

Practical Aspects of Cosmetic Testing

Joachim W. Fluhr

Editor

Practical Aspects of Cosmetic Testing

How to Set up a Scientific Study in Skin
Physiology

Second Edition



Springer

Editor

Joachim W. Fluhr
Charité – Universitätsmedizin, Berlin
Berlin, Germany

ISBN 978-3-030-44966-7 ISBN 978-3-030-44967-4 (eBook)
<https://doi.org/10.1007/978-3-030-44967-4>

© Springer-Verlag Berlin Heidelberg 2011

© Springer Nature Switzerland AG 2020

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors, and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, expressed or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Preface to the Second Edition

Skin physiology assessment is moving from a descriptive approach to a deeper understanding of biophysical functions and their underlying molecular mechanisms in the stratum corneum, e.g., on epidermal barrier function, as well as on stratum corneum hydration. The research with noninvasive instruments now offers reliable and reproducible approaches for basic research and product testing in the pharmaceutical and cosmetic industry. The focus of standard instruments is the functional aspect. Innovative imaging devices offer a deeper understanding of underlying mechanisms.

The present book provides basic information regarding assessment of skin physiology, skin functions in controlled studies using noninvasive biophysical instruments. The framework of correctly planning, performing, and evaluating scientific studies is described in this edition. Almost all chapters from the first edition are updated and two new chapters are added. At this point, I would like to thank again all authors for their careful work to make this book happen. I also would like to thank Dr. Juliette R. Kleemann and Mr. Karthik Periyasamy from Springer Nature Publishing. Without their patient help this new edition would not have been possible. I trust this book finds its way again to young and eager scientists at the beginning of their research career and helps them to answer some of the practical questions that all scientists should have when using new technologies. Furthermore, I hope that the practical work will lead to exciting results, new ideas, and interesting hypothesis.

Berlin, Germany
February 2020

Joachim W. Fluhr

Preface to the First Edition

The idea of “practical guidebook” was born after a hands-on workshop where several participants asked about a recommendation for reading of practical aspects. The current handbooks offer a plethora of scientific overviews and cover the broad spectrum of noninvasive measurement devices for cosmetic skin testing. However, practical aspects of performing cosmetic aspects are not always covered. Also, the published guidelines do not always cover the day-to-day questions arising during the preparation, performance, and evaluation of clinical studies. The aim of the present book is to provide practical guidance for scientists, especially those new in the field or those who face practical problems with their studies. New lab members should have a useful first-to-read source at hand.

I would also like to honor some “cornerstones” in the development of modern biophysical instrumentation such as Rony Marks, Harvey Blank, Pierre Agache, Gary Grove, Jorgen Serup, Howard Maibach, Peter Elsner, Enzo Berardesca, Albert Kligman, and the most innovative company in the field, Courage & Khazaka. Some of them have played an important role in the development of my personal career.

I would like to thank all authors of this book. Without their dedicated contributions this project would not have been possible. Special thanks should go to Ms. Blasig, from Springer. She supported this project during its entire process with enthusiasm and dedication.

Albert Kligman had a saying, which I would like to keep in mind when starting and advancing in the field of biophysical assessment of skin functions: “A fool with a tool is still a fool.” Thus, the brain of the scientist should be active when performing and analyzing measurements. Hopefully, this book will fill the gap between the detailed scientific textbooks, original and review publications in international journals, and the practical hands-on training that needs to be integrated in the education of young scientists in cosmetic testing.

Berlin, Germany
October 2010

Joachim W. Fluhr

Contents

Part I Legal Aspects of Cosmetic Testing

1 Regulatory Aspects	3
Oliver Wunderlich	
2 Ethical Aspects of Cosmetic Testing	15
Hristo Petrov Dobrev	
3 Good Clinical Practice	27
Betsy Hughes-Formella, Nicole Braun, and Ulrike Heinrich	
4 Guidelines in Skin Testing	33
Joachim W. Fluhr, G. E. Piérard, and C. Piérard-Franchimont	
5 Claim Support: How to Create and Substantiate Claims	43
Sinéad Hickey and Stephen Barton	

Part II General Aspects of Cosmetic Testing

6 Testing Laboratory	65
Oliver Wunderlich	
7 Research Staff	75
Ragna Williams	
8 Testing Population	79
Ragna Williams	
9 Testing Devices and Methods	85
Gabriel Khazaka	
10 Factors Influencing Measurements	91
Enzo Berardesca and Norma Cameli	
11 Study Design	103
Betsy Hughes-Formella, Nicole Braun, Ulrike Heinrich, and Carmen Theek	

12	Cosmetic Testing Report	111
	Hristo Dobrev	
Part III Practical Aspects of Testing: Typical Examples of Test Settings		
13	Moisturizers and Emollients	127
	Razvigor Darlenski and Joachim W. Fluhr	
14	Anti-aging and Anti-wrinkle Products	147
	Razvigor Darlenski, Theresa Callaghan, and Joachim W. Fluhr	
15	Products for Impure, Acne-like Skin	159
	Hristo Dobrev	
16	Assessment of Hair Morphology	177
	C. Thieulin, R. Vargiolu, and Hassan Zahouani	
17	Skin Color and Pigmentation	189
	Ammitzboell Elisabeth	
18	Characterization of Sunscreens: Determination of the SPF	197
	Juergen Lademann, Joachim W. Fluhr, and Martina C. Meinke	
19	Practical Aspects of Shampoo and Conditioner Testing	207
	Trefor Evans	
20	Antiperspirants and Deodorants	229
	Razvigor Darlenski and Joachim W. Fluhr	
21	Hair Growth	239
	Tobias W. Fischer	
22	Sensory Perception	259
	Gregor B. E. Jemec	
23	Novel Methods for In Vivo Skin Structure Visualization	265
	Giovanni Pellacani, Stefania Guida, and Silvana Ciardo	
24	Assessment of Pruritus and Sensitive Skin	289
	Flavien Huet and Laurent Misery	
25	Practical Use and Significance of Transepidermal Water Loss Measurements	297
	Truus Roelandt and Jean-Pierre Hachem	
26	Compliance Check with On-Site Measurements: Advanced Ways in Product Testing	305
	Gabriel Khazaka	
	Index	311