
Preface

Skin is our largest organ, easily available for observation and manipulation. Indeed, the sustained research efforts over the past decades led to the accumulation of a relevant knowledge on the skin structure and physiology as well as on the pathogenesis of cutaneous diseases. Thus, skin research attracts increasingly larger numbers of investigators from both clinical and fundamental disciplines because of the relevance of the cutaneous physiological and physiopathological processes, the availability of advanced imaging methods, ingenious functional assays and disease models, and the development of skin-targeted therapeutic approaches.

The aim of *Molecular Dermatology: Methods and Protocols* is to provide a collection of reliable state-of-the-art protocols covering a wide spectrum of techniques and experimental models. Specific molecular assays and disease models as well as overviews of diagnostic and research areas relevant to molecular dermatology are presented in the 30 chapters of this volume. Following an introduction to molecular dermatology in Chapter 1, the next two review chapters deal with molecular diagnostic algorithms and basic diagnostic methods for autoimmune and genetic skin disorders. The Chapters 4–8 describe novel imaging techniques used to visualize the molecular architecture of cell–cell junctions, the epidermal Langerhans cells, lymph node lymphangiogenesis, human papillomavirus infection, and dermal particle penetration. Chapter 9 summarizes the state of the art of the analysis of cutaneous somatic mosaicism. Chapters 10 and 11 present the proteomic analysis and microRNA profiling in keratinocytes, while several assays to study cell death are detailed in Chapter 12. Assays for studying autoantibody pathogenicity and intra- and subepidermal cleavage formation are presented in Chapters 13 and 14, respectively. Methods for analysis of carcinoma cell invasion and isolation of melanoma cells and of immune cells infiltrating melanoma tumors are depicted in Chapters 15, 16 and 17, respectively. A tissue engineering approach to replicate the development of skin fibrosis is described in Chapter 19. Chapters 20–28 encompass animal models for various skin conditions. Finally the last two chapters present emerging molecular therapies for skin disorders.

We would like to thank all the contributors, who are leading researchers in the field and developers or expert users of the presented methods, for providing their protocols for this volume. We would like to take the opportunity to thank Dr. John Walker, the Editor-in-Chief of the *Methods in Molecular Biology* series, for the continued support.

We hope you enjoy this volume of *Methods in Molecular Biology*.

Freiburg, Germany

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