

Kurt Wüthrich: Publications

1. Wüthrich, K. und Fallab, S. (1963) *Chimia* **17**, 356–358.
Bestimmung der Bildungskonstanten der o-Phenyldiamin-Kupfer(II)-Komplexe in wässriger Lösung.
2. Wüthrich, K. und Fallab, S. (1964) *Helv. Chim. Acta* **47**, 1440–1448.
Mechanismus der Kupfer(II)-katalysierten Autoxydation von o-Phenyldiamin.
3. Wüthrich, K. und Fallab, S. (1964) *Helv. Chim. Acta* **47**, 1609–1616.
Einfluss verschiedener Liganden auf den Mechanismus der Kupfer(II)-katalysierten Autoxydation von o-Phenyldiamin.
4. Wüthrich, K., Loeliger, H. und Fallab, S. (1964) *Experientia* **20**, 599–601.
Elektronenspinresonanzmessungen zur Untersuchung von Kinetik und Mechanismus von Cu²⁺-katalysierten Reaktionen.
5. Wüthrich, K. (1965) *Helv. Chim. Acta* **48**, 779–790.
Elektronenspinresonanz-Untersuchungen von VO²⁺-Komplexverbindungen in wässriger Lösung.
6. Wüthrich, K. (1965) *Helv. Chim. Acta* **48**, 1012–1017.
Elektronenspinresonanz-Untersuchungen von VO²⁺-Komplexverbindungen in wässriger Lösung II.
7. Wüthrich, K. (1966) *Helv. Chim. Acta* **49**, 1400–1406.
Über die Elektronenspinresonanzspektren einiger Cu²⁺-Komplexe in wässriger Lösung.
8. Wüthrich, K. and Connick, R.E. (1967) *Inorg. Chem.* **6**, 583–590.
Nuclear magnetic resonance relaxation of oxygen-17 in aqueous solutions of vanadyl perchlorate and the rate of elimination of water molecules from the first coordination sphere.
9. Wüthrich, K., Shulman, R.G. and Peisach, J. (1968) *Proc. Natl. Acad. Sci. USA* **60**, 373–380.
High resolution proton magnetic resonance spectra of sperm whale cyanometmyoglobin.
10. Wüthrich, K. and Connick, R.E. (1968) *Inorg. Chem.* **7**, 1377–1388.
Nuclear magnetic resonance studies of the coordination of vanadyl complexes in solution and the rate of elimination of coordinated water molecules.
11. Wüthrich, K., Shulman, R.G. and Yamane, T. (1968) *Proc. Natl. Acad. Sci. USA* **61**, 1199–206.
Proton magnetic resonance studies of human cyanomethemoglobin.
12. Wüthrich, K., Shulman, R.G., Wyluda, B.J. and Caughey, W.S. (1969) *Proc. Natl. Acad. Sci. USA* **62**, 636–643.
Proton magnetic resonance studies of porphyrin iron(III) cyanides.
13. Shulman, R.G., Ogawa, S., Wüthrich, K., Yamane, T., Peisach, J. and Blumberg, W.E. (1969) *Science* **165**, 251–257.
The absence of “heme–heme” interactions in hemoglobin.

