

PREFACE

Protein biochemistry continues to be an essential part of modern biological research. With the huge increase in genome sequencing, the sequences of most studied organisms are available, facilitating gene cloning, protein production, and the study of protein properties, structure, and function. Tremendous advances in heterologous expression of recombinant proteins have greatly increased our ability to produce proteins of interest. However, a protein must still be purified and characterized. This is particularly important if the gene is unknown.

Much has happened since the First Edition of the *Guide to Protein Purification* (Methods in Enzymology, Volume 182) was published in 1990. Major changes have occurred, including the explosion of genomics and proteomics, high-throughput expression/purification for the Protein Structure Initiative, protein target-based high throughput screening of chemicals to find new pharmaceuticals, a growing need to express and purify membrane proteins, the use of purification and solubilization tags, the systematic testing of refolding conditions to facilitate and optimize protein refolding, mass spectrometry analysis of post-translational modifications, and expression of recombinant proteins in non-bacterial hosts. These changes have necessitated significant advances in techniques, materials, reagents and equipment.

In the Second Edition of the *Guide to Protein Purification*, we have tried to identify the areas of greatest change in the last 20 years and to present authoritative reviews and methods that reflect the current best practice in each area of protein purification. First and foremost, we wanted these chapters to be educational and highly useful to the reader, and included typical best use protocols, cautions, technical tips, and limitations. While many of the chapters are by experts in academia, a significant number are by experts in certain areas in the biotechnology and pharmaceutical industry. We feel that high-level scientists in companies that use, develop, sell, or provide technical support for products in technical areas are particularly valuable in writing such chapters. We have encouraged such chapters and tried to ensure that they are even-handed and not focused entirely on the products of a particular company.

This Guide is a self-contained volume covering all the important procedures for purifying proteins as well as the more specialized techniques.

We hope that the Guide will be an invaluable resource and reference text for researchers new to protein purification as well as for the more experienced researchers, and that it will find an important place in every protein biochemistry laboratory.

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