

Verein für  
Association pour le  
Associazione per il



medizinische Qualitätskontrolle  
contrôle de qualité médical  
controllo di qualità medico

Report

# Differential Blood Smear H3

MQ 2015-4

## Acknowledgements

The Mythic 18 analyzer was provided by the company Polymed, the ABX Micros CRP 200 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. Jeroen Goede 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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# Index

|          |                                |           |
|----------|--------------------------------|-----------|
| <b>1</b> | <b>SAMPLE A</b>                | <b>4</b>  |
| 1.1      | ABX Micros                     | 4         |
| 1.2      | Mythic                         | 5         |
| 1.3      | Sysmex XP300                   | 6         |
| 1.4      | Sysmex XE-5000                 | 7         |
| 1.5      | ADVIA 2120                     | 9         |
| 1.6      | Differential Blood Smear       | 11        |
| 1.7      | Summary of participant results | 13        |
| 1.8      | Qualab Codes                   | 14        |
| <b>2</b> | <b>SAMPLE B</b>                | <b>15</b> |
| 2.1      | ABX Micros                     | 15        |
| 2.2      | Mythic                         | 16        |
| 2.3      | Sysmex XP300                   | 17        |
| 2.4      | Sysmex XE-5000                 | 18        |
| 2.5      | ADVIA 2120                     | 20        |
| 2.6      | Differential Blood Smear       | 22        |
| 2.7      | Summary of participant results | 24        |
| 2.8      | Qualab Codes                   | 25        |

# 1 Sample A

## 1.1 ABX Micros

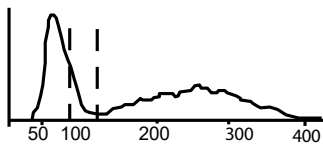


### Findings MQ 2015-4 H3A 35 year old women

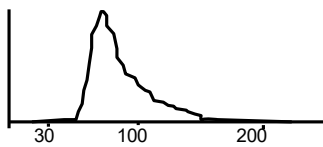
|       |      |                      |       |      |   |     |
|-------|------|----------------------|-------|------|---|-----|
| WBC : | 6.2  | 10 <sup>9</sup> /L   | MCV : | 97.7 | H | fL  |
| RBC : | 4.03 | 10 <sup>12</sup> /L  | MCH : | 33.3 |   | pg  |
| HGB : | 134  | g/L                  | MCHC: | 341  |   | g/L |
| HCT : | 394  | L/L                  | RDW : | 14.5 |   | %   |
| PLT : | 217  | 10 <sup>9</sup> /L   | MPV : | 6.2  | L | fL  |
| PCT : | 135  | 10 <sup>-2</sup> L/L | PDW : | 12.8 |   | %   |

|       |      |   |       |     |                    |
|-------|------|---|-------|-----|--------------------|
| DIFF: |      |   |       |     |                    |
| %LYM: | 37.5 | % | #LYM: | 2.3 | 10 <sup>9</sup> /L |
| %MON: | 7.2  | % | #MON: | 0.4 | 10 <sup>9</sup> /L |
| %GRA: | 55.3 | % | #GRA: | 3.5 | 10 <sup>9</sup> /L |

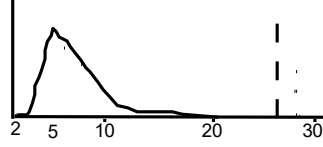
WBC



RBC



PLT

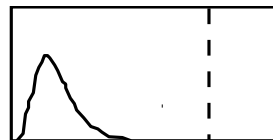
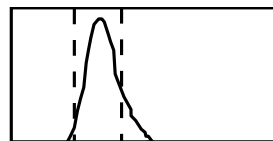


## 1.2 Mythic



### Findings MQ 2015-4, H3A 35 year old women

|      |             |             |         |       |
|------|-------------|-------------|---------|-------|
| WBC  | 6.5         | $10^9/l$    | 3.5 /   | 10.0  |
| LYM  | 2.8         | $10^9/l$    | 1.2 /   | 3.2   |
| MON  | 0.4         | $10^9/l$    | 0.1 /   | 1.0   |
| GRA  | 3.3         | $10^9/l$    | 1.2 /   | 6.8   |
| LYM% | 43.0        | %           | 17.0 /  | 48.0  |
| MON% | 6.0         | %           | 2.0 /   | 10.0  |
| GRA% | 51.0        | %           | 43.0 /  | 76.0  |
| RBC  | <b>3.88</b> | $10^{12}/l$ | 4.00 /  | 5.70  |
| HGB  | 131         | g/l         | 140 /   | 180   |
| HCT  | 0.385       | l/l         | 0.420 / | 0.540 |
| MCV  | 99.2        | fl          | 80.0 /  | 100.0 |
| MCH  | 33.8        | pg          | 26.0 /  | 34.0  |
| MCHC | 340         | g/l         | 310 /   | 365   |
| RDW  | 12.9        | %           | 10.0 /  | 16.0  |
| PLT  | 209         | $10^9/l$    | 150 /   | 400   |
| MPV  | <b>6.9</b>  | fl          | 7.0 /   | 11.0  |
| PCT  | 0.144       | cl /l       | 0.100 / | 0.500 |
| PDW  | 12.3        | %           | 10.0 /  | 18.0  |



### 1.3 Sysmex XP300



**Findings MQ 2015-4 H3A**  
35 year old women

|        |       |                     |  |
|--------|-------|---------------------|--|
| WBC    | 6.3   | 10 <sup>3</sup> /μL |  |
| RBC    | -3.98 | 10 <sup>6</sup> /μL |  |
| HGB    | 132   | g/L                 |  |
| HCT    | 0.38  | L/L                 |  |
| MCV    | +95.5 | fL                  |  |
| MCH    | +33.2 | pg                  |  |
| MCHC   | 347   | g/L                 |  |
| PLT    | 237   | 10 <sup>3</sup> /μL |  |
| LYM%   | +45.2 | %                   |  |
| MXD%   | 9.3   | %                   |  |
| NEUT%  | -45.5 | %                   |  |
| LYM#   | 2.8   | 10 <sup>3</sup> /μL |  |
| MXD#   | 0.6   | 10 <sup>3</sup> /μL |  |
| NEUT#  | 2.9   | 10 <sup>3</sup> /μL |  |
| RDW_SD | +47.4 | fL                  |  |
| RDW_CV | 12.8  | %                   |  |
| PDW    | 9.4   | fL                  |  |
| MPV    | 8.1   | fL                  |  |
| P_LCR  | -10.6 | %                   |  |
| PCT    | 0.19  | %                   |  |

