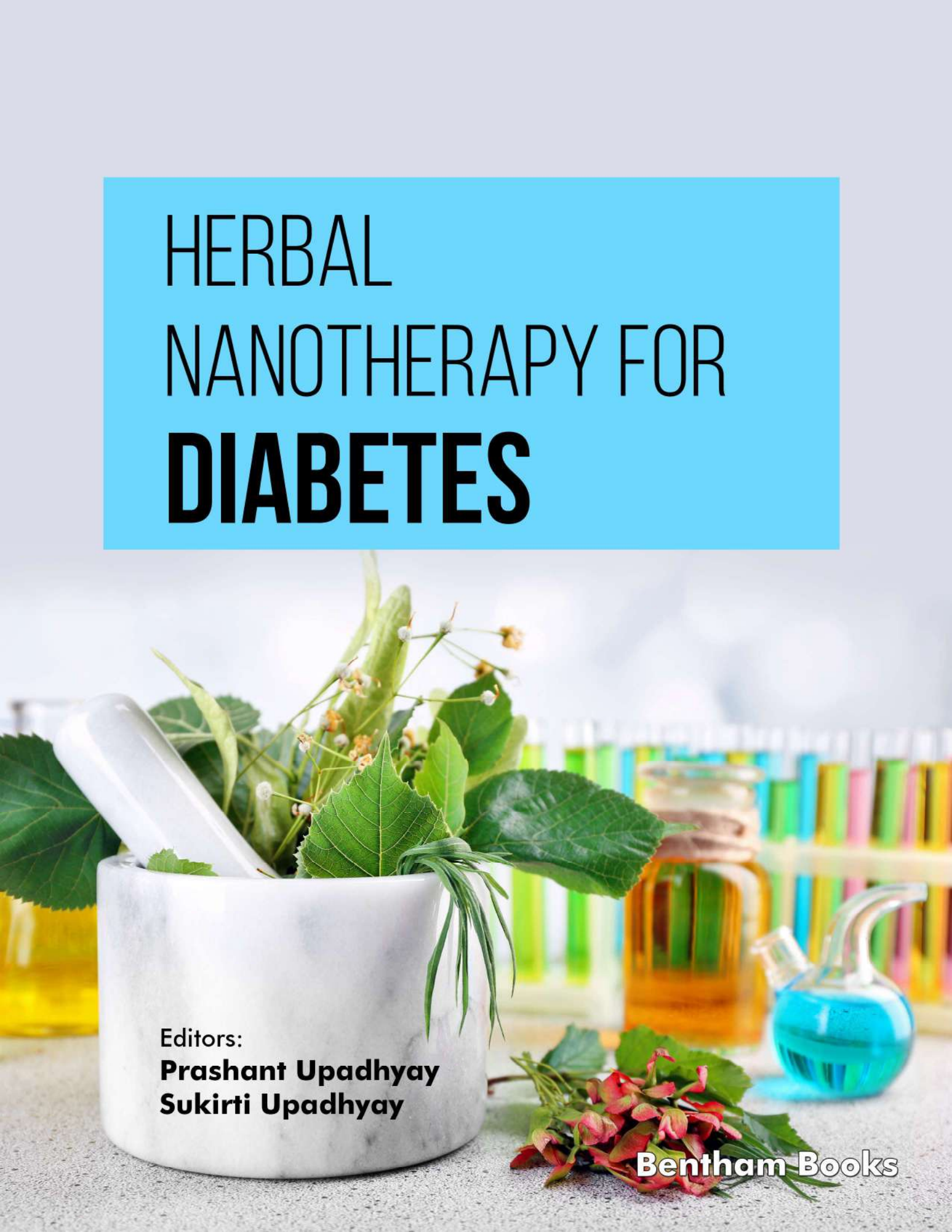


HERBAL NANOTHERAPY FOR **DIABETES**



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Bentham Books

Herbal Nanotherapy for Diabetes

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ISBN (Online): 979-8-89881-108-2

ISBN (Print): 979-8-89881-109-9

ISBN (Paperback): 979-8-89881-110-5

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First published in 2025.

