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Nota di contenuto	Preparation methods for giant unilamellar vesicles / Rumiana Dimova, Pasquale Stano, Carlos M. Marques and Peter Walde -- Preparation and properties of giant plasma membrane vesicles and giant unilamellar vesicles from natural membranes / Joseph H. Lorent and Ilya Levental -- Protein reconstitution in giant vesicles / Matthias Garten, Daniel Levy and Patricia Bassereau -- GUVs with cytoskeleton / Tobias Hartel and Petra Schwille -- Understanding giant vesicles : a theoretical perspective / Reinhard Lipowsky -- Simulating membranes, vesicles, and cells / Thorsten Auth, Dmitry A. Fedosov and Gerhard Gompper -- Theory of vesicle dynamics in flow and electric fields / Petia M. Vlahovska and Chaouqi Misbah -- Particle-membrane interactions / Jaime Agudo-Canalejo, Reinhard Lipowsky -- Theory of polymer-membrane interactions / Fabrice Thalmann and Carlos M. Marques -- Application of optical microscopy techniques on giant unilamellar vesicles / Luis A. Bagatolli -- Mechanics assays of synthetic lipid membranes based on micropipette aspiration / Elisa Parra and David Needham -- Atomic force microscopy of giant unilamellar vesicles / Andreas Janshoff -- Manipulation and biophysical characterization of GUVs with an optical stretcher / Gheorghe Cojoc, Antoine Girot, Ulysse Delabre and Jochen Guck -- Vesicle fluctuation analysis / John Hjort Ipsen, Allan Grønhøj Hansen and Tripta Bhatia -- Using electric fields

to assess membrane material properties in GUVs / Rumiana Dimova and Karin A. Riske -- Creating membrane nanotubes from GUVs / Coline Prevost, Mijo Simunovic and Patricia Bassereau -- Measuring GUV adhesion / Kheya Sengupta and Ana Smith -- Phase diagrams and tie lines in GUVs / Matthew C. Blosser, Caitlin Cornell, Scott P. Rayermann and Sarah L. Keller -- Vesicle dynamics in flow: an experimental approach / Victor Steinberg and Michael Levan -- Membrane permeability measurements / Begona Ugarte-Uribe, Ana J. Garcia-Saez and Mireille M.A E. Claessens -- Lipid and protein mobility in GUVs / Begona Ugarte-Uribe, Kushal Kumar Das and Ana J. Garcia-Saez -- Shining light on membranes / Rosangela Itri, Carlos M. Marques and Mauricio S. Baptista -- Protein-membrane interactions / Eva M Schmid and Daniel A Fletcher -- Effects of antimicrobial peptides and detergents on GUVS / Karin A. Riske -- Lipid-polymer interactions: effect on GUVs shapes and behavior / Brigitte Pepin-Donat, Francois Quemeneur and Clement Campillo -- Polymersomes / Praful Nair, David Christian and Dennis E. Discher -- Giant hybrid polymer/lipid vesicles / Thi Phuong Tuyen Dao, Khalid Ferji, Fabio Fernandes, Manuel Prieto, Sebastien Lecommandoux, Emmanuel Ibarboure, Olivier Sandre and Jean-Francois Le Meins -- Giant unilamellar vesicles: from protocell models to the construction of minimal cells / Masayuki Imai and Peter Walde -- Encapsulation of aqueous two-phase systems and gels within giant lipid vesicles / Allyson M. Marianelli and Christine D. Keating -- Droplet-supported giant lipid vesicles as compartments for synthetic biology / Johannes P. Frohnmayer, Marian Weiss, Lucia T. Benk, Jan-Willi Janiesch, Barbara Haller, Rafael B. Lira, Rumiana Dimova, Ilia Plazman and Joachim P. Spatz.

Sommario/riassunto

Giant vesicles are widely used as a model membrane system, both for basic biological systems and for their promising applications in the development of smart materials and cell mimetics, as well as in driving new technologies in synthetic biology and for the cosmetics and pharmaceutical industry. The reader is guided to use giant vesicles, from the formation of simple membrane platforms to advanced membrane and cell system models. It also includes fundamentals for understanding lipid or polymer membrane structure, properties and behavior. Every chapter includes ideas for further applications and discussions on the implications of the observed phenomena towards understanding membrane-related processes. The Giant Vesicle Book is meant to be a road companion, a trusted guide for those making their first steps in this field as well as a source of information required by experts. Key Features A complete summary of the field, covering fundamental concepts, practical methods, core theory, and the most promising applications A start-up package of theoretical and experimental information for newcomers in the field Extensive protocols for establishing the required preparations and assays Tips and instructions for carefully performing and interpreting measurements with giant vesicles or for observing them, including pitfalls Approaches developed for investigating giant vesicles as well as brief overviews of previous studies implementing the described techniques Handy tables with data and structures for ready reference