## 1.4 Sysmex XE-5000

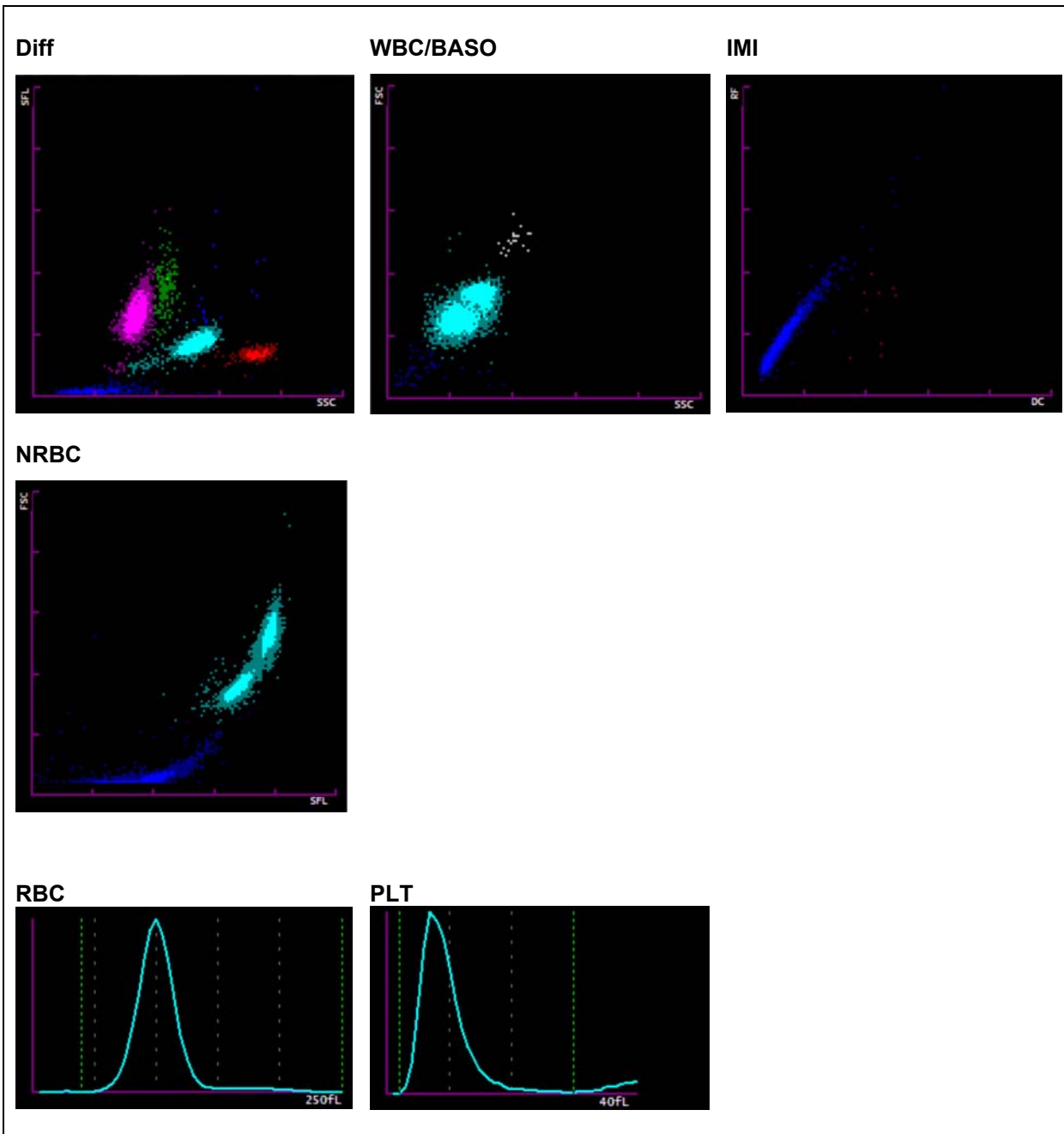


### Findings HAD MQ 2015-4 H3A

25 year old women

| Analysis                         | Result | Unit    | Reference value |
|----------------------------------|--------|---------|-----------------|
| <b>Blood Count</b>               |        |         |                 |
| <u>Hemoglobin</u>                | 130    | g/l     | 117-153         |
| <u>Hematocrit</u>                | 0.392  | l/l     | 0.350-0.460     |
| Erythrocytes                     | 3.96   | T/l     | 3.9-5.2         |
| MCV                              | 99.0   | fl      | 80-100          |
| MCH                              | 32.8   | pg      | 26-34           |
| MCHC                             | 332    | g/l     | 310-360         |
| Mikrocytes                       | 13.6   | %       | 11.0-14.8       |
| <u>Thrombocytes</u>              | 237    | G/l     | 143-400         |
| <u>Leucocytes</u>                | 6.67   | G/l     | 3.0-9.6         |
| <b>Leucocyte Differentiation</b> |        |         |                 |
| Neutrophils                      | 2.90   | G/l     | 1.40-8.00       |
| Monocytes                        | 0.34   | G/l     | 0.16-0.95       |
| Eosinophils                      | 0.52   | G/l     | 0.00-0.70       |
| Basophils                        | 0.02   | G/l     | 0.00-0.15       |
| Lymphocytes                      | 2.89   | G/l     | 1.50-4.00       |
| IG abs.                          | 0.01   | G/l     | 0.00-0.03       |
| IG %                             | 0.1    | %       | 0.0-0.5         |
| NRBC abs.                        | 0.06   | G/l     |                 |
| NRBC                             | 0.9    | /100 Lc |                 |

