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Editors

Mucosal Delivery of Drugs and Biologics in Nanoparticles



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Preface

The last two decades have seen a significant increase in nanotechnology research for drug and vaccine delivery for various diseases. However, the promise of nanotechnology as a tool for delivering therapeutic agents and their clinical translation has been slow. The delivery of nanoparticles by the mucosal route of administration further complicates their safety and efficacy due to mucosal barriers and variable clearance rates. Their complex nature and the requirement of novel characterization techniques have made the regulatory approval of products containing nanoparticles difficult. We have arranged this book into three parts with each section discussing various aspects of nanotechnology.

Part I of the book encompasses chapters that will provide the reader with a basic understanding of nanomedicine in drug delivery and the different characterization methods used for nanomedicine, which is often challenging in order to ensure their purity, safety, and effectiveness when administered by mucosal routes.

Part II of the book describes the various mucosal routes used for nanoparticle administration, their advantages and disadvantages, and the progress made in delivering nanoparticles using different mucosal routes. Individual chapters then focus on the buccal, respiratory, and oral routes of administration. The final chapter in this section discusses the role of nanoparticles in delivering vaccines and biologics and products that are currently undergoing human trials in the United States.

Part III of the book is devoted to the host-cell interaction with nanoparticles. A chapter discusses how these particles interact with epithelial and immune cells after mucosal delivery. Another chapter discusses the toxicity of nanoparticles to the host and the environment, while the final chapter discusses the biodistribution of nanoparticles after mucosal delivery.

We owe immensely to all the authors in this book who agreed to give their time and effort to write a chapter based on their experience in the nanotechnology field. We would not have successfully completed this book without their insight and enthusiasm.

Lastly, it was a pleasure working with various staff members at Springer Nature for the past 3 years on the preparation of this book. We are particularly grateful to Carolyn Spence, Sanjana Meenakshi Sundaram, and Cathrine Selvaraj for their contributions. We would also like to thank Dr. Yvonne Perrie, series editor of AAPS Advances in the Pharmaceutical Science Series, for giving us the opportunity to work on this volume. Although it was a long and sometimes challenging undertaking, it has also been an immensely rewarding experience. We thank them for helping us along the way and for their patience and understanding throughout this lengthy process.

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