

Cambridge University Press

978-0-521-88115-9 - Platelets in Hematologic and Cardiovascular Disorders: A Clinical Handbook

Edited by Paolo Gresele, Valentin Fuster, Jose A. Lopez, Clive P. Page and Jos Vermynen

Frontmatter

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# PLATELETS IN HEMATOLOGIC AND CARDIOVASCULAR DISORDERS

## A Clinical Handbook

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## PREFACE

Progress in the field of platelet research has accelerated greatly over the last few years. If we just consider the time elapsed since our previous book on platelets (*Platelets in Thrombotic And Non-Thrombotic Disorders*, 2002), over 10 000 publications can be found in a PubMed search using the keyword “platelets.”

Many factors account for this rapidly expanding interest in platelets, among them an explosive increase in the knowledge of the basic biology of platelets and of their participation in numerous clinical disorders as well as the increasing success of established platelet-modifying therapies in several clinical settings. All of this has led to the publication of several books devoted to platelets in recent years. Nevertheless, it is surprising that none of these is a handbook that presents a comprehensive and pragmatic approach to the clinical aspects of platelet involvement in hematologic, cardiovascular, and inflammatory disorders and the many new developments and controversial aspects of platelet pharmacology and therapeutics.

Based on these considerations, this new book was not prepared simply as an update of the previous edition but has undergone a number of conceptual and organizational changes.

A new editor with a specific expertise in hematology, Dr. José López, has joined the group of the editors, bringing in a hematologically oriented view. The book has been shortened and is now focused on the clinical aspects of the involvement of platelets in hematologic and cardiovascular disorders. Practical aspects of the various topics have been strongly emphasized, with the aim of providing a practical handbook useful for residents in hematology and cardiology, medical and graduate students, physicians, and also scientists interested in the broad clinical implications

of platelet research. We expect that this book will also be of interest to vascular medicine specialists, allergologists, rheumatologists, pulmonologists, diabetologists, and oncologists.

The book has been organized into four sections, covering platelet physiology, bleeding disorders, thrombotic disorders, and antithrombotic therapy. A total of 26 chapters cover all the conventional and less conventional aspects of platelet involvement in disease; emphasis has been given to the recent developments in each field, but always mentioning the key discoveries that have contributed to present knowledge. A section on promising future avenues of research and a clear table with the heading “Take-Home Messages” have been included in each chapter. A group of leading experts in the various fields covered by the book, from eight countries on three continents, have willingly agreed to participate; many of them are clinical opinion leaders on the topics discussed. All chapters have undergone extensive editing for homogeneity, to help provide a balanced and complete view on the various subjects and reduce overlap to a minimum.

We believe that, thanks to the efforts and continued commitment of all the people involved, the result is a novel, light, and quick-reading handbook providing an easy-to-consult guide to the diagnosis and treatment of disorders in which platelets play a prominent role.

Additional illustrative material is available online through the site of Cambridge University Press ([www.cambridge.org/9780521881159](http://www.cambridge.org/9780521881159)).

This book would have not been possible without the help of our editorial assistants (M. Sensi, R. Stevens) and of several coworkers in the Institutions of the individual editors (S. Momi, E. Falcinelli). An excellent

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## Preface

collaboration with the team at Cambridge University Press (Daniel Dunlavey, Deborah Russell, Rachael Lazenby, Katie James, Jane Williams, and Eleanor Umali) has also been crucial to the successful accomplishment of what has seemed, at certain moments, a desperate task.

We hope that this book will be interesting and useful to readers as much as it has been for us.

The Editors

## GLOSSARY

$\alpha_{IIb}\beta_3$	$\alpha_{IIb}\beta_3$ or glycoprotein IIb-IIIa	DDAVP	L-deamino-8-O-darginine vasopressin
$\alpha_{IIb}\beta_3, \alpha_2\beta_1$	Platelet integrins	DIC	Disseminated intravascular coagulation
$\alpha_M\beta_2, \alpha_L\beta_2$	Leukocyte $\beta_2$ integrins	DTS	Dense tubular system
$\alpha_v\beta_3$	Vitronectin receptor	DVT	Deep venous thrombosis
$\beta$ -TG	$\beta$ -thromboglobulin	EC	Endothelial cells
AA	Arachidonic acid	ECM	Extracellular matrix
ACD	Citric acid, sodium citrate, dextrose	EDHF	Endothelium-derived hyperpolarizing factor
ACS	Acute coronary syndrome	EDTA	Ethylene diamine tetracetic acid
ADP	Adenosine-5'-diphosphate	EGF	Epidermal growth factor
AKT	Serine/threonine protein kinase	eNOS	Endothelial nitric oxide synthase
APS	Antiphospholipid antibody syndrome	EP	PGE <sub>2</sub> receptor
ASA	Acetylsalicylic acid	EPCs	Endothelial progenitor cells
ATP	Adenosine-5'-triphosphate	ERK	Extracellular signal-regulated kinase
AVWS	Acquired von Willebrand syndrome	ET	Essential thrombocytemia
BSS	Bernard–Soulier syndrome	FAK	Focal adhesion kinase
BT	Bleeding time	Fbg	Fibrinogen
CAD	Coronary artery disease	Fn	Fibrin
cAMP	Cyclic AMP	GEF	Guanine nucleotide exchange factor
CAMT	Congenital amegacaryocytic thrombocytopenia	GP	Glycoprotein (e.g., GP Ib, GP Ib/IX/V)
CD40L (CD154)	CD40 ligand	GPIb	Glycoprotein Ib
CD62P	P-selectin	GPCR	G protein-coupled receptor
CFU	Colony forming unit	GPS	Gray platelet syndrome
cGMP	Cyclic GMP	GT	Glanzmann's thrombasthenia
CHS	Chediak–Higashi syndrome	12-HETE	12-(S)-hydroxyeicosatetraenoic acid
CML	Chronic myeloid leukemia	HDL	High-density lipoprotein
COX-1	Cyclooxygenase-1	HIT	Heparin-induced thrombocytopenia
COX-2	Cyclooxygenase-2	HLA	Human leukocyte antigen
CPD	Citrate-phosphate-dextrose	HPA	Human platelet antigen
CRP	C-reactive protein		
CVID	Common variable immunodeficiency		