**Findings HAD MQ 2015-4 H3A**



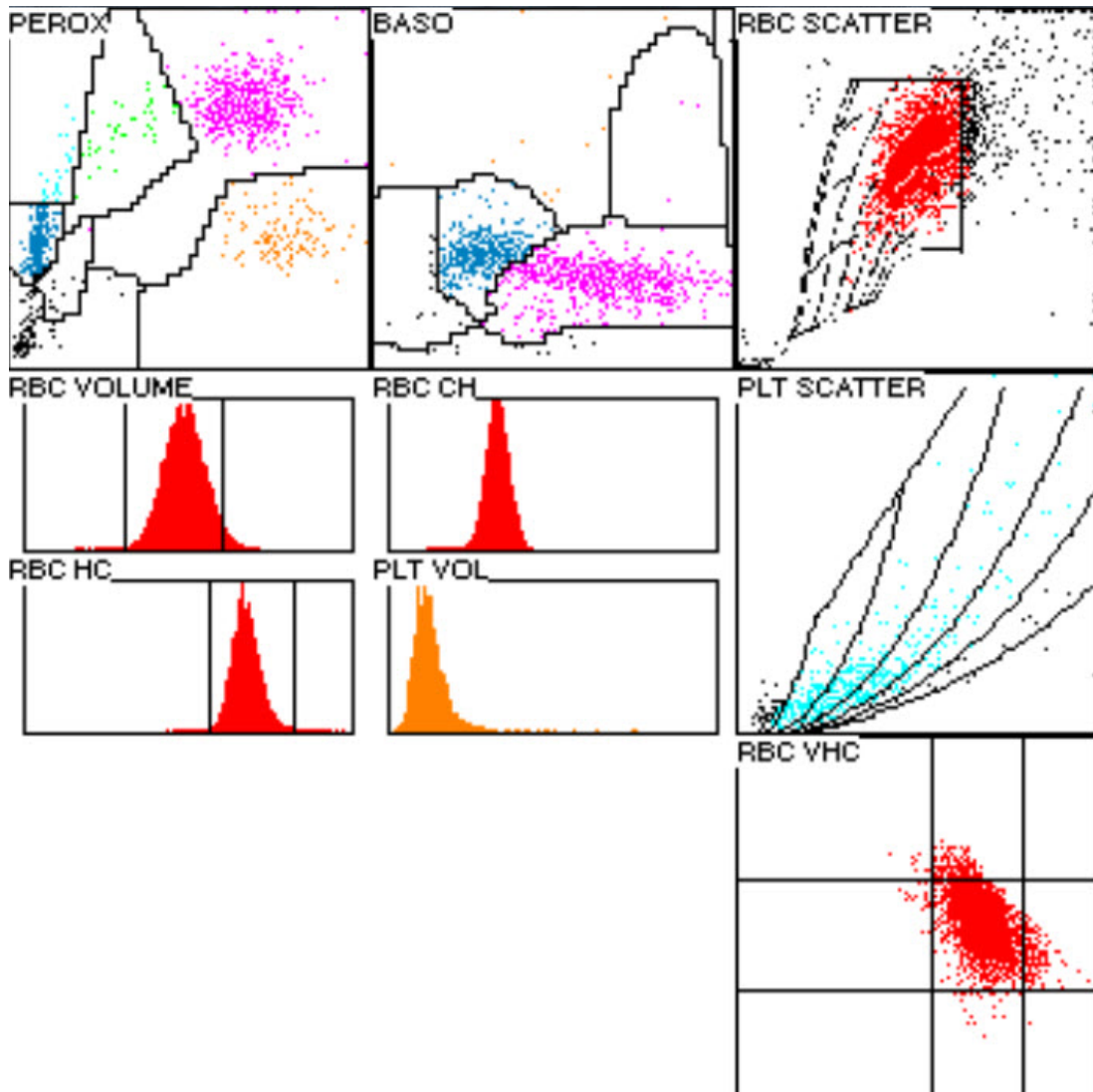


## 1.5 ADVIA 2120



### Findings HAD MQ 2015-4 H3A 35 year old women

| Analysis                         | Result | Unit | Reference value |
|----------------------------------|--------|------|-----------------|
| <b>Blood Count</b>               |        |      |                 |
| <u>Hemoglobin</u>                | 129    | g/l  | 117-153         |
| <u>Hematocrit</u>                | 0.382  | l/l  | 0.350-0.460     |
| Erythrocytes                     | 3.91   | T/l  | 3.9-5.2         |
| MCV                              | 97.6   | fl   | 80-100          |
| MCH                              | 32.9   | pg   | 26-34           |
| MCHC                             | 337    | g/l  | 310-360         |
| Mikrocytes                       | 0.1    | %    | 0-2.0           |
| Makrocytes                       | * 2.9  | %    | 0-2.0           |
| Hypochromic Ec                   | 0.4    | %    | 0-2.0           |
| Hyperchromic Ec                  | 0.4    | %    | 0-2.0           |
| RDW                              | 12.9   | %    | 11.0-14.8       |
| <u>Thrombozyten</u>              | 224    | G/l  | 143-400         |
| Vd. L-SHIFT                      | 0      | +    | Keine (0)       |
| <u>Leucocytes</u>                | 6.49   | G/l  | 3.0-9.6         |
| <b>Leucocyte differentiation</b> |        |      |                 |
| Neutrophils                      | 2.84   | G/l  | 1.40-8.00       |
| Monocytes                        | 0.24   | G/l  | 0.16-0.95       |
| Eosinophils                      | 0.53   | G/l  | 0.00-0.70       |
| Basophils                        | 0.04   | G/l  | 0.00-0.15       |
| Lymphocytes                      | 2.75   | G/l  | 1.50-4.00       |
| LUC                              | 1.7    | %    | 0.0-4.0         |



## 1.6 Differential Blood Smear

### Findings HAD MQ 2015-4 H3A

35 year old women

| Analysis              | Result | Unit    | Reference value |
|-----------------------|--------|---------|-----------------|
| Neutrophils total     | 2.95   | G/l     | 1.40-8.00       |
| Monocytes             | 0.19   | G/l     | 0.16-0.95       |
| Eosinophils           | 0.45   | G/l     | 0.00-0.70       |
| Basophils             | 0.03   | G/l     | 0.00-0.15       |
| Lymphocytes           | 2.86   | G/l     | 1.50-4.00       |
| Neutrophils total     | 45.5   | %       | 40.0-74.0       |
| Neutrophils Band      | 9.0    | %       | 0.0-20.0        |
| Neutrophils Segmented | 36.5   | %       | 30.0-50.0       |
| Monocytes             | * 3.0  | %       | 3.4-9.0         |
| Eosinophils           | 7.0    | %       | 0.0-7.0         |
| Basophils             | 0.5    | %       | 0.0-1.5         |
| Lymphocytes           | 44.0   | %       | 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   |        | /100 Lc |                 |

### Commentary

The red blood picture is normochromic and normocytic. There are no erythrocytic inclusions detectable. Neutrophil granulocytes with fine cytoplasmic granulation. The lymphocytes are polymorphic in terms of size and nuclei, <10% with azurophilic granulation. Platelet anisocytosis is minor. No giant forms detectable.

K. Schreiber/ Dr. J. Goede

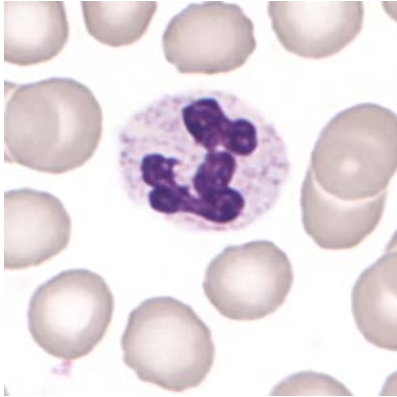


Abb 1. Neutrophil (Seg)

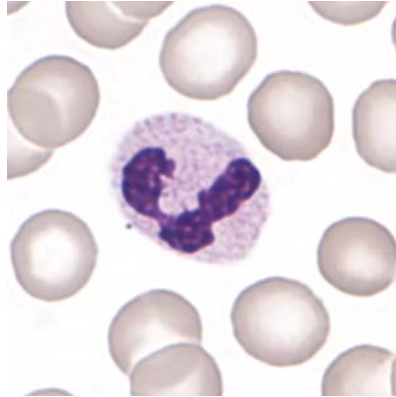


Abb 2. Neutrophil (Seg)

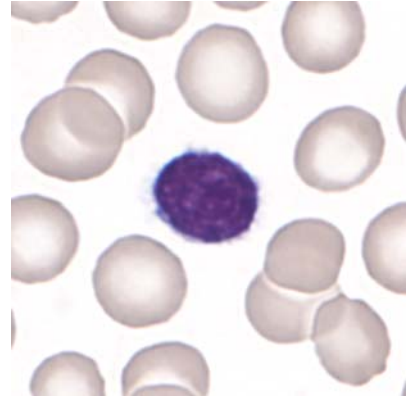


Abb 3 Lymphocyte

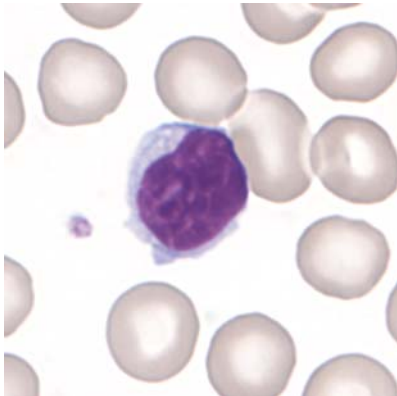


Abb 4. Lymphocyte

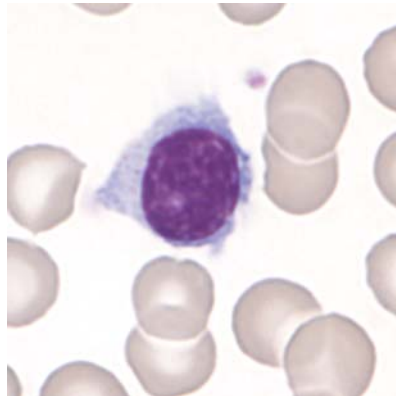


Abb 5. Lymphocyte

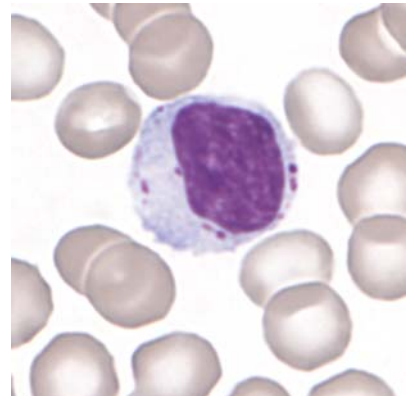


Abb 6. Lymphocyte (LGL)

