



## BOOK REVIEW

### **Platelet Proteomics Principles, Analysis, and Applications**

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The development of proteomics technologies over the past decade has revolutionized the study of platelets, which were somewhat marginalised, owing to their lack of a nucleus and low abundance of mRNAs, by earlier “omics” technologies that focused on the genome and transcriptome. Protein–protein interactions are fundamental to the highly complex regulation of platelet function, and recent proteomic applications have enabled more thorough qualitative and quantitative analyses of the total-platelet proteome and platelet sub-proteomes, including intracellular signalling networks, the platelet membrane, platelet granules, and platelet releasate. The book *Platelet Proteomics Principles, Analysis and Applications* provides an up-to-date overview of proteomic technologies and their application in advancing knowledge of the complex biology and pathophysiology of platelets.

The book comprises 14 chapters divided into three parts. The first three chapters provide an introduction to platelets and a review of applications of proteomic technologies. Chapter 1 introduces platelets and their role in thrombosis and cardiovascular disease and provides a brief overview of the contribution of proteomic technologies to current understanding of platelet biology and potential novel therapeutic targets. Chapter 2 details mass spectrometry-based proteomic technologies and applications in evaluation of platelet post-translational modifications. Chapter 3 covers the essentials of sample preparation with an emphasis on platelet research applications.

The second part of the book includes up-to-date reviews of the application of proteomic technologies to the study of the

platelet proteome and subproteomes, including platelet signaling (Chapter 4), platelet membrane (Chapter 5), platelet granules, organelles, and releasates (Chapter 6), platelet microparticle sub-proteomes (Chapter 7), and COFRADIC analysis of the total platelet proteome (Chapter 8).

The final part of the book is somewhat disparate, broadly covering integrated “omics” approaches in the context of platelet-associated disorders. Chapter 9 focuses on Serial Analysis of Gene Expression of platelets and megakaryocytes and the opportunities provided by next generation sequencing. Chapter 10 reviews microarray analysis of the platelet transcriptome and the benefits of combined transcriptomic and proteomic approaches for the study of platelets. Chapter 11 provides an overview of model systems for functional genomics studies of platelets to elucidate the function of novel platelet proteins, illustrated with reference to genetic manipulation of zebrafish, cell culture, and murine models. Chapter 12 introduces the concept of systems biology approaches and application to the study of congenital and acquired defects in platelet function, which give rise to bleeding disorders. Chapter 13 reviews the potential for proteomics to improve transfusion medicine, with particular emphasis on optimizing the production, processing, and storage of platelet concentrates. The final chapter provides a broad review of recent cardiovascular proteomic studies, largely focusing on heart and vascular proteomics.

Each of the chapters is written by experts in the field and provides an up-to-date, clear, and comprehensive review of the individual areas of interest to the authors. Although each individual chapter provides an excellent source of information, the book as a whole lacks some overall coherence in the way the chapters have been put together, with some repetition of information in some chapters. Nonetheless, as a whole, the book provides a valuable source of information for those new to the field of platelets and/or proteomics, although the more technology-based chapters may be somewhat inaccessible to those totally unfamiliar with proteomics. Experienced researchers looking for an up-to-date and comprehensive review of this rapidly developing field will find this book a valuable resource.