



# Evolution of Nanoformulations in Pharmaceutical Science

Kaushal Kumar  
*Editor*

● DeepScience  
;

# Evolution of Nanoformulations in Pharmaceutical Science

**Kaushal Kumar**

Department of Pharmacy, MJP Rohilkhand University, Bareilly  
(U.P.), India



**DeepScience**

*Published, marketed, and distributed by:*

Deep Science Publishing, 2025  
USA | UK | India | Turkey  
Reg. No. MH-33-0523625  
[www.deepscienceresearch.com](http://www.deepscienceresearch.com)  
[editor@deepscienceresearch.com](mailto:editor@deepscienceresearch.com)  
WhatsApp: +91 7977171947

ISBN: 978-93-7185-408-5

E-ISBN: 978-93-7185-096-4

<https://doi.org/10.70593/978-93-7185-096-4>

Copyright © Kaushal Kumar, 2025.

**Citation:** Kumar, K. (2025). *Evolution of Nanoformulations in Pharmaceutical Science*. Deep Science Publishing. <https://doi.org/10.70593/978-93-7185-096-4>

This book is published online under a fully open access program and is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License (CC BY-NC 4.0). This open access license allows third parties to copy and redistribute the material in any medium or format, provided that proper attribution is given to the author(s) and the published source. The publishers, authors, and editors are not responsible for errors or omissions, or for any consequences arising from the application of the information presented in this book, and make no warranty, express or implied, regarding the content of this publication. Although the publisher, authors, and editors have made every effort to ensure that the content is not misleading or false, they do not represent or warrant that the information-particularly regarding verification by third parties-has been verified. The publisher is neutral with regard to jurisdictional claims in published maps and institutional affiliations. The authors and publishers have made every effort to contact all copyright holders of the material reproduced in this publication and apologize to anyone we may have been unable to reach. If any copyright material has not been acknowledged, please write to us so we can correct it in a future reprint.

## **Preface**

Nanotechnology is transforming the future of pharmaceutical sciences, offering smarter, safer, and more effective drug delivery systems. **“Evolution of Nano formulations in Pharmaceutical Science – Volume I”** captures this exciting journey, highlighting innovations in targeted therapy, controlled release, and biocompatible platforms.

This volume reflects the collective effort of passionate scholars whose contributions add depth and value to the book. I extend heartfelt thanks to **Abushan Khan, Prashant Kumar, Rajat Kumar, Ayushi Singh, Sashin Kumar, Utkarsh, and Deepshika** for their dedication and innovative insights.

I hope this work inspires researchers, academicians, and professionals to explore new horizons in nano pharmaceuticals and contribute to advancing global healthcare.

**Dr. Kaushal Kumar**

Editor

Faculty, Department of Pharmacy

MJP Rohilkhand University, Bareilly (U.P.), India

# Table of Content

<b>1 Nanomaterial: A New Approach for Target Drug Therapy.....</b>	<b>1</b>
<b>2 Nanoparticle: First entrant of Nano formulations.....</b>	<b>22</b>
<b>3 Self-Nanoemulsifying Drug Delivery System.....</b>	<b>39</b>
<b>4 Carbon Nanotubes: Benchmark in Evolution.....</b>	<b>53</b>
<b>5 Nanotechnology Meets lipids science: Liposomes from Discovery to Development.....</b>	<b>65</b>
<b>6 Niosomes: Renaissance in Nano formulation.....</b>	<b>87</b>
<b>7 Nano formulation for targeting of anti-cancerous drug.....</b>	<b>103</b>
<b>8 Smart Nano formulations: The Integration of AI and ML in Design and Development.....</b>	<b>126</b>

## **Chapter 1: Nanomaterial: A New Approach for Target Drug Therapy.**

**Mr. Rajat Kumar Bharti**

**Research Scholar**

**Department of Pharmacy, MJP Rohilkhand University, Bareilly, U.P. India**

**[rajatkumar.bharti20@gmail.com](mailto:rajatkumar.bharti20@gmail.com) | Corresponding Author**

**Dr. Kaushal Kumar**

**Assistant Professor**

**Department of Pharmacy, MJP Rohilkhand University, Bareilly, U.P. India**

**[saxenakaushal11@gmail.com](mailto:saxenakaushal11@gmail.com)**

### **Affiliations:**

**Research Scholar, MJP Rohilkhand University, India**

**Assistant Professor, MJP Rohilkhand University, India**