Modern research in biology increasingly relies on multiple techniques for describing structures and mechanisms. This book provides an overview of the contemporary integrated biology approaches for solving structures and understanding mechanisms of complex biological systems. It includes several methodology chapters discussing the current developments in the areas of cryo-electron microscopy (EM) and cryo-electron tomography (ET), computational biophysics, solution NMR spectroscopy, solid-state NMR spectroscopy and dynamic nuclear polarization (DNP), electron paramagnetic resonance (EPR), (photo-)chemically induced dynamic nuclear polarization (CIDNP), X-ray crystallography and small-angle X-ray and neutron scattering (SAXS/SANS). Several subsequent chapters demonstrate how these methods are used in synergy to address problems at the forefront of structural biology, with particular emphasis on examples where individual techniques are insufficient. Examples of biological systems include membrane proteins, viral protein assemblies, cytoskeleton protein assemblies, photosynthetic reaction centers, large enzyme complexes and whole cells.

The book is targeted to both the current practitioners of structural biology and scientists who are interested in entering the fields of structural biology or biophysical chemistry.

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