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FOREWORD

Diabetes, a complex and multifactorial disease, has become a major public health concern worldwide. The increasing prevalence of diabetes, coupled with the limitations and side effects of conventional treatments, has necessitated the exploration of innovative and complementary approaches to diabetes management.

Herbal medicine, with its rich history and diverse array of bioactive compounds, has emerged as a promising adjunctive therapy for diabetes. However, the poor bioavailability and limited solubility of herbal extracts have hindered their therapeutic efficacy.

The integration of herbal medicine with nanotechnology has revolutionized the field of drug delivery research focusing on diabetes, enabling the development of herbal nanoparticles with improved bioavailability, targeted delivery, and controlled release. Herbal nanotherapy has shown tremendous promise in enhancing the therapeutic efficacy of herbal extracts while minimizing their side effects.

This book provides a comprehensive and authoritative overview of herbal nanotherapy for diabetes, covering the principles, design, and development of herbal nanoparticles, as well as their preclinical and clinical evaluation. The contributors, renowned experts in their fields, have meticulously compiled the latest research and developments in this rapidly evolving area.

I am confident that this book will serve as a valuable resource for researchers, clinicians, and students interested in the field of herbal nanotherapy and its applications in diabetes management. It is my hope that this work will inspire further research and innovation, ultimately leading to the development of more effective and safer treatments for diabetes.

Sincerely,

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PREFACE

This book aims to provide a comprehensive overview of herbal nanotherapy for diabetes, covering the principles, design, and development of herbal nanoparticles, as well as their preclinical and clinical evaluation. Diabetes, a chronic and debilitating metabolic disorder, has become a global health concern, affecting millions of people worldwide. Despite significant advances in conventional treatments, diabetes management remains a challenging task, with many patients experiencing inadequate glycemic control, side effects, and compromised quality of life.

In recent years, herbal medicine has gained significant attention as a complementary or alternative approach to managing diabetes. The rich biodiversity of medicinal plants offers a vast array of bioactive compounds with potential antidiabetic properties. However, the poor bioavailability, limited solubility, and lack of targeting of these herbal extracts have hindered their therapeutic efficacy.

Nanotechnology has emerged as a powerful tool to overcome these limitations, enabling the development of herbal nanoparticles with improved bioavailability, targeted delivery, and controlled release. Herbal nanotherapy, a fusion of herbal medicine and nanotechnology, has shown tremendous promise in enhancing the therapeutic efficacy of herbal extracts while minimizing their side effects.

We hope that this work will serve as a valuable resource for researchers, clinicians, and students interested in the field of herbal nanotherapy and its applications in diabetes management. This book also explains the burning metabolic disorder, diabetes, and its curative aspects. The use of phytochemicals in diabetes care is well documented in this book. The nanotherapeutic approach in the efficient delivery of phytochemicals has been overviewed and the mechanism of study is also explained. So, this book paved the way for overcoming challenges and advancements of nano therapy in diabetes.

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CHAPTER 1**Introduction to Herbal Nano Therapy:
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Abstract: Herbal medicines have served humanity for numerous generations all across the world. Current methods in phytochemical and phytopharmacological sciences base the clinical applicability of numerous medicinal plants on the composition of active compounds and how much of these compounds are present in samples. Numerous therapeutic compounds such as flavonoids, tannins along terpenoids exist as water-soluble substances yet they have limited potential for absorption. Multiple barriers prevent these compounds from penetrating cell membranes or taking absorption or crossing cell membrane barriers because of their large molecular size and poor absorption and inability to cross cell membranes. This causes them to have low bioavailability and reduced efficacy. Plant extracts fail to enter clinical practice due to these circumscribing factors. Researchers have extensively recommended using nanotechnology to overcome the obstacles related to herbal medicine delivery. Nanoscale technology increases the efficacy of plant extracts by reducing the amount of administration required while reducing side effects and producing therapeutic advantages. Nanocarriers maintain active components at their best concentrations during therapy while guiding them to specific destinations. Treatment methods that exist in the conservative healthcare system typically do not achieve these standards. This section evaluates both nanotechnology principles and their use in herbal drug delivery systems. The drug delivery system using herbal nanotechnology remains essential for diabetes management because polymeric and lipid nanoparticles, liposomes, dendrimers, and niosomes show superior performance than traditional oral hypoglycaemic agent treatments.

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