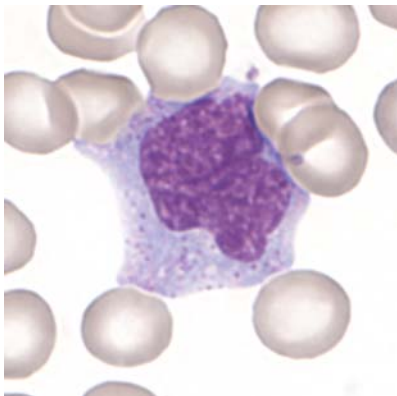


Abb 7. Monocyte

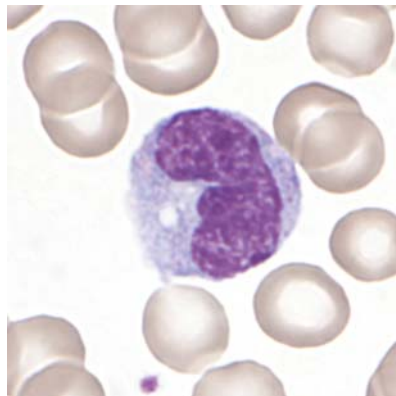


Abb 8. Monocyte

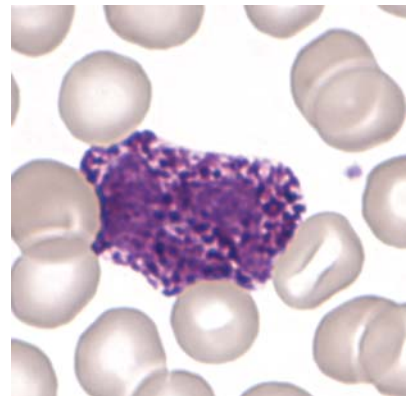


Abb 9. Basophile

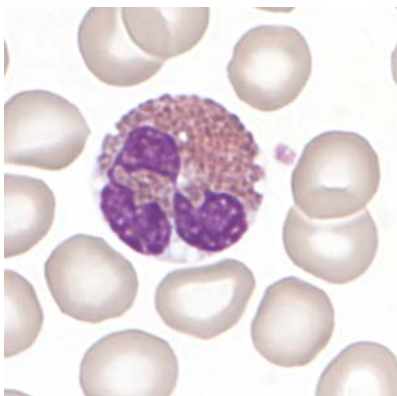


Abb 10. Eosinophile

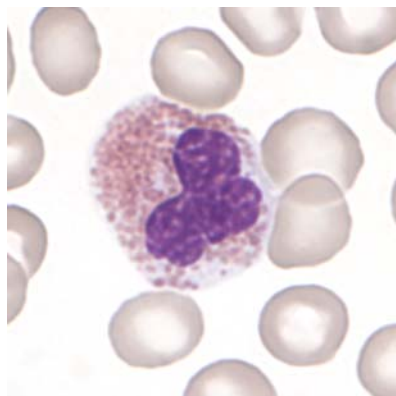


Abb 11. Eosinophile

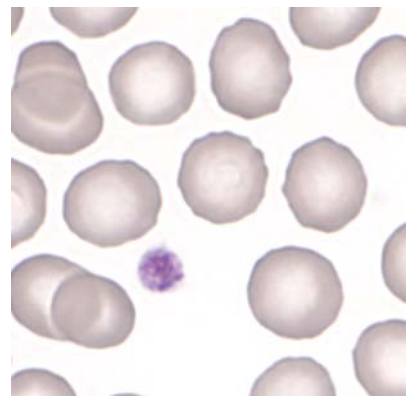


Abb 12. Thrombocyte

## 1.7 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>       | 3    | 40   | 112* | 154   | 28    | 4     | 3     |       |       |       |     |
| <i>Neutrophils Segmented.</i> | 2    |      | 3    | 8     | 100   | 180*  | 44    | 7     |       |       |     |
| <i>Eosinophils</i>            | 9    | 90   | 219* | 26    |       |       |       |       |       |       |     |
| <i>Basophile</i>              | 229* | 113  | 1    |       | 1     |       |       |       |       |       |     |
| <i>Monocytes</i>              | 36   | 256* | 49   | 2     | 1     |       |       |       |       |       |     |
| <i>Lymphocytes</i>            |      |      |      |       | 128   | 226*  | 83    | 6     |       |       |     |
| <i>Plasmacells</i>            | 338* | 5    | 1    |       |       |       |       |       |       |       |     |
| <i>Blasts</i>                 | 342* |      | 2    |       |       |       |       |       |       |       |     |
| <i>Promyelocytes</i>          | 344* |      |      |       |       |       |       |       |       |       |     |
| <i>Myelocytes</i>             | 341* | 2    | 1    |       |       |       |       |       |       |       |     |
| <i>Metamyelocyten</i>         | 341* | 3    |      |       |       |       |       |       |       |       |     |
| <i>Erythrocytes</i>           | 343* | 1    |      |       |       |       |       |       |       |       |     |
| <i>Unknown</i>                | 334* | 8    | 1    | 1     |       |       |       |       |       |       |     |
| <i>Smudge cells</i>           | 325* | 17   | 2    |       |       |       |       |       |       |       |     |

### Evaluation H3-A

|                                  | light | medium | strong |                             | light | medium | strong |
|----------------------------------|-------|--------|--------|-----------------------------|-------|--------|--------|
| <i>Nuclear-hypersegmentation</i> | 9     | 3      |        | <i>Hypochromic Ec</i>       | 53    | 8      | 2      |
| <i>Pelger-Hüet Anomaly</i>       |       |        |        | <i>Polychromatic Ec</i>     | 23    | 8      |        |
| <i>Coarse Granulation</i>        | 46    | 10     |        | <i>Anisocytes</i>           | 138   | 15     | 1      |
| <i>Basophilic Stripping</i>      | 10    | 1      |        | <i>Mikrocytes</i>           | 44    | 5      |        |
| <i>Vacuoles</i>                  | 15    | 1      | 1      | <i>Makrocytes</i>           | 50    | 2      |        |
| <i>Reaktive Lymphocytes</i>      | 61*   | 8      | 4      | <i>Megalocytes</i>          | 6     |        |        |
| <i>Atypical Lymphocytes</i>      | 13    | 1      |        | <i>Poikilocytosis</i>       | 45    | 6      |        |
| <i>Others</i>                    | 12    | 3      | 1      | <i>Ovalocytes</i>           | 42    | 1      |        |
|                                  |       |        |        | <i>Target Cells</i>         | 20    |        |        |
|                                  |       |        |        | <i>Akanthocytes</i>         | 11    |        |        |
| <i>Anisocytosis</i>              | 60*   | 14     | 2      | <i>Echinocytes</i>          | 20    | 5      |        |
| <i>Megakaryocyte Nucleaus</i>    | 9     | 1      |        | <i>Sickle Cells</i>         | 2     |        |        |
| <i>Granulation</i>               | 9     | 2      |        | <i>Fragmentocytes</i>       | 5     |        |        |
| <i>Others</i>                    |       |        |        | <i>Spherocytes</i>          | 6     |        |        |
|                                  |       |        |        | <i>Stomatocytes</i>         | 5     |        |        |
|                                  |       |        |        | <i>Basophilic Stripping</i> | 9     | 1      |        |
|                                  |       |        |        | <i>Howell-Jolly Bodies</i>  | 7     |        |        |
|                                  |       |        |        | <i>Pappenheim Bodies</i>    | 1     |        |        |
|                                  |       |        |        | <i>Others</i>               | 4     |        |        |
|                                  |       |        |        |                             |       |        |        |

\* Target Value

## 1.8 Qualab Codes

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

| Code      | Text                                           | Number     |
|-----------|------------------------------------------------|------------|
| <b>29</b> | <b>Normal findings</b>                         | <b>226</b> |
| <b>30</b> | <b>Pathologic findings, refer to expert</b>    | <b>56</b>  |
| <b>5</b>  | <b>Atypical lymphocytes, probably reactive</b> | <b>48</b>  |
| <b>31</b> | <b>Pathologic findings</b>                     | <b>35</b>  |
| <b>8</b>  | <b>Leucocytes other:</b>                       | <b>34</b>  |
| 14        | Hypochromic Erythrocytes                       | 21         |
| 13        | Macrocytes                                     | 20         |
| 16        | Poikilocytosis                                 | 20         |
| 2         | Neutrophils, left shift                        | 16         |
| 15        | Polychromatophilic Red Cells                   | 15         |
| 12        | Microcytes                                     | 14         |
| 22        | Rouleaux                                       | 13         |
| 6         | Atypical lymphocytes, probably neoplastic      | 12         |
| 27        | Erythrocytes, other                            | 12         |
| 4         | Neutrophils, Toxic Changes                     | 9          |
| 9         | Macrothrombocytes                              | 9          |
| 26        | Teardrops                                      | 9          |
| 17        | Elliptocytes/Ovalocytes                        | 8          |
| 19        | Targetcells                                    | 8          |
| 10        | Thrombocyte aggregates                         | 6          |
| 25        | Basophilic strippling                          | 5          |
| 1         | Neutrophils, hypersegmentation of nucleus      | 4          |
| 11        | Thrombocytes, others                           | 4          |
| 24        | Howell-Jolly bodies                            | 3          |
| 21        | Spherocytes                                    | 2          |
| 3         | Pelger Hüet Anomaly                            | 1          |
| 18        | Stomatocytes                                   | 1          |
| 20        | Fragmentocytes                                 | 1          |
| 23        | Erythrocytes agglutination                     | 1          |
| 28        | Parasites                                      | 1          |

