

## Immediate support for determining the cause of thrombocytopenia

Differential diagnosis of thrombocytopenia is a complex process that usually covers patient history, clinical symptoms, platelet function tests and assessing routine blood-derived platelet parameters. If the cause of the low platelet concentration remains unclear, the invasive bone marrow biopsy technique is generally recommended for investigating the underlying aetiology. Since thrombocytopenia can be life-threatening, rapid diagnosis and a related decision regarding therapy is essential. A specific, fast and easily accessible blood test marker is therefore desirable to promptly discriminate between decreased bone marrow production and increased destruction or consumption in peripheral blood. The immature platelet fraction (IPF) parameter delivers the necessary results in this area.



A five-year-old girl with a history of prolonged mucocutaneous bleeding following trivial injuries and current isolated thrombocytopenia with a platelet count of  $30 \times 10^9/L$  is admitted to the haematology ward. Bleeding time, prothrombin time, activated partial thromboplastin time and thrombin time are all within the normal range. The immature platelet fraction (IPF) is highly increased to 46%. Based on the girl's unusually high IPF and other laboratory results the physician suspects hereditary macrothrombocytopenia rather than immune thrombocytopenia (ITP). A follow-up smear review reveals the presence of large platelets with high RNA content and Döhle-like inclusions within the cytoplasm of the leucocytes. Confirmatory diagnosis of May-Hegglin anomaly is made by molecular testing for the MYH9 gene.

### What is the immature platelet fraction, or IPF?

- The percentage of immature platelets within the total platelet count, determined from a patient's peripheral blood sample
- Immature or reticulated platelets are newly released with a high amount of RNA directly reflecting bone marrow activity
- IPF reference range: 1.1 – 6.1%\*
- The platelet analogue of the reticulocytes in red cell populations
- IPF highly correlates with reticulated platelets determined by immune flow cytometry\*

IMMATURE PLATELETS  
CLINICAL USE

Know more.  
Decide with confidence.  
Act faster.

Thrombocytopenia			
Acquired		Hereditary	
<p><b>Ineffective platelet production</b></p> <p><b>Bone marrow damage:</b></p> <ul style="list-style-type: none"> <li>■ Myelodysplastic syndromes</li> <li>■ Neoplastic bone marrow infiltration</li> <li>■ Aplastic anaemia caused by chemicals, drugs or infections</li> <li>■ Chronic ITP with apoptotic megakaryocytes</li> </ul> <p><b>Ineffective production:</b></p> <ul style="list-style-type: none"> <li>■ Megaloblastic anaemia</li> </ul>	<p><b>Increased platelet destruction / consumption</b></p> <p><b>Immune causes:</b></p> <ul style="list-style-type: none"> <li>■ Immune thrombocytopenia (ITP)</li> <li>■ Heparin-induced thrombocytopenia (HIT) type II</li> </ul> <p><b>Non-immune causes:</b></p> <ul style="list-style-type: none"> <li>■ Thrombotic thrombocytopenic purpura (TTP)</li> <li>■ Haemolytic uraemic syndrome (HUS)</li> <li>■ Disseminated intravascular coagulation (DIC)</li> <li>■ HIT type I</li> <li>■ Bleeding</li> </ul>	<p><b>Congenital macrothrombocytopenia</b></p> <ul style="list-style-type: none"> <li>■ Bernard-Soulier syndrome</li> <li>■ ACTN1-related thrombocytopenia</li> <li>■ <math>\alpha\delta</math>-storage pool disease</li> <li>■ Variant form of Glanzmann thrombasthenia</li> <li>■ May-Hegglin MYH9 disorders</li> </ul>	
IPF 1.1 – 6.1%	IPF > 6.1%	IPF > 12%	IPF > 40%
Immature Platelet Fraction			

IPF values reported in common thrombocytopenic disorders. The ranges are provided for guidance purposes only. IPF values should be used in conjunction with a patient's clinical symptoms and other laboratory tests and interpreted in the patient's clinical context.

### Conclusion

The haematological parameter 'immature platelet fraction' (IPF) supports differential diagnosis of thrombocytopenia.\*

- IPF is not increased when thrombocytopenia is caused by decreased platelet production in bone marrow (aplastic pathology).
- IPF is increased when thrombocytopenia is caused by increased destruction or loss of platelets in peripheral blood (consumptive pathology).
- IPF is highest in hereditary macrothrombocytopenia; generally higher than in consumptive thrombocytopenia.

### Your benefits

- Information about the immature platelet fraction may remove the need for invasive bone marrow biopsies. This is far more comfortable for the patient and saves costs and time.
- The IPF parameter is readily available from a routine blood test in the laboratory, and may be ordered and processed together with the complete blood count.
- Since younger platelets are not necessarily larger, the IPF can better discriminate between the causes of thrombocytopenia than the mean platelet volume (MPV) and is reported reliably even with very low platelet counts.
- The earlier the disease is identified and treated, the less expensive and more effective treatment will be.

\* Benefit from more background information in our freely accessible white papers: [www.sysmex-europe.com/whitepapers](http://www.sysmex-europe.com/whitepapers)