

# Introduction

*Cosmetics & Toiletries* magazine ran a column entitled “Biotechnology and Cosmetics” from 2002-2004. Larry Rheins, PhD, then founder and executive vice president of DermTech International of San Diego, California, was the column editor. In his introduction to the first column “On Launching a Biotechnology Column” (January 2002), Rheins wrote:

*On the 27<sup>th</sup> anniversary of the dawn of biotechnology, the worlds of biology, medicine and agriculture have been changed forever. The combined efforts of Herbert Boyer at the University of California, San Francisco and Stanley Cohen at Stanford in 1978 led to the first transgenic creation — E. coli bacterium containing the human insulin gene — introducing a new way of looking at and treating disease. This discovery was soon followed by the advent of the polymerase chain reaction (PCR) in 1982, setting the stage for the multitude of biological and health-care discoveries and inventions that soon followed.*

*The discoveries of tissue plasminogen activator (TPA) for heart attacks, PSA tests for early diagnosis of prostate cancer, genetically modified resistant crops and, recently, the cloning of mice and sheep, represent a large sphere of products for the biotechnology industry. With the recent mapping of the human genome, the practice of medicine, pharmaceutical drug manufacturing, and even the cosmetics and personal care industry have entered a new frontier for product innovation.*

*The past 27 years have not been without controversy, however. Although the majority of American consumers are more accepting of biotechnology-derived products than their European counterparts (Consumer Acceptance of Biotechnology, Spring 2000, Paul B. Thompson, PhD), much unease and outright opposition do exist. Concerns run the gamut from environmental safety to human health and ethics. Several European groups are lobbying for mandatory labeling of food containing genetically modified products. Awareness and apprehension have to some degree polarized the marketplace into pro- and anti-biotechnology “camps.”*

*This column represents an effort to present and better understand the evolution of biotechnology and cosmetics. In it we will address such diverse issues as tissue engineering as a source of new raw ingredients, recombinant DNA technology and manufacturing of botanical products, and molecular approaches for product safety and claims testing including the possibility of genetically individualized cosmetic products.*

*As we all learn to adjust to the prospect of human cloning and genetically modified crops, the biotechnology revolution is here, forever changing how we interact with the world around us. Looking forward, one can envision a cosmetics and personal care industry deeply embracing the development of products based on the science of the human genome, which at the end of the day will provide consumers with superior products for their ever-changing and special needs. As new technologies emerge, we will try to better understand their potential impact on our industry.*

Although the column ended in 2004, the impact of biotechnology on the cosmetic industry continues, and *Cosmetics & Toiletries* still publishes papers on the subject in its pages. In addition, *Cosmetics & Toiletries* magazine's sister publications *Perfumer & Flavorist* and *Global Cosmetic Industry (GCI)* publish insightful articles relating to biotechnology.

This book brings together in one volume almost 40 papers from the last five years which give an overview of biotechnology and cosmetics, and tackle such subjects as biotechnology and the skin; biotechnology and aging; biotechnologically interesting ingredients including flavors, fragrances and pigments; and finally regulation and testing considerations. We hope the reader will find this compilation thought-provoking and a "jump-off" point for his or her future work.

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**Editors' Note:** *Each chapter has been edited from its original publication for style consistency, but otherwise remains mostly unchanged from its original publication in *Cosmetics & Toiletries*, *Perfumer & Flavorist* or *GCI* magazines. Some author affiliations and/or company information may have changed since the initial publication. While every attempt has been made to note changes, the publisher accepts no responsibility or liability for any inaccuracies or omissions. The original month, year and publication is noted at the end of each chapter.*