14. Shulman, R.G., Wüthrich, Yamane, T., Antonini, E. and Brunori, M. (1969) *Proc. Natl. Acad. Sci. USA* **63**, 623–628.
Nuclear magnetic resonances of reconstituted myoglobins.
15. Wüthrich, K. (1969) *Proc. Natl. Acad. Sci. USA* **63**, 1071–1078.
High resolution proton nuclear magnetic resonance spectroscopy of cytochrome c.
16. Connick, R.E. and Wüthrich, K. (1969) *J. Chem. Phys.* **51**, 4506–4508.
 ^{17}O nuclear magnetic relaxation in aqueous solutions of diamagnetic metal ions.
17. Wüthrich, K., Meiboom, S. and Snyder, L.C. (1970) *J. Chem. Phys.* **52**, 230–233.
Nuclear magnetic resonance spectroscopy of bicyclobutane.
18. Wüthrich, K. and Shulman, R.G. (1970) *Physics Today* **23**, 43–50.
Magnetic resonance in biology.
19. Yamane, T., Wüthrich, K., Shulman, R.G. and Ogawa, S. (1970) *J. Mol. Biol.* **49**, 197–202.
Proton magnetic resonance studies of cyanoferrihemoglobins from different species.
20. Wüthrich, K., Shulman, R.G., Yamane, T., Wyluda, B.J., Hügli, B.J. and Gurd, F.R.N. (1970) *J. Biol. Chem.* **245**, 1947–1953.
High resolution proton magnetic resonance studies of cyanoferrimyoglobins and alkylated derivatives from different species.
21. Shulman, R.G., Wüthrich, K., Yamane, T., Patel, D.J. and Blumberg, W.E. (1970) *J. Mol. Biol.* **53**, 143–157.
Nuclear magnetic resonance determination of ligand-induced conformational changes in myoglobin.
22. Wüthrich, K. (1970) *Structure and Bonding* **8**, 53–121.
Structural studies of hemes and hemoproteins by nuclear magnetic resonance spectroscopy.
23. Wüthrich, K. (1970) *Chimia* **24**, 409–418.
Studien der räumlichen Struktur von Proteinmolekülen mit magnetischer Kernresonanzspektroskopie.
24. Shulman, R.G., Ogawa, S., Wüthrich, K., Yamane, T., Peisach, J. and Blumberg, W.E. (1970) in *Physical Problems in Biological Systems*, (C. de Witt and J. Matricon, eds.) pp. 235–249, Gordon and Breach, New York.
The absence of “heme-heme” interactions in hemoglobin.
25. Wüthrich, K. (1970) dans *Physique et Chimie, Numéro Spécial Annuel 1970: La Biophysique*, pp. 18–25, Editions de l’Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris.
Structures électroniques dans les hémoprotéines: études par résonance magnétique nucléaire.
26. Wüthrich, K., Meraldi, J.P., Tun-Kyi, A. and Schwyzer, R. (1971) in *Proc. 1st Eur. Biophysics Congress*, Vol. I, pp. 93–95, Verlag der Wiener Medizinischen Akademie.
Structural studies by nuclear magnetic resonance of a cationspecific peptide.
27. Shulman, R.G., Wüthrich, K. and Peisach, J. (1971) in *Probes of Structure and Function of Macromolecules and Membranes*, Vol. II: *Probes of Enzymes and Hemoproteins* (B. Chance, T. Yonetani and A.S. Mildvan, eds.) pp. 195–204, Academic Press, New York.

High resolution proton magnetic resonance studies of myoglobin.

28. Wüthrich, K. (1971) in *Probes of Structure and Function of Macromolecules and Membranes*, Vol. II: *Probes of Enzymes and Hemoproteins* (B. Chance, T. Yonetani and A.S. Mildvan, eds.) pp. 465–486, Academic Press, New York.
High resolution proton NMR studies of the coordination of the heme iron in cytochrome c.
29. Wüthrich, K., Aviram, I. and Schejter, A. (1971) *Biochim. Biophys. Acta* **253**, 98–103.
Structural studies of modified cytochromes c by nuclear magnetic resonance spectroscopy.
30. Ogawa, S., Shulman, R.G., Wüthrich, K. and Yamane, T. (1971) in *Magnetic Resonances in Biological Research* (C. Franconi, ed.) pp. 97–106, Gordon and Breach, New York.
NMR studies of the role of the heme group during the cooperative oxygenation of hemoglobin.
31. Wüthrich, K., Shulman, R.G., Yamane, T. and Ogawa, S. (1971) in *Genetical, Functional and Physical Studies of Hemoglobins* (T. Arends, G. Bemski and R.L. Nagel, eds.) pp. 73–79, Karger, Basel.
Studies of structure–function correlations in hemoglobin by nuclear magnetic resonance.
32. Winterhalter, K.H. and Wüthrich, K. (1972) *J. Mol. Biol.* **63**, 477–482.
Structural investigations of modified haemoglobins by nuclear magnetic resonance spectroscopy.
33. Keller, R.M., Aviram, I., Schejter, A. and Wüthrich, K. (1972) *FEBS Lett.* **20**, 90–92.
Evidence for pentacoordinated iron (II) in carboxymethylated cytochrome c.
34. Wüthrich, K. and Shulman, R.G. (1971) *Uspekhi Fizicheskikh Nauk* **105**, 707–720.
Magnetic resonance in biology. (Russisch)
35. Wüthrich, K., Keller, R.M., Brunori, M., Giacometti, G., Huber, R. and Formanek, H. (1972) *FEBS Lett.* **21**, 63–66.
Similarities of the heme environment in vertebrate and non-vertebrate oxygen-binding hemoproteins.
36. Donzel, B., Kamber, B., Wüthrich, K. and Schwyzer, R. (1972) *Helv. Chim. Acta* **55**, 947–961.
A chiral cystine disulfide group without inherent optical activity in the long-wavelength region.
37. Keller, R.M., Wüthrich, K. and Debrunner, P.G. (1972) *Proc. Natl. Acad. Sci. USA* **69**, 2073–2075.
Proton magnetic resonance reveals high spin iron (II) in ferrous cytochrome P450_{cam} from *Pseudomonas putida*.
38. Wüthrich, K., Tun-Kyi, A. and Schwyzer, R. (1972) *FEBS Lett.* **25**, 104–108.
Manifestation in the ¹³C NMR spectra of two different molecular conformations of a cyclic pentapeptide.
39. Meraldì, J.P., Schwyzer, R., Tun-Kyi, A. and Wüthrich, K. (1972) *Helv. Chim. Acta* **55**, 1962–1973.
Conformational studies of cyclic pentapeptides by proton magnetic resonance spectroscopy.
40. Schwyzer, R., Grathwohl, C., Meraldì, J.P., Tun-Kyi, A., Vogel, R. and Wüthrich, K. (1972) *Helv. Chim. Acta* **55**, 2545–2549.
The solution conformation of cyclo-glycyl-L-prolyl-glycyl-glycyl-L-prolyl-glycyl.

