



Advanced Technologies for Protein Complex Production and Characterization [

Vega, M. Cristina.,
editor

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Monografía

This book presents advanced expression technologies for the production of protein complexes. Since complexes lie at the heart of modern biology, the expression, purification, and characterization of large amounts of high-quality protein complexes is crucial for the fields of biomedicine, biotechnology, and structural biology. From co-expression in *E. coli*, yeast, mammalian and insect cells to complex reconstitution from individual subunits, this book offers useful insights and guidance for successful protein expressionists. Across several sections readers will discover existing opportunities for the production of protein complexes in bacterial systems (including membrane proteins and cell-free co-expression), methylotrophic and non-methylotrophic yeasts, protozoa (*Leishmania tarentolae* and *Dictyostelium discoideum*), baculovirus-infected insect cells, mammalian cells, plants and algae. Complex reconstitution from individually purified subunits or subcomplexes is discussed as a complementary strategy. A last section introduces briefly some of the biophysical and structural characterization techniques for macromolecular complexes using state-of-the-art solution scattering and nuclear magnetic resonance. This work is a guided tour over some of the most powerful and successful protein expression technologies, with a focus on co-expression and high-throughput applications. It is addressed to everyone interested in the production and characterization of macromolecular complexes, from university students who want an accessible description of the major co-expression systems to researchers in biomedicine and the life sciences seeking for an up-to-date survey of available technologies

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Contenido: Protein complex production from the drug discovery standpoint -- Choose a suitable expression host: a survey of available protein production platforms -- ACEMBL Tool-Kits for High-Throughput Multigene Delivery

and Expression in Prokaryotic and Eukaryotic Hosts -- Complex reconstitution and characterization by combining co-expression techniques in Escherichia coli with high-throughput -- Membrane protein production in E. coli for applications in drug discovery -- Cell-free Synthesis of Macromolecular Complexes -- A Bacillus megaterium system for the production of recombinant proteins and protein complexes -- Protein complex production in alternative prokaryotic hosts -- Production of Protein Complexes in Non-methylotrophic and Methylotrophic Yeasts -- Leishmania tarentolae for the Production of Multi-Subunit Complexes -- Alternative Eukaryotic Expression Systems for the Production of Proteins and Protein Complexes -- Fundamentals of baculovirus expression and applications -- The MultiBac Baculovirus / Insect Cell Expression Vector System for Producing Complex Protein Biologics -- Fundamentals of expression in mammalian cells -- Assembling multi-subunit complexes using mammalian expression -- Microalgae as solar-powered protein factories -- Strategies and methodologies for the co-expression of multiple proteins in plants -- Transient expression systems in plants -- Potentialities and constraints -- Complex reconstitution from individual protein modules -- Structural reconstruction of protein-protein complexes involved in intracellular signaling -- The use of small-angle scattering for the characterization of multi subunit complexes -- Application of nuclear magnetic resonance and hybrid methods to structure determination of complex systems. .

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