## 2 Sample B

### 2.1 ABX Micros



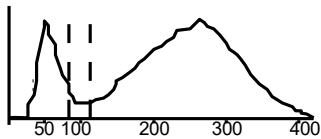
#### Findings MQ 2015-4 H3B

50 year old woman

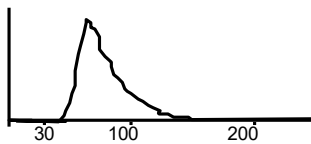
|       |       |   |              |       |      |      |
|-------|-------|---|--------------|-------|------|------|
| WBC : | 12.9  | H | $10^9/L$     | MCV : | 87.2 | fL   |
| RBC : | 3.86  |   | $10^{12}/L$  | MCH : | 28.0 | pg   |
| HGB : | 108   | L | g/L          | MCHC: | 321  | g/L  |
| HCT : | 0.337 | L | L/L          | RDW : | 16.0 | H %  |
| PLT : | 3     | U | $10^9/L$     | MPV : | 6.6  | U fL |
| PCT : | 0.002 | U | $10^{-2}L/L$ | PDW : | 5.1  | U %  |

|       |      |   |   |       |      |            |
|-------|------|---|---|-------|------|------------|
| DIFF: |      |   |   |       |      |            |
| %LYM: | 15.5 | L | % | #LYM: | 2.0  | $10^9/L$   |
| %MON: | 3.7  | L | % | #MON: | 0.4  | $10^9/L$   |
| %GRA: | 80.8 | H | % | #GRA: | 10.5 | H $10^9/L$ |

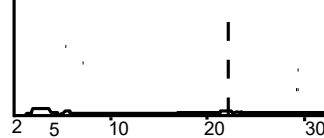
#### WBC



#### RBC



#### PLT



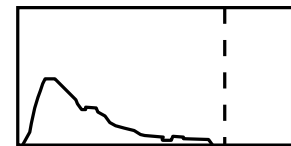
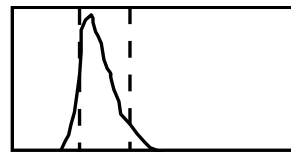
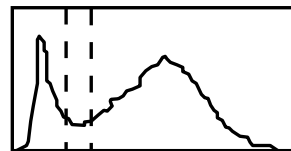
## 2.2 Mythic



### Findings MQ 2015-4 H3B

50 year old woman

|      |              |   |                     |               |
|------|--------------|---|---------------------|---------------|
| WBC  | <b>13.3</b>  | H | 10 <sup>9</sup> /l  | 3.5 / 10.0    |
| LYM  | 2.6          |   | 10 <sup>9</sup> /l  | 1.2 / 3.2     |
| MON  | 0.8          |   | 10 <sup>9</sup> /l  | 0.1 / 1.0     |
| GRA  | <b>9.9</b>   | H | 10 <sup>9</sup> /l  | 1.2 / 6.8     |
| LYM% | 19.9         |   | %                   | 17.0 / 48.0   |
| MON% | 6.0          |   | %                   | 2.0 / 10.0    |
| GRA% | 74.1         |   | %                   | 43.0 / 76.0   |
| RBC  | <b>3.79</b>  | I | 10 <sup>12</sup> /l | 4.00 / 5.70   |
| HGB  | <b>111</b>   | I | g/l                 | 140 / 180     |
| HCT  | <b>0.328</b> | I | l/l                 | 0.420 / 0.540 |
| MCV  | 86.5         |   | fl                  | 80.0 / 100.0  |
| MCH  | 29.3         |   | pg                  | 26.0 / 34.0   |
| MCHC | 338          |   | g/l                 | 310 / 365     |
| RDW  | 15.2         |   | %                   | 10.0 / 16.0   |
| PLT  | <b>44</b>    | I | 10 <sup>9</sup> /l  | 150 / 400     |
| MPV  | 8.8          |   | fl                  | 7.0 / 11.0    |
| PCT  | <b>0.039</b> | I | cl/l                | 0.100 / 0.500 |
| PDW  | 11.4         |   | %                   | 10.0 / 18.0   |





### 2.3 Sysmex XP300



#### Findings MQ 2015-4 H3B 50 year old woman

|        |   |       |                    |            |            |
|--------|---|-------|--------------------|------------|------------|
| WBC    | + | 13.3  | $10^3/\mu\text{L}$ | <p>WBC</p> |            |
| RBC    | - | 3.84  | $10^6/\mu\text{L}$ |            |            |
| HGB    | - | 113   | g/L                |            |            |
| HCT    | - | 0.336 | %                  |            |            |
| MCV    |   | 87.5  | fL                 |            |            |
| MCH    |   | 29.4  | pg                 |            |            |
| MCHC   |   | 336   | g/L                |            |            |
| PLT    | ! | 5     | $10^3/\mu\text{L}$ |            | <p>RBC</p> |
| LYM%   |   | 16.3  | %                  |            |            |
| MXD%   |   | 7.7   | %                  |            |            |
| NEUT%  | + | 76.0  | %                  |            |            |
| LYM#   |   | 2.2   | $10^3/\mu\text{L}$ |            |            |
| MXD#   |   | 1.0   | $10^3/\mu\text{L}$ |            |            |
| NEUT#  | + | 10.1  | $10^3/\mu\text{L}$ |            | <p>PLT</p> |
| RDW_SD | + | 48.8  | fL                 |            |            |
| RDW_CV |   | 15.2  | %                  |            |            |
| PDW    |   | ---   | fL                 |            |            |
| MPV    |   | ---   | fL                 |            |            |
| P_LCR  |   | ---   | %                  |            |            |
| PCT    |   | ---   | %                  |            |            |
| WBC    | + | 13.3  | $10^3/\mu\text{L}$ |            |            |

