



Protein NMR Spectroscopy: Principles and Practice

By John Cavanagh, Wayne J. Fairbrother, III Arthur G. Palmer, Nicholas J. Skelton, Mark Rance

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Protein NMR Spectroscopy, Second Edition combines a comprehensive theoretical treatment of NMR spectroscopy with an extensive exposition of the experimental techniques applicable to proteins and other biological macromolecules in solution.

Beginning with simple theoretical models and experimental techniques, the book develops the complete repertoire of theoretical principles and experimental techniques necessary for understanding and implementing the most sophisticated NMR experiments.

Important new techniques and applications of NMR spectroscopy have emerged since the first edition of this extremely successful book was published in 1996. This updated version includes new sections describing measurement and use of residual dipolar coupling constants for structure determination, TROSY and deuterium labeling for application to large macromolecules, and experimental techniques for characterizing conformational dynamics. In addition, the treatments of instrumentation and signal acquisition, field gradients, multidimensional spectroscopy, and structure calculation are updated and enhanced.

The book is written as a graduate-level textbook and will be of interest to biochemists, chemists, biophysicists, and structural biologists who utilize NMR spectroscopy or wish to understand the latest developments in this field.

- Provides an understanding of the theoretical principles important for biological NMR spectroscopy
- Demonstrates how to implement, optimize and troubleshoot modern multi-dimensional NMR experiments
- Allows for the capability of designing effective experimental protocols for investigations of protein structures and dynamics
- Includes a comprehensive set of example NMR spectra of ubiquitin provides a reference for validation of experimental methods

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Editorial Review

Review

"This volume is a comprehensive introduction to the methodology required for NMR studies of proteins."
JOURNAL OF MAGNETIC RESONANCE

"Protein NMR Spectroscopy: Principles and Practice covers a huge range of topics related to NMR....A fine two-semester course could be built on this very thorough book. Any student currently using NMR could benefit from the Cavanagh et al. text, which provides an in-depth explanation that is suitable as a resource for even a knowledgeable spectroscopist."

--NATURE STRUCTURAL BIOLOGY

"All in all, I find the book very, very good. It will fill an important void in the literature/material available in the NMR field.....There are many 'hands on' secrets that will be very valuable to those beginning in the field as well as those who are 'old hands.' It has a distinct advantage over other books in that it was written as a whole, freshly from cover to cover; it is NOT a collection of published articles hurriedly put together with a nice binding."

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"Along with detailed explanations of the mechanisms underlying the modern NMR experiments, the book also brings some "order" to the bewildering array of novel NMR pulse sequences. To practitioners of biomolecular NMR, it will prove invaluable for years to come."

--STRUCTURE

About the Author

Dr. Cavanagh is the William Neal Reynolds Distinguished Professor of Biochemistry at North Carolina State University. He is an expert in protein structural biology, particularly in how bacteria are able to protect themselves. Dr. Cavanagh received his Ph.D. in Chemistry/NMR spectroscopy from the University of Cambridge in 1988. He has held positions as a Senior Research Associate at The Scripps Research Institute, Director of Structural Biology at the Wadsworth Center (New York State Department of Health), Associate Professor of Biomedical Sciences (SUNY) and Professor of Chemistry (Purdue). Since 2000 he has been Professor of Biochemistry in the Department of Molecular & Structural Biochemistry at North Carolina State University. Dr. Cavanagh has served on numerous NIH and NSF grant review panels and is currently a permanent member of the MSFB Study Section at NIH. He has authored over 100 peer-reviewed research publications and has been awarded the Foulerton Gift & Binmore Kenner Fellowship of the Royal Society (1990), the Fullsome Award (1996), the NC State University Alumni Associations Outstanding Research Award (2005) and Entrepreneur of the Year- NC State University (2012). He runs the Jimmy V-NCSU Cancer Therapeutics Training Program, was Assistant Vice Chancellor for Research at NC State from 2012-2014 and is the co-founder and Chief Scientific Officer of Agile Sciences Inc., a Raleigh based biotechnology company focusing on antibiotic resistance.

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