41. Keller, R.M. and Wüthrich, K. (1972) *Biochim. Biophys. Acta* **285**, 326–336.
The electronic g-tensor in cytochrome b₅ : high resolution proton magnetic resonance studies.
42. Grathwohl, C., Schwyzer, R., Tun-Kyi, A. and Wüthrich, K. (1973) *FEBS Lett.* **29**, 271–274.
Carbon-13 NMR spectra of cyclo-glycyl-L-prolyl-glycyl-glycyl-L-prolyl-glycyl: assignment of the carbonyl resonances.
43. Wüthrich, K. (1973) in *Vorträge des 9. Kolloquiums über NMR-Spektroskopie* (R. Kosfeld, J. Mansfeld und P. Puhr-Westerheide, eds.) Vol. 1, pp. 71–91, Rheinisch-Westfälische Technische Hochschule Aachen.
Proton and carbon-13 NMR studies of peptides and proteins.
44. Masson, A. and Wüthrich, K. (1973) *FEBS Lett.* **31**, 114–118.
Proton magnetic resonance investigation of the conformational properties of the basic pancreatic trypsin inhibitor.
45. Wüthrich, K. and Baumann, R. (1973) *Helv. Chim. Acta* **56**, 585–596.
Hyperfine shifts of the ¹³C NMR in low spin iron(III) porphyrin complexes.
46. Wüthrich, K. (1973) *Naturwissenschaften* **60**, 221–230.
Magnetische Kernresonanzspektroskopie in der Biologischen Forschung.
47. Keller, R.M., Pettigrew, G.W. and Wüthrich, K. (1973) *FEBS Lett.* **36**, 151–156.
Structural studies by proton NMR of cytochrome c-557 from *Crithidia oncopelti*.
48. Keller, R.M., Groudinsky, O. and Wüthrich, K. (1973) *Biochim. Biophys. Acta* **328**, 233–238.
Proton magnetic resonances in cytochrome b₂ core: structural similarities with cytochrome b₅.
49. Wüthrich, K., Keller, R.M. and Baumann, R. (1973) in *Dynamic Aspects of Conformation Changes in Biological Macromolecules* (C. Sadron, ed.) pp. 151–163. Reidel, Dordrecht.
Proton and carbon-13 nuclear magnetic resonances in hemes and hemoproteins: new aspects for the investigation of the molecular conformations.
50. Merald, J.P., Moeschler, H., Schwyzer, R., Tun-Kyi, A. et Wüthrich, K. (1973) *J. Physique* **34**, C8-41–C8-43.
Etudes de la conformation de pentapeptides cycliques par la résonance magnétique nucléaire.
51. Wüthrich, K. and Baumann, R. (1973) *Ann. New York Acad. Sci* **222**, 709–721 (1973).
Recent developments in the investigation of the paramagnetic centers in low spin ferric hemoproteins: carbon-13 hyperfine shifts in iron porphyrin complexes.
52. Wüthrich, K. and Baumann, R. (1974) *Helv. Chim. Acta* **57**, 336–350.
Hyperfine shifts of the ¹³C NMR in protoporphyrin IX iron(III) dicyanide and deuteroporphyrin IX iron(III) dicyanide.
53. Grathwohl, C. and Wüthrich, K. (1974) *J. Magn. Reson.* **13**, 217–225.
Carbon-13 NMR of the protected tetrapeptides TFA-Gly-Gly-L-X-L-Ala-OCH₃, where X stands for the 20 common amino acids.
54. Wüthrich, K. (1974) *Experientia* **30**, 577–585.