## 2.4 Sysmex XE-5000

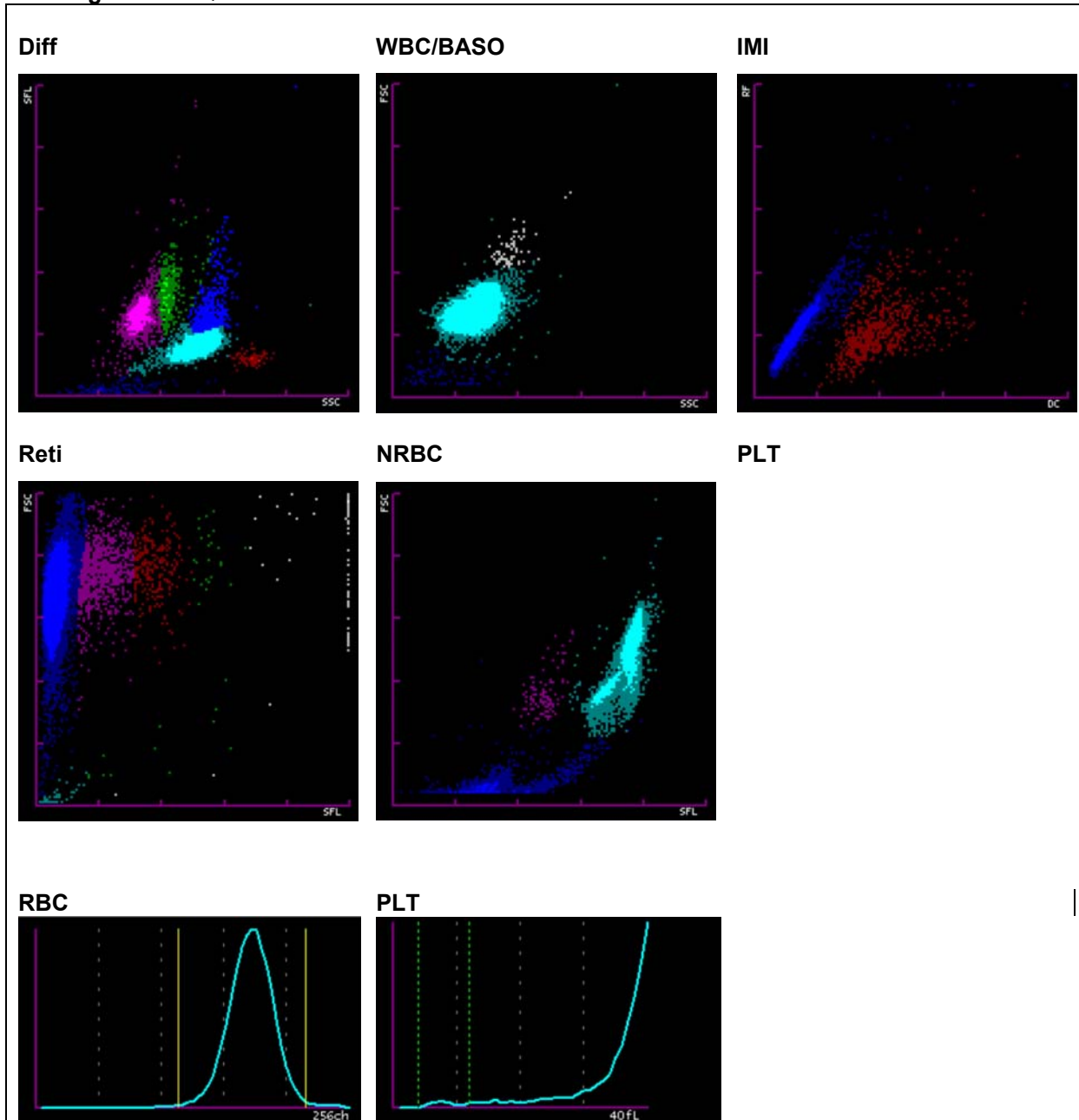


### Findings HAD MQ 2015-4 H3B

50 year old woman

| Analysis                         |   | Result | Unit    | Reference value |
|----------------------------------|---|--------|---------|-----------------|
| <b>Blood Count</b>               |   |        |         |                 |
| Hemoglobin                       | * | 112    | g/l     | 117-153         |
| Hematocrit                       | * | 0.334  | l/l     | 0.350-0.460     |
| Erythrocytes                     | * | 3.81   | T/l     | 3.9-5.2         |
| MCV                              |   | 87.7   | fl      | 80-100          |
| MCH                              |   | 29.4   | pg      | 26-34           |
| MCHC                             |   | 335    | g/l     | 310-360         |
| Mikrocytes                       | * | 15.6   | %       | 11.0-14.8       |
| Thrombocytes                     | * | 4      | G/l     | 143-400         |
| Leucocytes                       | * | 14.10  | G/l     | 3.0-9.6         |
| <b>Leucocyte Differentiation</b> |   |        |         |                 |
| Neutrophils                      | * | 10.99  | G/l     | 1.40-8.00       |
| Monocytes                        |   | 0.76   | G/l     | 0.16-0.95       |
| Eosinophils                      |   | 0.11   | G/l     | 0.00-0.70       |
| Basophils                        |   | 0.06   | G/l     | 0.00-0.15       |
| Lymphocytes                      |   | 2.18   | G/l     | 1.50-4.00       |
| IG abs.                          | * | 0.87   | G/l     | 0.00-0.03       |
| IG %                             | * | 6.2    | %       | 0.0-0.5         |
| NRBC abs.                        |   | 0.18   | G/l     |                 |
| NRBC                             |   | 1.3    | /100 Lc |                 |

**Findings HAD MQ 2015-4 H3B**

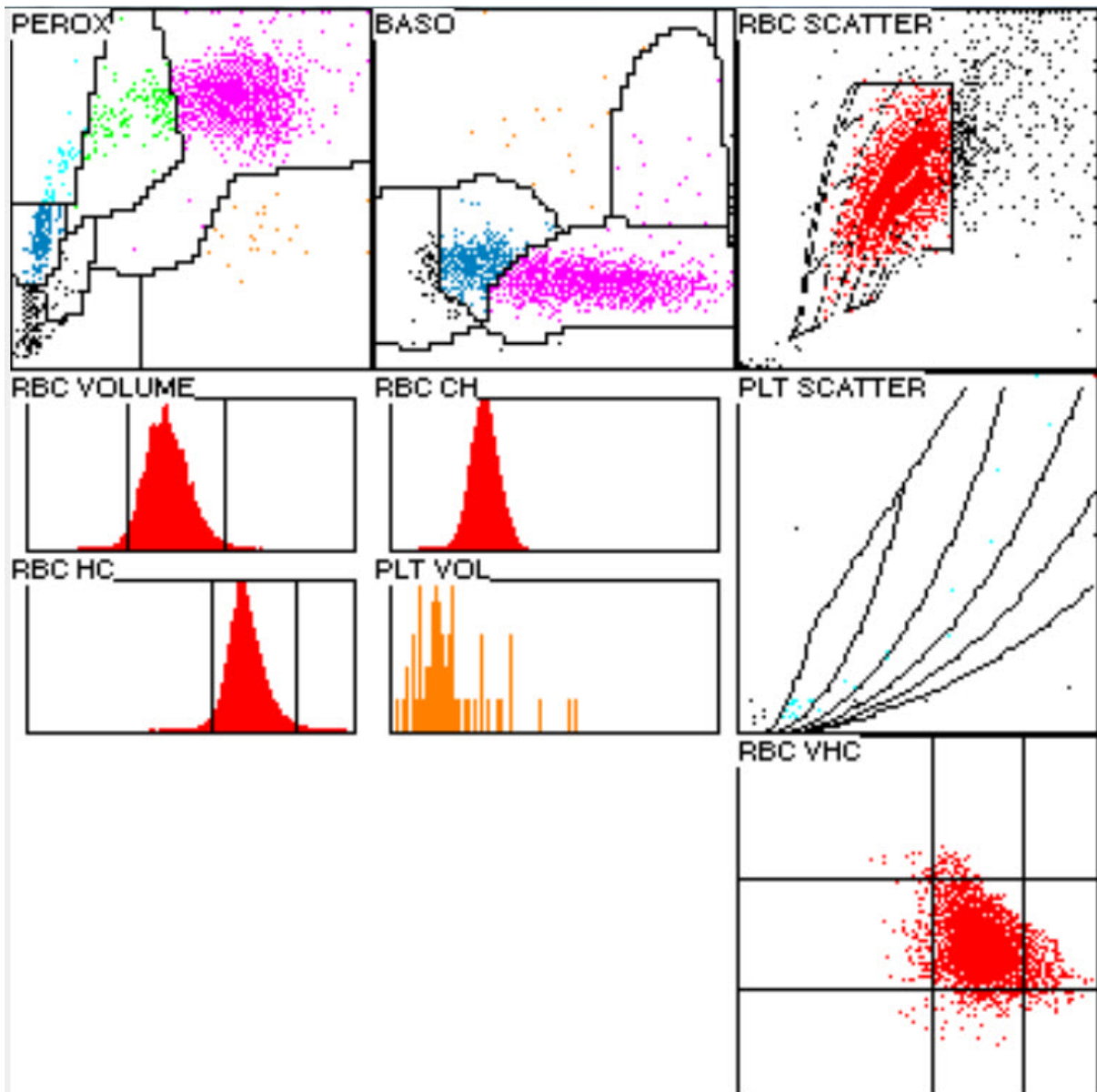


## 2.5 ADVIA 2120



### Findings HAD MQ 2015-4 H3B 50 year old woman

| Analysis                          | Result  | Unit | Reference value |
|-----------------------------------|---------|------|-----------------|
| <b>Blood Count</b>                |         |      |                 |
| Hemoglobin                        | * 112   | g/l  | 117-153         |
| Hematocrit                        | * 0.323 | l/l  | 0.350-0.460     |
| Erythrocytes                      | * 3.78  | T/l  | 3.9-5.2         |
| MCV                               | 85.4    | fl   | 80-100          |
| MCH                               | 29.6    | pg   | 26-34           |
| MCHC                              | 347     | g/l  | 310-360         |
| Mikrocytes                        | 1.9     | %    | 0-2.0           |
| Makrocytes                        | 0.8     | %    | 0-2.0           |
| Hypochromic Ec                    | * 2.2   | %    | 0-2.0           |
| Hyerchromic Ec                    | 1.5     | %    | 0-2.0           |
| RDW                               | * 15.7  | %    | 11.0-0-14.8     |
| Thrombocytes                      | 7       | G/l  | 143-400         |
| Vd. L-SHIFT                       | 0       | +    | Keine (0)       |
| Leukocytes                        | * 13.03 | G/l  | 3.0-9.6         |
| <b>Leucocytes Differentiation</b> |         |      |                 |
| Neutrophils                       | * 10.22 | G/l  | 1.40-8.00       |
| Monocytes                         | 0.58    | G/l  | 0.16-0.95       |
| Eosinophils                       | 0.09    | G/l  | 0.00-0.70       |
| Basophils                         | 0.06    | G/l  | 0.00-0.15       |
| Lymphocytes                       | 1.89    | G/l  | 1.50-4.00       |
| LUC                               | 1.6     | %    | 0.0-4.0         |



