A valuable contribution to anaemia diagnosis: 
The right combination of parameters highlights the complete picture of erythropoiesis and its further development

Only the combined information of quantity- and quality-related RET parameters provides the whole picture behind anaemia diagnosis

RET%, RET#, IRF – quantifying mature and immature reticulocytes

RET-Hₑ – the haemoglobinisation of the reticulocytes

Predict successful engraftment reliably

The immature reticulocyte fraction (IRF) is an indicator of erythropoiesis and correlates well with the engraftment of neutrophils (for more information: Sysmex white paper 'Managing haematopoietic stem cell transplantation pre-and post-apheresis').*

Patient with chronic anaemia receiving iron and erythropoietin therapy

Anaemia is a symptom of various clinical disorders. However, it is often underestimated as a functional disorder of red blood cells. When compared with the haemoglobin value or other RBC parameters, the RET-Hₑ value and advanced parameter combinations enable significantly faster control during iron and/or erythropoietin therapy.

Your benefits in daily routine

- Rapid determination of the erythropoietic status using haematological routine diagnostics
- Very sensitive prognostic significance, which helps to rapidly identify an emerging anaemia as a side-effect or even the recovery during a successful treatment
- The possibility of close therapy monitoring, which is necessary, for example, with dialysis patients

- In cases of interference with red blood cells and their associated parameters, such as the MCHC, there is an optional 'CBC-O' algorithm embedded in the Extended IPU. It delivers conclusive information about the cause of interference, suggests replacement of the affected parameters with their counterparts from the RET analysis and automatically recalculates the RBC indices. Using CBC-O reduces the need for laborious manual testing of such samples.

* Benefit from more background information in our freely accessible white papers: www.sysmex-europe.com/whitepapers
Diagnostic parameters

- **Quantitative information**
  - the reticulocyte count (RET%, #)
  - about the reticulocytes corresponding to their stage of maturation:
    - the immature reticulocyte fraction = IRF
    - the three stages of reticulocyte maturation: HFR ('immature' reticulocytes, high-fluorescence ratio), MFR ('semi-mature' reticulocytes, medium-fluorescence ratio) and LFR ('mature' reticulocytes, low-fluorescence ratio)

- **Quality information**
  - regarding the newly formed red blood cells:
    - the reticulocyte haemoglobin equivalent (RET-Hₑ)
  - regarding the red blood cells:
    - the red blood cell haemoglobin equivalent (RBC-Hₑ), a counterpart to the MCH
    - the percentage of RBC with a hypochromic haemoglobin equivalent (HYPO-Hₑ)
    - the percentage of RBC with a hyperchromic haemoglobin equivalent (HYPER-Hₑ)

- **Prognostic information**
  - The difference between RBC-Hₑ and RET-Hₑ (Delta-Hₑ) can contribute to the prognostic information regarding the course of the anaemia.
  
An optical platelet count (if there is reason to believe that the PLT-I is not reliable and the PLT-F application is not available)

Research parameters

- **RBC information**
  - the fragmented red blood cell count (FRC%, #)
  - an optical red blood cell count (RBC-O) – a counterpart to the RBC-I
  - an optical haemoglobin value (HGB-O) – a counterpart to the SLS haemoglobin measurement

- **Prognostic reticulocyte information**
  - the reticulocyte production index (RPI), a standard component of haematology testing

Technology of RET detection

- **Fluorescence flow cytometry**
  - The lysis reagent initially perforates the cell membranes while leaving the cells largely native.
  - In a second step, the fluorescence marker labels the intracellular nucleic acids, whereby the intensity of the resulting fluorescence signal is directly proportional to the nucleic acid content. Since the RNA content decreases during the maturation process of the reticulocytes, one can determine three parameters that reflect these maturation stages.
  - Reticulocytes emit a higher fluorescence signal than mature red blood cells, which no longer contain RNA, and a considerably lower fluorescence signal than white blood cells. As a result, the interference from these cell types can be reduced to a minimum. Exceptions to this are displayed by the analysis system as a flagging message. This provides for very high analytical safety.

Measurement modes

- In addition to the whole blood mode (standard mode), the RET profile can also be analysed in the pre-diluted mode.