Nuclear magnetic resonance in protein research.

55. Wüthrich, K. (1974) *Pure Appl. Chem.* **37**, 235–248.
Studies of the molecular conformations in proteins by ^1H and ^{13}C NMR spectroscopy.
56. Wüthrich, K. and Grathwohl, C. (1974) *FEBS Lett.* **43**, 337–340.
A novel approach for studies of the molecular conformations in flexible polypeptides.
57. Wüthrich, K. and Keller, R.M. (1973) in *Symposial Papers of the IVth International Biophysics Congress*, Vol. 2, pp. 722–735, Academy of Sciences of the USSR, Pushino.
Recent developments in the investigation of the paramagnetic centers in low spin ferric hemoproteins.
58. Wüthrich, K., Grathwohl, C. and Schwyzer, R. (1974) in *Peptides, Polypeptides and Protein* (E.R. Blout, F.A. Bovey, M. Goodman and N. Lotan, eds.) pp. 300–307, Wiley, New York. *Cis*, *trans*, and nonplanar peptide bonds in oligopeptides: ^{13}C NMR studies.
59. Wüthrich, K. (1974) *Pure Appl. Chem.* **40**, 127–139.
Carbon-13 NMR in haems and haemoproteins.
60. Grathwohl, C., Tun-Kyi, A., Bundi, A., Schwyzer, R. and Wüthrich, K. (1975) *Helv. Chim. Acta* **58**, 415–423.
 ^1H and ^{13}C NMR studies of the molecular conformations of cyclo-tetraglycyl.
61. Wüthrich, K. and Wagner, G. (1975) *FEBS Lett.* **50**, 265–268.
NMR investigations of the dynamics of the aromatic amino acid residues in the basic pancreatic trypsin inhibitor.
62. Bundi, A., Grathwohl, C., Hochmann, J., Keller, R.M., Wagner, G. and Wüthrich, K. (1975) *J. Magn. Reson.* **18**, 191–198.
Proton NMR of the protected tetrapeptides TFA-Gly-Gly-L-X-L-Ala-OCH₃, where X stands for one of the 20 common amino acids.
63. Wüthrich, K., Hochmann, J., Keller, R.M., Wagner, G., Brunori, M. and Giacometti, G. *J. Magn. Reson.* **19**, 111–113 (1975).
 ^1H NMR relaxation in high spin ferrous hemoproteins.
64. Llinás, M., Wüthrich, K., Schwotzer, W. and von Philipsborn, W. (1975) *Nature* **257**, 817–818.
 ^{15}N nuclear magnetic resonance of living cells.
65. Wüthrich, K. (1975) in *Proc. 10th FEBS Meeting*, pp. 21–24, Federation of European Biochemical Societies.
Nuclear magnetic resonance in enzyme research.
66. Wagner, G. and Wüthrich, K. (1975) *J. Magn. Reson.* **20**, 435–445.
Proton NMR studies of the aromatic residues in the basic pancreatic trypsin inhibitor (BPTI).
67. Wagner, G., DeMarco, A. and Wüthrich, K. (1975) *J. Magn. Reson.* **20**, 565–569.
Convolution difference ^1H NMR spectra at 360 MHz of the basic pancreatic trypsin inhibitor.
68. Brown, L.R., DeMarco, A., Wagner, G. and Wüthrich, K. (1976) *Eur. J. Biochem.* **62**, 103–107.

