Preface

The first edition of *Protein Purification Protocols* (1996), edited by Professor Shawn Doonan, rapidly became very successful. Professor Doonan achieved his aims of producing a list of protocols that were invaluable to newcomers in protein purification and of significant benefit to established practitioners. Each chapter was written by an experienced expert in the field. In the intervening time, a number of advances have warranted a second edition. However, in attempting to encompass the recent developments in several areas, the intention has been to expand on the original format, retaining the concepts that made the initial edition so successful. This is reflected in the structure of this second edition. I am indebted to Professor Doonan for his involvement in this new edition and the continuity that this brings.

Each chapter that appeared in the original volume has been reviewed and updated to reflect advances and bring the topic into the 21st century. In many cases, this reflects new applications or new matrices available from vendors. Many of these have increased the performance and/or scope of the given method. Several new chapters have been introduced, including chapters on all the currently used protein fractionation and chromatographic techniques. They introduce the theory and background for each method, providing lists of the equipment and reagents required for their successful execution, as well as a detailed description of how each is performed. The Notes section constitutes a reference guide on the issues and pitfalls that may be encountered and provides the means for circumventing or overcoming them effectively.

Around the time of the first edition, the concept of proteomics was being forged and has subsequently led to a rapid growth in a new and exciting area of protein isolation and analysis. Techniques such as two-dimensional gel electrophoresis have now entered the mainstream, not only in analysis, but also as a preparative technique for protein characterization. Even newer techniques combine with analytical chromatography as multidimensional separations of proteins and peptides. In combination with mass spectrometric techniques, these are now the most powerful methods for isolating proteins. *Protein Purification Protocols* reflects these developments, with chapters encompassing all the current thinking. In addition, since the advance of technology means that simple spectrometric detection is no longer the only option for separating proteins, the various methods for detecting proteins are covered.

Each chapter is designed to allow a particular step of a purification to be performed in isolation; however, it is understood that a number of steps may need to be run in sequence from initial sample fractionation (e.g., tissue homogenization) to chromatography and final polishing steps (e.g., buffer exchange). Our book's format allows for this, and the initial chapter addresses strategies that should place the various methodologies in context. At the end of the book it was also felt timely to include brief descriptions of how to scale-up purification methods and evaluate the purification of proteins for therapeutic use. These do not rigidly follow the regular pattern for the main body of protocols, but should give an insight into the strategies needed for different final applications.

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