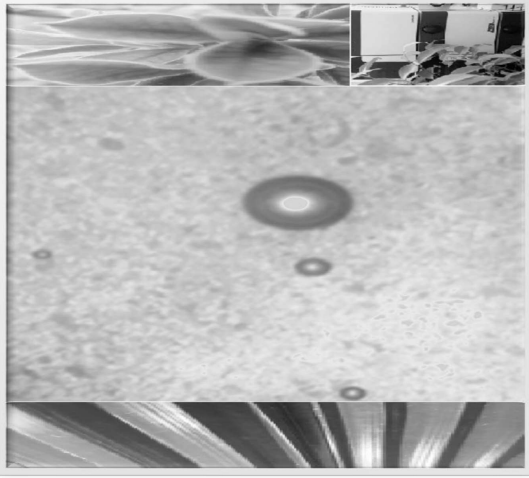




**Cambridge
Scholars
Publishing**

Nanotechnology in Phytopharmaceuticals



***Nanotechnology
in Phytopharmaceuticals***

Edited by

Tarique Mahmood

Arshiya Shamim

Mohammed Haris Siddiqui

Farogh Ahsan

Bringing together expert writings from diligent authors in the fields of nanomedicines, nanopharmaceuticals and herbal nanosceuticals, this book pragmatically covers pharmacological, clinical, safety and regulatory aspects of herbal nanoproducts. It will assist curious minds and researchers in delving into, and capturing, holistic knowledge on this intriguing subject.



Dr. Tarique Mahmood is a professor and Head of the Department of Pharmacy at Integral University Lucknow, India. He is a researcher in the development of herbal drugs and polyherbal formulations.



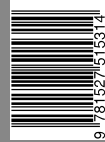
Dr. Arshiya Shamim is an associate professor at the Department of Pharmacy at Integral University Lucknow, India. She has extensively studied and published research work on herbal drugs and the pharmacological role of phytoconstituents.



Professor Mohammad Haris Siddiqui is the Director of the Integral Institute of Agricultural Science and Technology at Integral University Lucknow, India. He holds a doctorate in biotechnology, and has twenty years' research experience.



Dr. Farogh Ahsan is an associate professor at the Department of Pharmacy at Integral University Lucknow, India. He is the author of a number of journal articles talking about advanced developments of herbal drugs. His main area of research interest is ethnopharmacological screening of various herbs for cardiovascular disorders.



978-1-5275-1531-4
www.cambridgescholars.com
Cover images and design
© Tarique Mahmood, 2023

TABLE OF CONTENTS

Chapter I.....	1
Nanotechnology in Phytopharmaceuticals	
<i>Saba Parveen, Mohammad Shariq, Tarique Mahmood, Farogh Ahsan, Arshiya Shamim, Rufaida Wasim, Reshu Tiwari and Vaseem Khan</i>	
Chapter II.....	22
Drug Delivery and Pharmacokinetics of the Nanotechnology-Based Health Technique: Current and Future	
<i>Roshan Kumar and Purabi Saha</i>	
Chapter III	29
Safety and Regulatory Aspects of Nano Phytomedicines	
<i>Md. Rageeb Md. Usman, Snehal S. Abhang and Monalidilip Sonawane</i>	
Chapter IV	54
Biomedical Applications of Novel Drug Delivery Systems for Natural Plant Extracts for Antiviral Activity	
<i>Purabi Saha and Roshan Kumar</i>	
Chapter V	60
Herbal-Nano Cosmeceuticals: A Blessing for Good Skincare	
<i>Dr. Reshu Tiwari, Mohd Haris Siddiqui, Rufaida Wasim and Aditya Singh</i>	
Chapter VI	99
Collision of Nanotechnology in the Recent Market of Herbal Drugs	
<i>Md. Rageeb Md. Usman and Kunal S. Surwade</i>	
Chapter VII.....	106
Metallic Nanocarriers in the Delivery of Phytomedicines	
<i>Laxmi Devi, Poonam Kushwaha, Tarique Mahmood Ansari and Ashish Kumar</i>	
Glossary.....	118
Bibliography.....	125

CHAPTER VII

METALLIC NANOCARRIERS IN THE DELIVERY OF PHYTOMEDICINES

LAXMI DEVI¹, POONAM KUSHWAHA*¹,
TARIQUE MAHMOOD ANSARI¹
AND ASHISH KUMAR²

*¹FACULTY OF PHARMACY, INTEGRAL UNIVERSITY,
LUCKNOW, UTTAR PRADESH- 226 026, INDIA

¹GOVERNMENT MEDICAL COLLEGE, JALAUN, ORAI,
UTTAR PRADESH-285 001, INDIA

Abstract

Phytomedicines derived from plants have a wide range of pharmacological applications in a variety of diseases. One of the most important advantages of phytoconstituents is their low toxicity and adverse effects. However, their therapeutic efficacy is hampered by low solubility, permeability, and specificity in the target region. As a result, novel drug delivery systems are being developed employing a variety of nanoformulation methodologies to overcome these limitations and provide consistent drug delivery at the targeting location in the optimal concentration as well as increased therapeutic efficacy. Novel drug delivery systems are one example of such approaches (NDDS). In comparison to alternative options, using herbal formulations for NDDS is more advantageous. The utilization of inorganic nanoparticles of plant extract is an important idea for the herbal formulations. These are used to achieve the targeted administration of the formulation, which influences the location and enhances its bioavailability. The constituents and extracts used in natural formulations demonstrate sustained release, enhanced stability, increased therapeutic efficacy, and toxicity prevention due to such novel drug delivery systems. The fundamental motivation for developing alternative drug delivery systems is