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BOOK REVIEW

PROTEIN PURIFICATION

(From Molecular Mechanisms to Large Scale Processes)

M.R. Ladisch, R.C. Willson, C.C. Painton, S.E. Builder, Eds.

ACS Symposium Series 427, American Chemical Society,
Washington, D.C., 1989; hardbound, 280 pages, \$ 64.95

One reason why reviewers seldom wax enthusiastic about Proceedings volumes is that they are more like Journals than like books. Journal articles are not grouped together in any particular logical order, nor are Proceedings chapters. Thus Proceedings volumes, like Journals, are within their specialized subject rarely more than randomly instructive. The present Proceedings volume is no exception. The volume is based on "informal discussions" on protein purification, held in Houston in April 1989, and on a Symposium held at the 1989 fall National ACS Meeting in Miami in September 1989. Fifteen of its sixteen chapters treat various aspects of protein purification. Only chapter 3 deals with principles that are largely irrelevant to protein separation. It remains stymieing why it got included in this volume: any editor of a Journal on protein separation would have returned it to the author with advice to address it to a more appropriate Journal. This may however pinpoint one of the few differences between Proceedings volumes and Journals: once an invited speaker decides to treat matters that deviate substantially from the subject under discussion, it may be hard to stop him, particularly if he is reasonably famous.

The sixteen chapters of this volume comprise: 1) Large Scale Protein Purification: Introduction, by R.C. Willson, M.R. Ladisch; 2) Strategies for Large-Scale Protein Purification, by S.V. Ho; 3) Separation in Biotechnology: The Key Role, by E.N. Lightfoot; 4)

Peptide and Protein Partitioning in Aqueous Two-Phase Systems: Effect of Amino Acid Sequence, by A.D. Diamond, K. Yu, J.T. Hsu; 5) Protein Separation via Polyelectrolyte Complexation, by M.A. Strege, P.L. Dubin, J.S. West, C.D. Flinta; 6) Mechanisms of Protein Retention in Hydrophobic Interaction Chromatography, by B.F. Roettger, J.A. Myers, M.R. Ladisch, F.E. Regnier; 7. Anion Exchange Stationary Phase for β -Galactosidase, Bovine Serum Albumin and Insulin: Separation and Sorption Characteristics, by M.R. Ladisch, R.L. Hendrickson, K.L. Kohlmann; 8) Radial-Flow Affinity Chromatography for Trypsin Purification, by W.-C. Lee, G.-J. Tsai, G.T. Tsao; 9) Impact of Continuous Affinity-Recycle Extraction (CARE) in Downstream Processing, by N.F. Gordon et C.L. Cooney; 10) Novel Metal-Affinity Protein Separations, by S.-S. Suh, M.E. Van Dam, G.E. Wuenschell, S. Plunkett, F.H. Arnold; 11) Recovery of Recombinant Proteins by Immunoaffinity Chromatography, by P. Bailon, S.K. Roy; 12) Chelating Peptide-Immobilized Metal-Ion Affinity Chromatography, by M.C. Smith, J.A. Cook, T.C. Furman, P.D. Gesellchen, D.P. Smith, H. Hsiung; 13) Site-Specific Proteolysis of Fusion Proteins, by P. Carter; 14) Purification Alternatives for IgM (Human) Monoclonal Antibodies; by G.B. Dove, G. Mitra, G. Roldan, M.A. Shearer, M.-S. Cho; 15) Analytical, Preparative, and Large-Scale Zone Electrophoresis, by C.F. Ivory, W.A. Gobie, T.P. Adhi; 16) Applied Electric Fields for Downstream Processing, by S.R. Rudge, P. Todd.

There is a bit of everything in this volume. Not surprisingly, the chapters most relevant to actual protein purification tend to be written by scientists working in industry: chapters 2, 11, 12, 13, 14, with, in addition chapters 7 and 9 from Academic Institutes (Purdue University and M.I.T.). Two-phase aqueous partitioning is discussed in chapter 4, and to some extent in chapters 2 and 9. Affinity methods are treated in chapters 8, 9 and 11, and to some degree in chapters 2, 10, 12 and 14. Chapter 5 deals with protein purification by complexation with oppositely charged polyelectrolytes, a process originally designated as complex coacervation. This should not be confounded with simple coacervation (as is done by the authors), because coacervation (without the adjective "complex") is a totally different phenomenon, of which two-phase aqueous partitioning is an example. Chapter 6 features modeling of hydrophobic interaction chromatography. Finally, chapters 15 and 16 deal with

electrokinetic methods which, however, are seldom as yet seriously applied to preparative protein separation.

This volume is recommended to all who wish to keep up-to-date in new trends in protein purification.

Carel J. van Oss