A study of the lysyl residues in the basic pancreatic trypsin inhibitor using ^1H nuclear magnetic resonance at 360 MHz.

69. Wüthrich, K. (1976) *NMR in Biological Research: Peptides and Proteins*. North Holland, Amsterdam.
70. Wagner, G. and Wüthrich, K. (1976) in *Protides of the Biological Fluids – 23rd Colloquium* (H. Peeters, ed.) pp. 189–193, Pergamon, Oxford.
 ^1H NMR studies of the dynamics of the solution conformation of the basic pancreatic trypsin inhibitor (BPTI).
71. Wüthrich, K., Wagner, G. and Tschesche, H. (1976) in *Protides of the Biological Fluids – 23rd Colloquium* (H. Peeters, ed.) pp. 201–204, Pergamon, Oxford.
Comparative ^1H NMR studies of the solution conformation of the cow colostrum trypsin inhibitor (CTI), the trypsin inhibitor of *helix pomatia* (HPI) and the basic pancreatic trypsin inhibitor (BPTI).
72. Keller, R.M., Groudinsky, O. and Wüthrich, K. (1976) *Biochim. Biophys. Acta* **427**, 497–511.
Contact-shifted resonances in the ^1H NMR spectra of cytochrome b₅: resonance identification and spin density distribution in the heme group.
73. Bundi, A., Andreatta, R., Rittel, W. and Wüthrich, K. (1976) *FEBS Lett.* **64**, –129.
Conformational studies of the synthetic fragment 1–34 of human parathyroid hormone by NMR techniques.
74. Wagner, G., DeMarco, A. and Wüthrich, K. (1976) *Biophys. Struct. Mech.* **2**, 139–158.
Dynamics of the aromatic amino acid residues in the globular conformation of the basic pancreatic trypsin inhibitor (BPTI) I: ^1H NMR studies.
75. Hetzel, R., Wüthrich, K., Deisenhofer, J. and Huber, R. (1976) *Biophys. Struct. Mech.* **2**, 159–180.
Dynamics of the aromatic amino acid residues in the globular conformation of the basic pancreatic trypsin inhibitor (BPTI) II: semi-empirical energy calculations.
76. Wüthrich, K. (1975) in *Metalloprotein Studies Utilizing Paramagnetic Effects of the Metal Ions as Probes* (M. Kotani and A. Tasaki, eds.) pp. 151–179, The Taniguchi Foundation, Osaka, Japan.
The heme groups as natural NMR probes of hemoprotein conformation.
77. Möschler, H.J., Tun-Kyi, A., Meraldi, J.P., Wüthrich, K. und Schwyzer, R. (1976) *Helv. Chim. Acta* **59**, 2196–2200.
Synthese deuterierter Derivate diastereomerer Cyclopentapeptide für die Konformationsanalyse.
78. Wüthrich, K. and DeMarco, A. (1976) *Helv. Chim. Acta* **59**, 2228–2235.
Preferred spatial arrangement of the aromatic side chains in linear oligopeptides containing tyrosine.
79. Grathwohl, C. and Wüthrich, K. (1976) *Biopolymers* **15**, 2025–2041.
The X–Pro peptide bond as an NMR probe for conformational studies of flexible linear peptides.
80. Grathwohl, C. and Wüthrich, K. (1976) *Biopolymers* **15**, 2043–2057.
NMR studies of the molecular conformations in the linear oligopeptides H–(L-Ala)_n–L-Pro–OH.
81. Keller, R.M., Wüthrich, K. and Pecht, I. (1976) *FEBS Lett.* **70**, 180–184.

Structural studies of cytochrome c-551 by ^1H NMR spectroscopy at 360 MHz.

