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Autore	Popot Jean-Luc
Titolo	Membrane Proteins in Aqueous Solutions : From Detergents to Amphipols // by Jean-Luc Popot
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Nota di contenuto	From the Contents: Membrane proteins: functions, structures, environments -- Taking membrane proteins out of their natural environment -- Alternatives to detergents for handling membrane proteins in aqueous solutions -- Chemical structure and physical-chemical properties of amphipols.
Sommario/riassunto	Membrane proteins represent about one third of the proteins encoded in a cell's genome, and, because of their key physiological roles, more than half of drug targets. Detergents are traditionally used to extract proteins from membranes in order to make them amenable to the tools

of biochemistry and biophysics. However, detergent-solubilized proteins are generally unstable. This has led to the development of alternative, non-conventional surfactants, such as bicelles, nanodiscs, amphipathic peptides, fluorinated surfactants, and specially designed amphipathic polymers called 'amphipols'. These novel tools, mainly developed over the past 20 years, are revolutionizing handling membrane proteins in vitro for basic and applied research, as well as for such biomedical applications as drug screening or vaccination. This book, written by a specialist of membrane proteins and one of the creators of amphipols, describes the properties and uses of these novel molecules. It opens with general introductions on membrane proteins and their natural environment, detergents, the current status of membrane protein in vitro studies, a broad panorama of non-conventional surfactants and a discussion of their respective advantages and limitations, and the preparation and properties of amphipols and membrane protein/amphipol complexes. Topical chapters cover in vitro folding, cell-free synthesis and stabilization of membrane proteins, and such biophysical and biochemical applications as electron microscopy, Xray diffraction, NMR, optical spectroscopy, mass spectrometry, the whole range of solutions studies, proteomics, and such practical applications as membrane protein immobilization and drug screening and the use of amphipols in vivo for vaccination and drug delivery. Each topical chapter is introduced with a concise, up-to-date overview of how membrane proteins are currently studied using each individual technique, before offering an exhaustive coverage and in-depth discussion of the contribution of amphipols, and concluding with hands-on protocols written by everyday practitioners of each application. In addition to a comprehensive coverage of the properties and uses of non-conventional surfactants, this book therefore also offers a concise, accessible introduction to membrane protein biochemistry and biophysics. It is meant to be used both in basic and applied research laboratories and as a teaching help.
