### JOURNAL OF COSMETIC SCIENCE The Official Journal of the Society of Cosmetic Chemists

Publishing technical papers on topics of interest to cosmetic scientists since 1947

PUBLISHED BY



SOCIETY OF COSMETIC CHEMISTS SERVING GREATER NORTH AMERICA SINCE 1945

WWW.SCCONLINE.ORG/JOURNAL

## sederma

#### **CRODAROM**

By 2030 we will be Climate, Land and People Positive

## Sustainability Requires Positive Impact - A Digital Conference Experience

Climate change and population growth are putting increasing demand on the Earth's natural resources. Tackling these challenges requires real change and it's critical for us to work together, collaborating and partnering across the industry to take action.

## Want to understand how you can implement, execute or accelerate your commitment to a more sustainable future?

CRODA

Sit back and prepare to join industry leaders, technical experts, and sustainability pioneers for two days of educational sessions and exciting conversations.

We'll explore together, joined by thought leaders from the industry, how to achieve, create, make and deliver solutions to some of the biggest challenges the world is facing and deliver a world that is **Climate, Land and People Positive by 2030**.

Purchased for the exclusive use of nofirst nolast (unknown) From For Media Library & Resource Contex (ibrary we glime.org) Registration Now Open! When: September 9-10, 2020 Where: Your Desk Register Here >





## Journal of Cosmetic Science

The Official Journal of the Society of Cosmetic Chemists

Journal Editor:	Paolo Giacomoni, PhD, Consultant to the Skin Care Industry
Associate Editor:	Trefor Evans, PhD, TRI-Princeton   Hair Expert
	K.P. Ananthapadmanabhan, PhD, College of Pharmacy,

University of Cincinnati | Skin Expert

	Q
President:	Mindy Goldstein, PhD, Mindy S. Goldstein, PhD Consulting
Vice President:	Liz Streland, Croda, Inc.
Vice President-Elect:	Michelle Hines, PhD, Mary Kay, Inc.
Secretary:	Yulia Park, PhD, Amway Corporation
Treasurer:	Mark Chandler, ACT Solutions Corporation
Executive Director/CEO:	Erica L. O'Grady, CAE, Society of Cosmetic Chemists HQ



© Copyright 2020 by the Society of Cosmetic Chemists. Permission is granted to readers and nonprofit libraries acting for them for fair use of the material contained in this Journal. Permission is further granted to quote from this Journal in scientific works with the customary acknowledgment of the source. Consent from EACH OF THE ORIGINAL AUTHORS along with notification to the Society of Cosmetic Chemists is required to reprint a figure, table or other excerpt. The republication, systematic or multiple reproduction of any material in this Journal (including abstracts) is permitted under written license from the Society of Cosmetic Chemists. The Society of Cosmetic Chemists may also require that permission must be obtained from EACH OF THE AUTHORS. Address inquiries to the Editor.

SUBSCRIPTION: JOURNAL OF COSMETIC SCIENCE, the Official Journal of the Society of Cosmetic Chemists, is published six times per year with January/February, March/April, May/June, July/August, September/October, November/December issues. Yearly subscription price is \$250.00 for 1-10 users, \$350 for 11-50 users, \$490 for 51-100 users and \$686 for 100+ users. JOURNAL OF COSMETIC SCIENCE, the Official Journal of the Society of Cosmetic Chemists, is a registered trademark of the Society of Cosmetic Chemists.

**POSTMASTER, MEMBERS AND SUBSCRIBERS:** Send address changes to The Society of Cosmetic Chemists, 14 Wall Street, Suite 1620, New York, NY 10005.

RESPONSIBILITY FOR STATEMENTS PUBLISHED: The Society of Cosmetic Publication Publication Publication 1500, Fax: ( From: SCC Media Library & Resource Center (library.scconline.org)

responsibility for statements or opinions advanced by contributors to this Journal.

Missing issues will not be supplied if claims are received more than 60 days after the date of the issue, or if loss was due to failure to give notice of change of address. The JCS cannot accept responsibility for foreign delivery when its records indicate shipment was made.

EDITORS AND PUBLISHERS: Abstracts or digests of articles not exceeding 400 words may be published, duly credited to the author and JOURNAL OF COSMETIC SCIENCE, the Official Journal of the Society of Cosmetic Chemists. AUTHORS: When using illustrations or quotations taken from copyrighted publications, authors must get written permission from the copyright holder to reproduce the same.

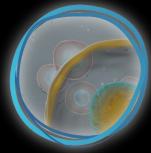
PAGE CHANGES: The authors of a manuscript will no longer be assessed a page or color photograph charge for printed manuscripts. Any material set into type but ordered deleted from the publication at the page proof stage must also be paid for by the author. These changes will be invoiced to the senior author at the time of publication.

MANUSCRIPTS: Manuscripts should be prepared in accordance with "Information for Authors," which can be found at the end of this issue.

Periodicals postage paid at New York, New York and additional mailing offices.

Publication office: 14 Wall Street, Suite 1620, New York, NY 10005 (212) 668-1500, Fax: (212) 668-1504. Email: journal@scconline.org





# WE'RE STILL ON!

## December 15-16, 2020 | Sheraton NY Times Square

www.scconline.org/annualmeeting2020

## SAVE THE DATE

Interested in exhibiting? Visit www.scconline.org/call4posters







### Journal of Cosmetic Science

The Official Journal of the Society of Cosmetic Chemists Volume 71 No. 4 | July/August 2020

### ORIGINAL ARTICLES

#### **Introductory Remarks**

Paolo U. Giacomoni | pp. 187

#### **Regular Application of Sunscreen Can Prevent Skin Cancer**

Adèle C. Green | pp. 191

#### Formulation of Sunscreens for Optimal Efficacy

Dominique Moyal, Thierry Passeron, Martin Josso, Stéphane Douezan, Véronique Delvigne, Sophie Seité | pp. 199

#### Importance of DNA Repair: Recent Advances

Daniel B. Yarosh, Angela Tewari | pp. 209

#### **Comparison of Skin Photoprotection by Pigmentation and Sunscreens**

Antony R. Young | pp. 217

#### Impact of Sunscreen Regulations in the United States on Suncare Development

Nadim A. Shaath | pp. 227