## Glossary

HPS	Hermansky–Pudlak syndrome	MPV	Mean platelet volume
5-HT	5-hydroxytryptamine	NAIT	Neonatal allo-immune thrombocytopenia
HUS	Hemolytic uremic syndrome	NFkB	Nuclear factor kB
ICAM-1	Intercellular adhesion molecule-1	nNOS	Neuronal nitric oxide synthase
ICAM-2	Intercellular adhesion molecule-2	NO	Nitric oxide
ICH	Intracranial hemorrhage	NSAID	Nonsteroidal anti-inflammatory drug
IFN	interferon	NSTEMI	Non-ST-elevation myocardial infarction
IL	Interleukin	OCS	Open canalicular system
iNOS	Inducible nitric oxide synthase	PAF	Platelet activating factor
IP	Prostacyclin receptor	PAIgG	Platelet-associated IgG
ITP	Idiopathic thrombocytopenic purpura	PAR	Protease-activated receptor (e.g., PAR1, PAR4)
IVIG	Intravenous immunoglobulin	PDE inhibitors	phosphodiesterase inhibitors
JAK	Janus family kinase	PDGF	Platelet-derived growth factor
JAM	Junctional adhesion molecule	PE	Pulmonary embolism
JNK	c-Jun N-terminal kinase	PFA-100®	Platelet Function Analyzer-100®
LDL	Low-density lipoprotein	PG	Prostaglandin
LDH	lactate dehydrogenase	PGH2	Prostaglandin H2
LFA-1	Leukocyte function-associated molecule-1	PGI <sub>2</sub>	Prostacyclin (prostaglandin I <sub>2</sub> )
LMWHs	Low-molecular-weight heparins	PI	Phosphatidylinositol
LOX-1	Lectin-like oxLDL-1	PIP2	Phosphoinositide 4,5 biphosphate
LPS	Lipopolysaccharide	PIP3	Phosphoinositide 3, 4, 5 tris phosphate
LT	Leukotriene	PI3K	Phosphoinositol-3 kinase
MAC-1 (CD11b/CD18)	Leukocyte integrin $\alpha_M\beta_2$	PKA	Protein kinase A
MAIPA	Monoclonal antibody-specific immobilization of platelet antigens	PKC	Protein kinase C
MAPK	Mitogen-activated protein kinase	PLA <sub>2</sub>	Phospholipase A <sub>2</sub>
MAPKK, MEKK	MAPK kinase kinase	PLTs	Platelets
MCP-1	Monocyte chemoattractant protein-1	PMN	Polymorphonuclear cells
MDS	Myelodysplastic syndrome	PMP	Platelet microparticles
MEK, MAPKK	MAPK/ERK kinase	PNH	Paroxysmal nocturnal hemoglobinuria
MF	Myelofibrosis	PPP	Platelet-poor plasma
MI	Myocardial infarction	PR	Platelet reactivity index
MIP-1 $\alpha$	Macrophage inflammatory protein-1 $\alpha$	PRP	Plateletrich plasma
MK	Megakaryocyte	PS	phosphatidyl serine
MMPs	Matrix metalloproteinases	PSGL-1	P-selectin glycoprotein ligand-1
MPD	Myeloproliferative disorders	PT	Prothrombin time
		PTP	Posttransfusion purpura
		PTT	Partial thromboplastin time
		PUBS	Periumbilical blood sampling
		PV	Polycythemia vera

## Glossary

RANTES	Regulated on activation normal T cell-expressed and secreted	TNF	Tumor necrosis factor
RGD	Arg-Gly-Asp	TNF $\alpha$	Tumor necrosis factor $\alpha$
ROS	Reactive oxygen species	TP	Thromboxane A2 receptor
SDF-1	Stromal cell-derived factor 1	TPO	Thrombopoietin
STEMI	ST-segment-elevation myocardial infarction	TTP	Thrombotic thrombocytopenic purpura
TAR	Congenital thrombocytopenia with absent radius	TxA <sub>2</sub>	Thromboxane A <sub>2</sub>
TARC	Thymus and activation- regulated chemokine	UFH	Unfractionated heparin
TF	Tissue factor	UVA, UVB	Ultraviolet A, ultraviolet B
TGF	Transforming growth factor	VCAM-1	Vascular cell adhesion molecule-1
TMA	Thrombotic microangiopathy	VWF	von Willebrand factor
		WAS	Wiskott–Aldrich syndrome
		WBCs	White blood cells
		WP	Washed platelet