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Nota di contenuto	Chapter 1. Introduction to Freeze Drying, its Operation, and the Different Types of Freeze Dryers -- Chapter 2. Development of the Freeze-Drying Cycle, Cryoprotectant Selection, and Characterization.- Chapter 3. New physical methods for characterization of freeze-dried goods -- Chapter 4. Impact of Freeze-Drying on Pharmaceutical Product's Morphology, Physical Characteristics, and In Vitro Release Kinetics -- Chapter 5. Stability of Colloidal Dispersions Using Freeze-Drying Technology -- Chapter 6. Progress and Challenges in Enhancing the Stability of Targeted Drug Delivery Vehicles.-Chapter 7. Use of

Freeze Drying for Pharmaceutical Microencapsulation -- Chapter 8.
Freeze drying of Pharmaceutical products for injectable and oral use --
Chapter 9. Palatalisation of pharmaceuticals using freeze-drying
technology -- Chapter 10. Solid-state delivery and stabilization of
therapeutic proteins using freeze-drying technology -- Chapter 11.
Using Freeze-Drying to Stabilize Formulations of Monoclonal
Antibodies -- Chapter 12. Freeze Drying of Vaccines to Increase
Immunity -- Chapter 13. Enhanced Preservation of Stem Cell-Derived
Extracellular Vesicles Through Freeze-Drying -- Chapter 14.
Development of a hydrogel-nanofibrous scaffold via freeze-drying --
Chapter 15. Freeze-drying: Increasing probiotic stability.

Sommario/riassunto

The book presents a comprehensive summary of the advances in methods, applications and challenges in Freeze-drying Technology for pharmaceutical product development. Freeze drying, sometimes referred to as lyophilization, is an essential method in biomedical and pharmaceutical industries that allows for extremely accurate preservation of sensitive biological components. This book highlights freeze drying operation, the different types of freeze-dryers, development of the freeze-drying cycle, and characterization of freeze-dried goods. It also explores the crucial connection between freeze drying and colloidal dispersions' stability, illuminating the complex interactions between formulation composition, processing variables, and stability of the final product. It focuses on the benefits of this method for stabilizing essential biopharmaceuticals such as probiotics, recombinant proteins and monoclonal antibodies by preventing aggregation and degradation and sustaining their therapeutic effectiveness for longer periods of time. Apart from the chemistry, operations and benefits, this book explores new possibilities for precisely and deeply describing freeze-dried products by discussing the most recent developments in analytical methods. The audience for this book will comprise of researchers, clinicians, graduate students, and professionals in biotechnology and pharmaceutical industries. This book also serves as a valuable resource for educators by providing them information that they can incorporate into their curricula for teaching pharmaceutical formulation and drug delivery.