## 2.6 Differential Blood Smear

### Findings HAD MQ 2015-4 H3B

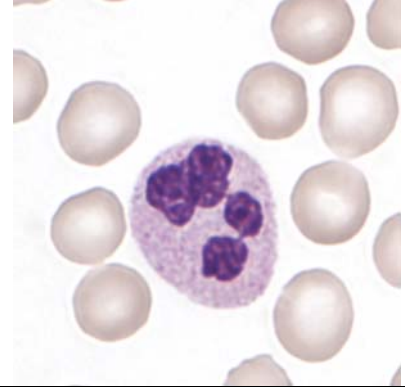
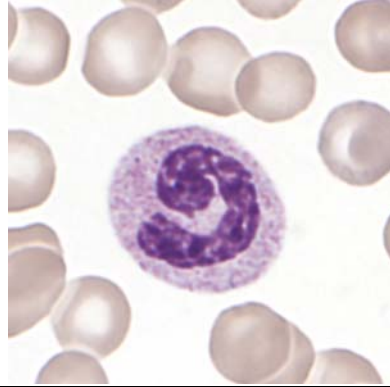
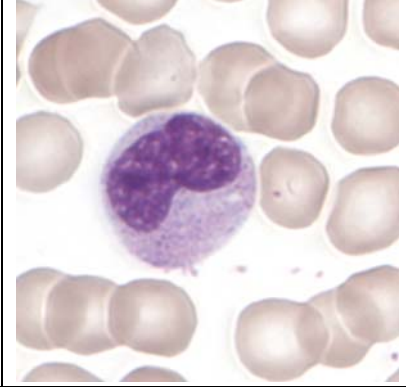
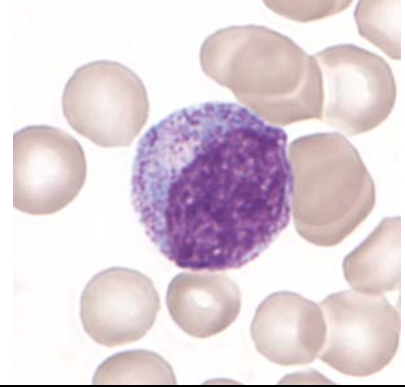
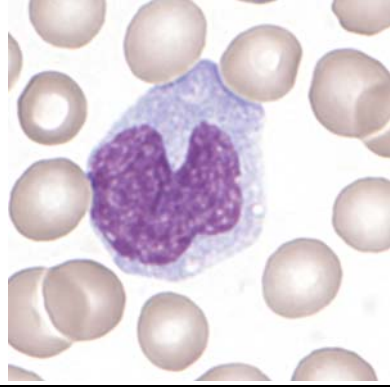
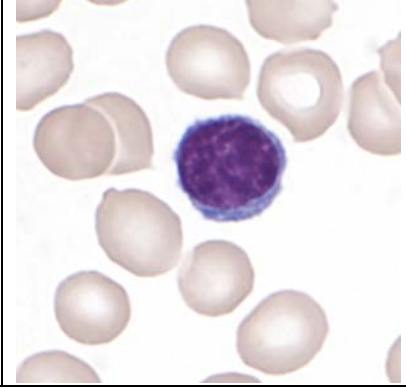
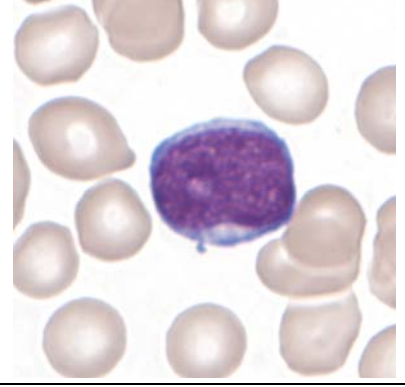
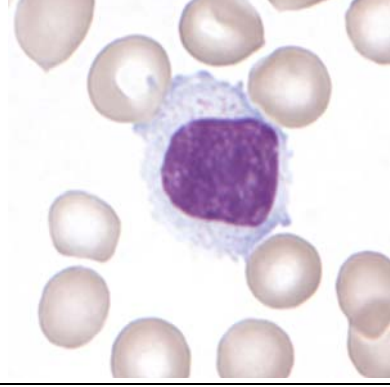
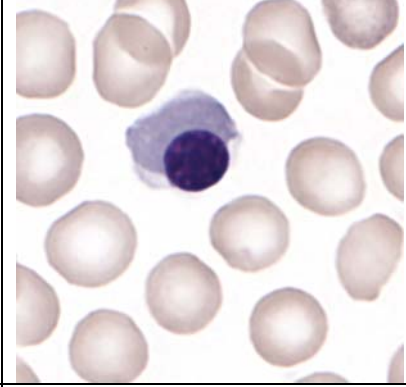
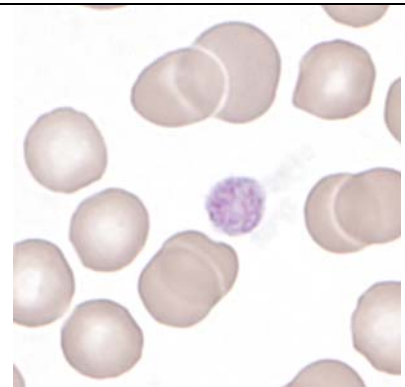
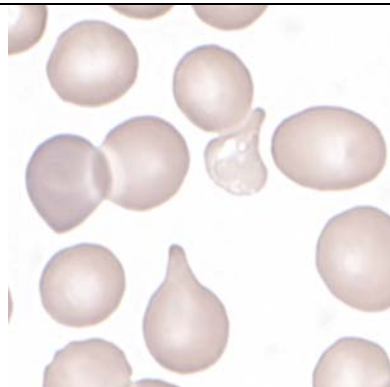
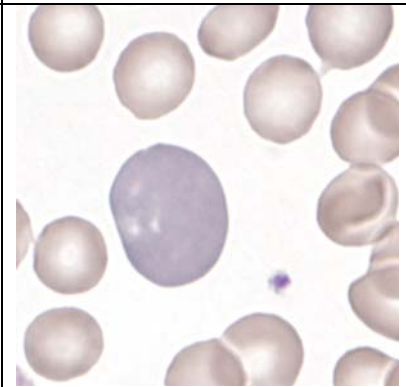
50 year old woman

| Analysis              |   | Result | Unit    | Reference value |
|-----------------------|---|--------|---------|-----------------|
| Neutrophils total     | * | 9.71   | G/l     | 1.40-8.00       |
| Monocytes             |   | 0.26   | G/l     | 0.16-0.95       |
| Eosinophils           |   | 0.07   | G/l     | 0.00-0.70       |
| Basophils             |   | 0.07   | G/l     | 0.00-0.15       |
| Lymphocytes           |   | 2.35   | G/l     | 1.50-4.00       |
| Neutrophils total     | * | 74.5   | %       | 40.0-74.0       |
| Neutrophils Band      |   | 14.0   | %       | 0.0-20.0        |
| Neutrophils Segmented | * | 60.5   | %       | 30.0-50.0       |
| Monocytes             | * | 2.0    | %       | 3.4-9.0         |
| Eosinophils           |   | 0.5    | %       | 0.0-7.0         |
| Basophils             |   | 0.5    | %       | 0.0-1.5         |
| Lymphocytes           | * | 18.0   | %       | 19.0-48.0       |
| Plasmacells           |   | 0.0    | %       | 0-0.5           |
| Blasts                |   | 0.0    | %       | 0               |
| Promyelocytes         | * | 0.5    | %       | 0               |
| Myelocytes            | * | 1.5    | %       | 0               |
| Metamyelocytes        | * | 2.5    | %       | 0               |
| Nucleated Red Cells   |   | 2.0    | /100 Lc |                 |

### Commentary

Severe thrombocytopenia, leukocytosis with washing out of myeloid precursors up to 0.5 % promyelocytes. In the red blood cell count, mild anemia is seen with minor hypochromasia, minor anisocytosis with few microcytes and macrocytes, discrete polychromasia, minor poikilocytosis with few ovalocytes, 0-1 tear-drop forms per visual field, 2.0 erythroblasts / 100 leukocytes. No erythrocytic inclusions. The platelets show clear anisocytosis, in microscopy rare giant forms. Neutrophil granulocytes with fine to slightly coarse cytoplasmic granulation, many highly segmented nucleic forms. Lymphocytes are polymorphic in term of sizes and nuclei, in microscopy two lymphocytes with a dark-basophilic cytoplasmic border and indicated nucleolus (atypical, probably reactive).

