Special Issue

Breaking Barriers: Microneedles in Therapeutics and Diagnostics

Message from the Guest Editors

This Special Issue welcomes contributions that highlight recent advances in microneedle design, fabrication, and application, with a focus on platforms that enable the precise, targeted, and painless delivery of small molecules, biologics, and vaccines. We welcome original research and reviews covering solid, coated, dissolving, and hollow microneedles and hybrid systems that integrate sensing, controlled release, or smart feedback features. In addition, this Special Issue aims to explore challenges in clinical translation, including regulatory hurdles, manufacturing scalability, and stability concerns. We particularly seek papers that cover topics such as transdermal delivery enhancements (e.g., heat, ultrasound), skin interface optimization, and diagnostic sampling using microneedles. By uniting themes of precision, innovation, and patient-centric design, this Special Issue aims to capture the current momentum in microneedle research and demonstrate how these tiny tools are breaking barriers in both therapeutic and diagnostic landscapes—transforming the future of personalized medicine, painless treatment, and on-skin technology.

Guest Editors

Dr. Satish Rojekar

Center for Translational Medicine and Pharmacology, Department of Pharmacological Sciences, Icahn School of Medicine at Mount Sinai, 1 Gustave L. Levy Pl, New York, NY 10029, USA

Dr. Harsha Jain

Department of Pharmaceutical Sciences and Experimental Therapeutics, College of Pharmacy, University of Iowa, Iowa City, IA 52242, USA

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Micromachines
Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland
Tel: +41 61 683 77 34
micromachines@mdpi.com

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Editor-in-Chief

Prof. Dr. Ai-Qun Liu
1. Department of Electrical and Electronic Engineering, The Hong Kong Polytechnic University, Hong Kong, China
2. School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore 639798, Singapore

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