# PREFACE

The second edition of *Protein NMR Spectroscopy: Principles and Practice* reflects the continued rapid pace of development of biomolecular NMR spectroscopy since the original publication in 1996. While these developments will no doubt continue in the future, ensuring a ready need for additional monographs, the present time is auspicious for a new edition that incorporates important recent developments.

The most notable change in the second edition is evident on the cover: Mark Rance has been added as an author. In writing the first edition of *Protein NMR Spectroscopy: Principles and Practice*, the original authors benefited greatly from many "behind-the-scenes" discussions of NMR theory, instrumentation, and experimental methods with Mark. After publication, the original authors continued to have frequent discussions with Mark concerning improvements for the second edition. Accordingly, the original authors were delighted that, when work on the second edition began in earnest, Mark agreed to abandon his advisory role and become a co-author. Many of the strengths of the second edition of *Protein NMR Spectroscopy: Principles and Practice* are derived directly from his contributions.

The second edition of *Protein NMR Spectroscopy: Principles and Practice* includes two new Chapters: experimental techniques for investigating molecular conformational dynamics through spin relaxation are described in Chapter 8, and techniques applicable to larger

proteins and molecular complexes are described in Chapter 9. As a result, Chapter 8 in the first edition now is renumbered Chapter 10. The other Chapters have been revised to incorporate new techniques, including methods to measure residual dipole couplings and to utilize transverse relaxation optimized spectroscopy, as well as our own improved understanding of NMR spectroscopy.

As in the first edition of *Protein NMR Spectroscopy: Principles and Practice*, the second edition uses the small protein ubiquitin (MW = 8.6 kD) to demonstrate the majority of the experimental aspects of NMR spectroscopy. In the second edition, the protein calbindin $D_{28k}$ (MW = 30 kD), is used to demonstrate experimental techniques for proteins of molecular mass >20 kD. Details of sample preparation, resonance assignments, and structure determination of calbindin $D_{28k}$ have been reported [W. Lutz, E. M. Frank, T. A. Craig, R. Thompson, R. A. Venters, D. Kojetin, J. Cavanagh and R. Kumar (2003) *Biochem. Biophys. Res. Commun.* **303**, 1186–1192; R. A. Venters, L. M. Benson, T. A. Craig, K. H. Paul. D. R. Kordys, R. Thompson, S. Naylor, R. Kumar and J. Cavanagh (2003) *Anal. Biochem.* **317**, 59–66; D. J. Kojetin, R. A. Venters, D. R. Kordys, R. J. Thompson, R. Kumar and J. Cavanagh (2006) *Nat. Struct. Mol. Biol.* **13**, 641–647].

Although we wish that the second edition will be free of errors or inaccuracies, we recognize that readers undoubtedly will find mistakes (and hopefully communicate them to A. G. P. at agp6@columbia.edu). An errata page will be maintained at http://www.palmer.hs.columbia.edu/protein_nmr_spectroscopy.

We wrote the first edition of *Protein NMR Spectroscopy: Principles and Practice* to enable graduate students, postdoctoral scientists, and senior investigators to understand the unifying principles of NMR spectroscopy and to evaluate, implement and optimize experimental NMR techniques for their own research. We hope that the second edition continues to meet these objectives.

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