

From  
Biotechnology  
to Diagnosis

# Monitoring of P2Y12 receptor antagonists

## **PLT VASP/P2Y12**

Ref. # 7014

RESTING

ACTIVATED

Image courtesy of John W. Weisel, PhD, and Chandrasekaran Nagaswami, University of Pennsylvania School of Medicine

- ✓ **Clinical applications :**  
Monitoring of specific platelet ADP receptor (P2Y12) antagonists (Thienopyridines and analogues)
- ✓ **Pharmaceutical applications :**  
New drug discovery and validation of new P2Y12 antagonists
- ✓ **Technology :**  
Flow cytometry
- ✓ **Sample :**  
Citrated whole blood
- ✓ **Preamalytical feature :**  
48H sample stability
- ✓ **Biological evaluations :**
  - BARRAGAN P. *et al.*; (2003) Cathet Cardiovasc Intervent 59 : 295-302
  - ALEIL B. *et al.*; (2005) J Thromb Haemost. 3 : 85-92

**CE** marked.  
In Europe, For In Vitro Diagnostic Use



140, Chemin de l'Armée d'Afrique - 13010 Marseille - France  
RCS Marseille 347 897 985  
Tél. : 04 96 12 20 40 - Fax : 04 91 47 24 71  
Tél. : Int. + (33) 4 96 12 20 40 - Fax : Int. + (33) 4 91 47 24 71  
E-mail : info@biocytex.fr - Website : www.biocytex.fr



# Monitoring of P2Y12 receptor antagonists :

## Background :

ADP is one of the most important mediators of haemostasis. It leads to platelet activation through two G-protein coupled receptors, P2Y1 and P2Y12. The P2Y1 receptor is responsible for the initiation of ADP-induced aggregation while the P2Y12 receptor mediates completion and amplification of the aggregation response.

## Monitoring of Thienopyridine :

Clopidogrel is an antiplatelet drug which inhibits the P2Y12 receptor. Alone or in association with Aspirine, this drug has proved efficacy in the prevention of atherothrombotic complications. However, several studies has recently described inter-individual variability and resistance to Clopidogrel<sup>(1)(2)(3)</sup>.

<sup>(1)</sup>GURBEL P.A. *et al.* (2003)

Circulation 107 : 2908-2913

<sup>(2)</sup>MULLER I. *et al.* (2003)

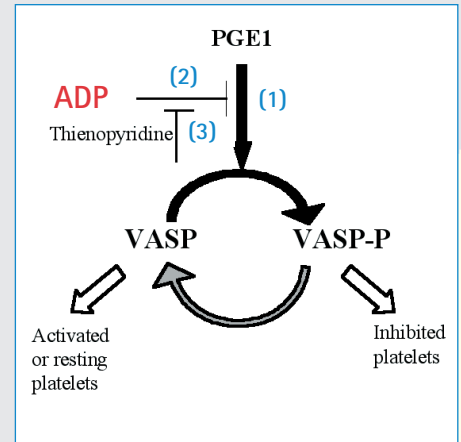
Thromb Haemost. 89 : 783-787

<sup>(3)</sup>SEREBRUANY V.L. *et al.* (2005)

J AM Coll Cardiol 45 : 246-251

## Diagnostic test :

VASP (Vasodilator Stimulated Phosphoprotein) is an intracellular platelet protein which is non phosphorylated at basal state. VASP phosphorylation is regulated by the cAMP (cyclic Adenosine Monophosphate) cascade. PGE1 (Prostaglandin E1) activates this cascade (1) whereas it is inhibited by ADP (Adenosine Diphosphate) through P2Y12 receptor (2). In the test conditions, VASP phosphorylation correlates with the P2Y12 receptor inhibition, whereas its non-phosphorylation state correlates with the active form of P2Y12 receptor. *PLU VASP/P2Y12* allows to evaluate the efficacy of Thienopyridines (3) *ex vivo* measuring the persistence of VASP phosphorylation induced by PGE1 even with the simultaneous addition of ADP. *PLU VASP/P2Y12* could also be used to evaluate *in vitro* effects of P2Y12 receptor antagonists.



## Test interpretation :

A platelet reactivity index (PRI) is calculated using corrected mean fluorescence intensities (MFIc) in the presence of PGE1 alone, MFIc<sub>(PGE1)</sub>, or PGE1 and ADP simultaneously, MFIc<sub>(PGE1+ADP)</sub>, according to the following calculation :

$$PRI = [(MFIc_{PGE1} - MFIc_{(PGE1 + ADP)}) / MFIc_{PGE1}] \times 100$$

## Monitoring of P2Y12 (ADP receptor) antagonists :