K. Schreiber / Dr. J. Goede

|                                                                                     |                                                                                     |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|    |    |    |
| <i>Abb 1. Neutrophil (Seg)</i>                                                      | <i>Abb 2. Neutrophil (band)</i>                                                     | <i>Abb 3. Metamyelocyte</i>                                                           |
|   |   |   |
| <i>Abb 4. Myelocyte</i>                                                             | <i>Abb 5. Monocyte</i>                                                              | <i>Abb 6. Lymphocyte</i>                                                              |
|  |  |  |
| <i>Abb 7. Lymphocyte</i>                                                            | <i>Abb 8. Lymphocyte</i>                                                            | <i>Abb 9. Erythroblast</i>                                                            |
|  |  |  |
| <i>Abb 10. Macrothrombocyte</i>                                                     | <i>Abb 11. Teardrops</i>                                                            | <i>Abb 12. Polychromasia</i>                                                          |

## 2.7 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>       |      | 15   | 68  | 190*  | 50    | 7     | 6     | 1     | 2     |       |     |
| <i>Neutrophils Segmented.</i> | 2    |      |     | 4     | 2     | 9     | 32    | 162   | 119*  | 9     |     |
| <i>Eosinophils</i>            | 154* | 181  | 1   | 1     | 1     |       |       |       | 1     |       |     |
| <i>Basophile</i>              | 244* | 93   | 1   | 1     |       |       |       |       |       |       |     |
| <i>Monocytes</i>              | 22   | 213* | 84  | 20    |       |       |       |       |       |       |     |
| <i>Lymphocytes</i>            |      |      | 3   | 179*  | 141   | 13    | 1     | 1     |       |       | 1   |
| <i>Plasmacells</i>            | 332* | 6    | 1   |       |       |       |       |       |       |       |     |
| <i>Blasts</i>                 | 287* | 45   | 5   | 2     |       |       |       |       |       |       |     |
| <i>Promyelocytes</i>          | 271* | 65   | 1   | 2     |       |       |       |       |       |       |     |
| <i>Myelocytes</i>             | 181  | 138* | 13  | 7     |       |       |       |       |       |       |     |
| <i>Metamyelozyten</i>         | 196  | 131* | 11  | 1     |       |       |       |       |       |       |     |
| <i>Erythrocytes Nucleated</i> | 169  | 161* | 6   | 3     |       |       |       |       |       |       |     |
| <i>Unknown</i>                | 314* | 15   | 7   | 2     | 1     |       |       |       |       |       |     |
| <i>Smudge cells</i>           | 320* | 17   | 2   |       |       |       |       |       |       |       |     |

### Beurteilung H3-B

|                                   | <i>light</i> | <i>medium</i> | <i>strong</i> |                             | <i>light</i> | <i>medium</i> | <i>strong</i> |
|-----------------------------------|--------------|---------------|---------------|-----------------------------|--------------|---------------|---------------|
| <i>Hypersegmentation</i>          | 83           | 28            | 8             | <i>Hypochromic Ec</i>       | 71*          | 21            | 4             |
| <i>Pelger-Hüet Anomaly</i>        | 4            | 2             |               | <i>Polychromatic Ec</i>     | 112*         | 116           | 18            |
| <i>Coarse Granulation</i>         | 112          | 52            | 5             | <i>Anisocytes</i>           | 141*         | 103           | 10            |
| <i>Basophilic Stripling</i>       | 18           | 5             |               | <i>Mikrocytes</i>           | 110*         | 36            | 2             |
| <i>Vacuoles</i>                   | 32           | 10            | 1             | <i>Makrocytes</i>           | 83*          | 10            |               |
| <i>Atypical Lymph, reactive</i>   | 49           | 18            | 3             | <i>Megalocytes</i>          | 19           |               |               |
| <i>Atypical Lymph, neoplastic</i> | 3            |               |               | <i>Poikilocytosis</i>       | 154*         | 30            | 4             |
| <i>Others</i>                     | 9            | 7             | 2             | <i>Ovalocytes</i>           | 63*          | 4             |               |
|                                   |              |               |               | <i>Target Cells</i>         | 15           |               |               |
|                                   |              |               |               | <i>Akanthocytes</i>         | 32           | 4             |               |
| <i>Anisocytosis</i>               | 56           | 24            | 11*           | <i>Echinocytes</i>          | 24           | 1             |               |
| <i>Megakaryocyte Nucleaus</i>     | 7            | 4             |               | <i>Sickle Cells</i>         | 4            |               |               |
| <i>Granulation</i>                | 10           | 6             | 5             | <i>Fragmentocytes</i>       | 17           | 2             |               |
| <i>Others</i>                     | 83           | 28            | 8             | <i>Spherocytes</i>          | 17           | 3             | 1             |
|                                   |              |               |               | <i>Stomatocytes</i>         | 24           | 2             |               |
|                                   |              |               |               | <i>Basophilic Stripling</i> | 127          | 44            | 3             |
|                                   |              |               |               | <i>Howell-Jolly Bodies</i>  | 8            | 1             | 1             |
|                                   |              |               |               | <i>Pappenheim Bodies</i>    | 3            |               |               |
|                                   |              |               |               | <i>Others</i>               | 6            | 4             |               |

\* Target Value



## 2.8 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>231</b> |
| <b>15</b> | <b>Polychromatophilic Red Cells</b>         | <b>173</b> |
| <b>31</b> | <b>Pathologic findings</b>                  | <b>112</b> |
| 25        | Basophilic strippling                       | 107        |
| <b>2</b>  | <b>Neutrophils, left shift</b>              | <b>77</b>  |
| <b>11</b> | <b>Thrombocytes, others</b>                 | <b>75</b>  |
| <b>26</b> | <b>Teardrops</b>                            | <b>64</b>  |
| 16        | Poikilocytosis                              | 54         |
| 1         | Neutrophils, hypersegmentation of nucleus   | 52         |
| 12        | Microcytes                                  | 49         |
| 4         | Neutrophils, Toxic Changes                  | 42         |
| 14        | Hypochromic Erythrocytes                    | 35         |
| 5         | Atypical lymphocytes, probably reactive     | 29         |
| 13        | Macrocytes                                  | 25         |
| 9         | Macrothrombocytes                           | 23         |
| 27        | Erythrocytes, other                         | 19         |
| 8         | Leucocytes other:                           | 16         |
| 17        | Elliptocytes/Ovalocytes                     | 11         |
| 22        | Rouleaux                                    | 8          |
| 29        | Normal findings                             | 8          |
| 6         | Atypical lymphocytes, probably neoplastic   | 6          |
| 21        | Spherocytes                                 | 5          |
| 18        | Stomatocytes                                | 3          |
| 3         | Pelger Hüet Anomaly                         | 2          |
| 19        | Targetcells                                 | 2          |
| 10        | Thrombocyte aggregates                      | 1          |
| 20        | Fragmentocytes                              | 1          |
| 23        | Erythrocytes agglutination                  | 1          |
| 24        | Howell-Jolly bodies                         | 1          |