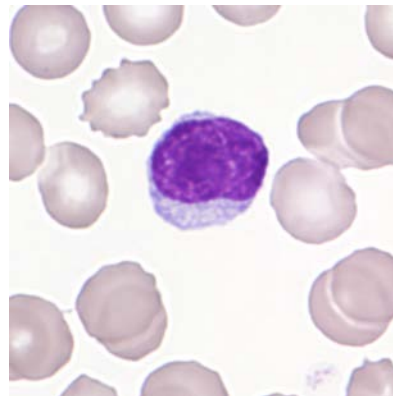


Abb 8. Lymphocyte

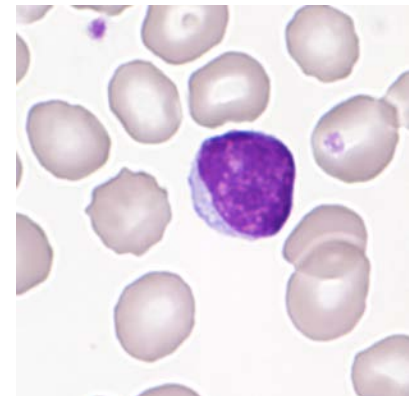


Abb 9. Lymphocyte

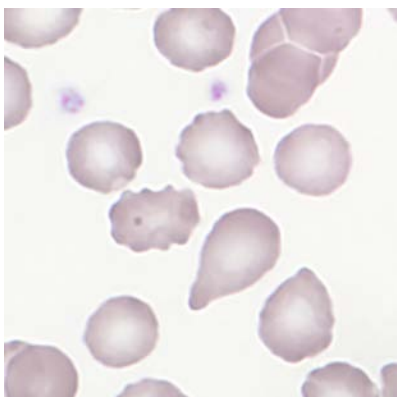


Abb 10. Poikilozytose

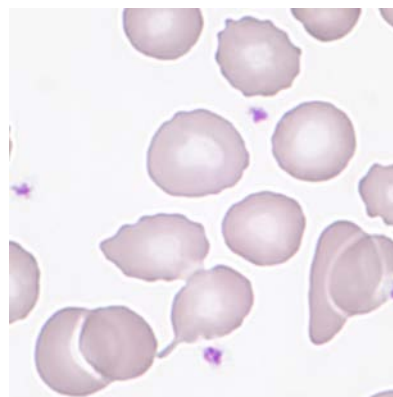


Abb 11. Poikilozytose

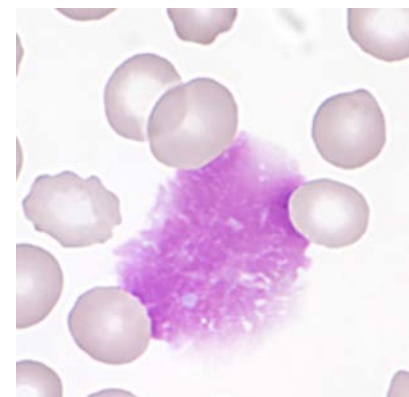


Abb 12. Damaged cell

## 2.8 Summary of participant results

### Leukocyte Differential H3-B

	<1	1-4	5-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	>79
<i>Neutrophils Band</i>	40	147	27	2							
<i>Neutrophils Segmented.</i>	2	68	102	37	6					1	
<i>Eosinophils</i>	71	143	2								
<i>Basophile</i>	197	18	1								
<i>Monocytes</i>	161	54	1								
<i>Lymphocytes</i>	2		1	12	18	40	33	15	11	21	63
<i>Plasmacells</i>	214					1			1		
<i>Blasts</i>	213	1		1							1
<i>Promyelocytes</i>	215	1									
<i>Myelocytes</i>	215	1									
<i>Metamyelozyten</i>	215						1				
<i>Erythrocytes Nucleated</i>	210	6									
<i>Unknown</i>	211	1	1			1		1	1		
<i>Smudge cells</i>	75	1		10	10	14	23	40	25	15	3

### Evaluation H3-B

	light	medium	strong		light	medium	strong
<i>Hypersegmentation</i>	5	1	0	<i>Hypochromic Ec</i>	49	23	5
<i>Pelger-Hüet Anomaly</i>	0	0	0	<i>Polychromatic Ec</i>	29	5	2
<i>Coarse Granulation</i>	45	16	0	<i>Anisocytes</i>	105	39	3
<i>Basophilic Stripling</i>	4	2	0	<i>Mikrocytes</i>	52	18	1
<i>Vacuoles</i>	8	1	0	<i>Makrocytes</i>	32	5	1
<i>Atypical Lymph, reactive</i>	8	1	4	<i>Megalocytes</i>	1	1	0
<i>Atypical Lymph, neoplastic</i>	8	15	31	<i>Poikilocytosis</i>	102	30	0
<i>Others</i>	3	6	12	<i>Ovalocytes</i>	67	2	0
				<i>Target Cells</i>	5	1	0
				<i>Akanthocytes</i>	45	14	1
<i>Anisocytosis</i>	47	9	0	<i>Echinocytes</i>	59	17	3
<i>Megakaryocyte Nucleaus</i>	3	0	0	<i>Sickle Cells</i>	3	0	0
<i>Granulation</i>	6	4	0	<i>Fragmentocytes</i>	26	2	0
<i>Others</i>	0	0	0	<i>Spherocytes</i>	5	0	0
				<i>Stomatocytes</i>	0	0	0
				<i>Basophilic Stripling</i>	26	3	0
				<i>Howell-Jolly Bodies</i>	2	0	0
				<i>Pappenheim Bodies</i>	0	0	0
				<i>Others</i>	19	4	1

### Commentary

The smear is from a patient with a known CLL. The percentage of damaged cells depends on the smear. The target value we have specified for the lymphocytes corresponds to the sum of the lymphocytes and the damaged cells. We have therefore increased the tolerance for the two cell types.

## 2.9 Qualab Codes

Summary of the participant codes  
(Bold printed: expected codes)

Code	Text	Number
<b>30</b>	<b>Pathologic findings, refer to expert</b>	<b>125</b>
<b>6</b>	<b>Atypical lymphocytes, probably neoplastic</b>	<b>76</b>
<b>31</b>	<b>Pathologic findings</b>	<b>76</b>
<b>16</b>	<b>Poikilocytosis</b>	<b>69</b>
<b>8</b>	<b>Leucocytes other:</b>	<b>58</b>
<b>26</b>	<b>Teardrops</b>	<b>37</b>
14	Hypochromic Erythrocytes	36
12	Microcytes	29
17	Elliptocytes/Ovalocytes	17
27	Erythrocytes, other	14
4	Neutrophils, Toxic Changes	11
13	Macrocytes	11
22	Rouleaux	10
25	Basophilic strippling	10
5	Atypical lymphocytes, probably reactive	9
20	Fragmentocytes	9
15	Polychromatophilic Red Cells	8
9	Macrothrombocytes	3
23	Erythrocytes agglutination	2
1	Neutrophils, hypersegmentation of nucleus	1
2	Neutrophils, left shift	1
11	Thrombocytes, others	1
19	Targetcells	1
21	Spherocytes	1
24	Howell-Jolly bodies	1
99	Total	205