

1. Record Nr.	UNINA9910819132103321
Titolo	Nanotechnology and functional food : effective delivery of bioactive ingredients // edited by Cristina Sabliov, Hongda Chen, Rickey Yada
Pubbl/distr/stampa	West Sussex, England : , : Wiley Blackwell, , 2015 ©2015
ISBN	1-118-46217-3 1-118-46215-7
Descrizione fisica	1 online resource (405 p.)
Collana	IFT Press Series
Classificazione	TEC012000
Disciplina	664
Soggetti	Food - Biotechnology Bioactive compounds - Biotechnology Functional foods
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Title Page; Copyright Page; Contents; Contributors; Chapter 1 Introduction; Chapter 2 Nutrient absorption in the human gastrointestinal tract; 2.1 INTRODUCTION; 2.2 OVERVIEW OF THE GASTROINTESTINAL TRACT; 2.3 THE GASTROINTESTINAL TRACT; 2.4 MACRONUTRIENTS; 2.4.1 Carbohydrates; 2.4.2 Fats; 2.4.3 Proteins; 2.5 ALCOHOL; 2.6 MICRONUTRIENTS; 2.6.1 Fat-soluble vitamins; 2.6.2 Water-soluble vitamins; 2.7 WATER AND MINERALS; 2.7.1 Water; 2.7.2 Electrolytes; 2.7.3 Sodium; 2.7.4 Potassium; 2.7.5 Chloride; 2.7.6 Calcium; 2.7.7 Magnesium; 2.7.8 Phosphorus; 2.7.9 Sulfur; 2.8 TRACE MINERALS; 2.8.1 Iron 2.8.2 Zinc 2.8.3 Copper; 2.8.4 Manganese; 2.8.5 Selenium; 2.8.6 Chromium; 2.8.7 Iodine; 2.8.8 Fluoride; 2.9 PHYTOCHEMICALS; 2.9.1 Carotenoids; 2.9.2 Flavonoids; 2.10 IMPLICATIONS IN HEALTH AND DISEASE; 2.11 USE OF NANOPARTICLES TO ENHANCE ABSORPTION OF NUTRIENTS; References; Chapter 3 Cellular fate of delivery systems and entrapped bioactives; 3.1 CELLULAR FATE OF NANOPARTICLES - AN EXPERIMENTAL PERSPECTIVE; 3.1.1 Nanoparticle detection and quantification; 3.1.2 Effect of NP properties on cell uptake; 3.1.3 Fate of loaded NPs in the cell with implications on bioactive functionality

3.2 CELLULAR UPTAKE OF SMALL MOLECULES AND NPs BY MEMBRANE PENETRATION - A MOLECULAR SIMULATION PERSPECTIVE 3.2.1 Small molecules and drugs interacting with lipid bilayers; 3.2.2 Polymers and NPs interacting with lipid bilayers; 3.3 CONCLUSIONS; References; Chapter 4 Interfacial science and the creation of nanoparticles; 4.1 INTRODUCTION; 4.2 FUNDAMENTALS OF INTERFACIAL SCIENCE; 4.2.1 Equilibrium surface properties; 4.2.2 Dynamic surface properties; 4.2.3 Self-assembly and phase separation; 4.2.4 Interactions at the interface; 4.3 INTERFACIAL PROPERTIES IN NANOPARTICLE FORMATION 4.3.1 Lyotropic nanoparticles 4.3.2 Self-assembled nanoparticles; 4.4 INTERFACIAL EFFECTS IN DISTRIBUTION AND RELEASE; Acknowledgments; References; Chapter 5 Controlling properties of micro- to nano-sized dispersions using emulsification devices; 5.1 INTRODUCTION; 5.2 FUNDAMENTALS OF EMULSIFICATION PROCESSES; 5.3 CONVENTIONAL MECHANICAL EMULSIFICATION; 5.3.1 High-speed mixer; 5.3.2 Colloid mill; 5.3.3 High-pressure homogenizer (microfluidizer); 5.3.4 Ultrasonic homogenizer; 5.4 PREPARATION OF QUASI-MONODISPERSE EMULSIONS USING MEMBRANE EMULSIFICATION 5.5 PREPARATION OF MONODISPERSE EMULSIONS USING MICROFABRICATED EMULSIFICATION DEVICES 5.5.1 Microfluidic emulsification; 5.5.2 Microchannel emulsification; 5.5.3 Edge-based droplet generation emulsification; 5.6 EMULSION PROPERTIES AND APPLICATIONS; 5.7 CONCLUSIONS; References; Chapter 6 Delivery systems for food applications: an overview of preparation methods and encapsulation, release, and dispersion properties; 6.1 INTRODUCTION; 6.2 METHODS OF FABRICATING DELIVERY SYSTEMS AND THEIR TYPICAL DIMENSIONS; 6.2.1 Top-down methods; 6.2.2 Bottom-up methods 6.3 ENCAPSULATION EFFICIENCIES OF VARIOUS DELIVERY SYSTEMS

Sommario/riassunto

"This book explores the most up to date nano- and micro-delivery systems for food ingredients, including nanoemulsions, stabilized nanoemulsions, solid lipid nanoparticles, and polymeric nanoparticles. Chapters explore the different types of delivery systems, their properties and interactions with other food components, targeting mechanisms, and safety to the human body. Industrial and societal implications of use of nano- and micro-delivery systems for bioactive ingredients in functional foods are also covered. Continuing innovation in nano and micro-delivery systems for bioactives will underpin expanded consumer choice in functional foods and growth strategies for food companies in the 21st century. This book aims to provide the reader with the most up-to-date knowledge of modern delivery systems, options available, and the basic science critical to success in the marketplace. Topics to be covered include: Introduction. Importance of novel delivery systems for improved stability, controlled release, and targeting of bioactive components. Overview of different delivery systems to be used in functional foods. Bioactive food ingredients. Definition, health benefits, classification of bioactives. Challenges associated with free-form delivery of bioactives (i.e. bioavailability, stability, etc) Delivery system characteristics. Properties: Entrapment efficiency, size, release kinetics, charge, stability, bioavailability. Analysis methods: TEM, SEM, AFM, DLS, HPLC, bioavailability methods (cell and animal models). Delivery system interaction with other food components. Targeting strategies. Delivery system interaction with biological systems and safety. Delivery methods with case studies. Emulsions and double layer-emulsions with applications. Polymeric nanoparticles with applications. Coacervates (with example fish oil). Solid lipid nanoparticles with applications. Liposomes. Delivery from packaging. Probiotics delivery systems. Dendrimers as nanocarrier for antibacterial peptide. Multifunctional food grade nanofibers. Industrial

and societal implications. Safety of nanomaterials (high bioavailability, material selection, societal implications). Alteration of final product properties (sensorial properties, texture, color). Regulation for food nanotech. Product development and intellectual property. Future trends. Vision for nano and colloidal systems for delivery of bioactives.

--

"This book explores the most up to date nano- and micro-delivery systems for food ingredients, including nanoemulsions, stabilized nanoemulsions, solid lipid nanoparticles, and polymeric nanoparticles"

--