82. DeMarco, A. and Wüthrich, K. (1976) *J. Magn. Reson.* **24**, 201–204.
Digital filtering with a sinusoidal window function: an alternative technique for resolution enhancement in FT NMR.
83. Wüthrich, K. and Baumann, R. (1976) *Org. Magn. Reson.* **8**, 532–535.
 ^{13}C spin relaxation studies of the basic pancreatic trypsin inhibitor.
84. Brown, L.R. and Wüthrich, K. (1977) *Biochim. Biophys. Acta* **464**, 356–369.
A spin label study of lipid oxidation catalyzed by heme proteins.
85. Keller, R.M., Wüthrich, K. and Schejter, A. (1977) *Biochim. Biophys. Acta* **491**, 409–415.
 ^1H NMR studies of the heme iron coordination in cytochrome c-552 from *Euglena gracilis*.
86. Keller, R.M. and Wüthrich, K. (1977) *Biochim. Biophys. Acta* **491**, 416–422.
 ^1H NMR studies at 360 MHz of the aromatic amino acid residues in ferrocytochrome c-552 from *Euglena gracilis*.
87. Bundi, A. and Wüthrich, K. (1977) *FEBS Lett.* **77**, 11–14.
 ^1H NMR titration shifts of amide proton resonances in polypeptide chains.
88. Llinás, M., Meier, W. and Wüthrich, K. (1977) *Biochim. Biophys. Acta* **492**, 1–11.
A carbon-13 spin lattice relaxation study of alumichrome at 25.1 MHz and 90.5 MHz.
89. Lauterwein, J., Wüthrich, K., Schweitz, H., Vincent, J.P. and Lazdunski, M. (1977) *Biochem. Biophys. Res. Comm.* **76**, 1071–1078.
 ^1H NMR studies of a neurotoxin and a cardiotoxin from *Naja mossambica mossambica*: amide proton resonances.
90. Richarz, R. and Wüthrich, K. (1977) *FEBS Lett.* **79**, 64–68.
High field ^{13}C NMR studies at 90.5 MHz of the methyl groups in the basic pancreatic trypsin inhibitor.
91. Brown, L.R. and Wüthrich, K. (1977) *Biochim. Biophys. Acta* **468**, 389–410.
NMR and ESR studies of the interactions of cytochrome c with mixed cardiolipin phosphatidylcholine vesicles.
92. Wüthrich, K. (1977) in *Nuclear Magnetic Resonance in Solids* (L. van Gerven, ed.) pp. 347–360, Plenum Press, New York.
NMR studies of structure and conformation in peptides and proteins.
93. Wüthrich, K. (1977) in *Nuclear Magnetic Resonance in Solids* (L. van Gerven, ed.) pp. 361–374, Plenum Press, New York.
NMR studies of hemoproteins.
94. Wüthrich, K., Wagner, G., Richarz, R. and DeMarco, A. (1977) in *NMR in Biology*, (R.A. Dwek, I.D. Campbell, R.E. Richards and R.J.P. Williams, eds.) pp. 51–62, Academic Press, New York.
Completion of X-ray structures of proteins by high resolution NMR.

95. DeMarco, A., Tschesche, H., Wagner, G. and Wüthrich, K. (1977) *Biophys. Struct. Mech.* **3**, 303–315.
¹H NMR studies at 360 MHz of the methyl groups in native and chemically modified basic pancreatic trypsin inhibitor (BPTI).
96. Nagayama, K., Wüthrich, K., Bachmann, P. and Ernst, R.R. (1977) *Biochem. Biophys. Res. Comm.* **78**, 99–105.
Two-dimensional J-resolved ¹H NMR spectroscopy of biological macromolecules.
97. Nagayama, K., Wüthrich, K., Bachmann, P. and Ernst, R.R. (1977) *Naturwissenschaften* **64**, 581–582.
Two-dimensional NMR spectroscopy: a powerful tool for the investigation of biopolymers in solution.
98. Llinás, M. and Wüthrich, K. (1978) *Biochim. Biophys. Acta* **532**, 29–40.
A nitrogen-15 spin-lattice relaxation study of alumichrome.
99. Keller, R.M. and Wüthrich, K. (1978) *Biochim. Biophys. Acta* **533**, 195–208.
Assignment of the heme c resonances in the 360 MHz ¹H NMR spectra of cytochrome c.
100. DeMarco, A., Llinás, M. and Wüthrich, K. (1978) *Biopolymers* **17**, 617–636.
Analysis of the ¹H NMR spectra of ferrichrome peptides I: the non-amide protons.
101. DeMarco, A., Llinás, M. and Wüthrich, K. (1978) *Biopolymers* **17**, 637–650.
Analysis of the ¹H NMR spectra of ferrichrome peptides II: the amide resonances.
102. Wagner, G., Wüthrich, K. and Tschesche, H. (1978) *Eur. J. Biochem.* **86**, 67–76.
A ¹H nuclear magnetic resonance study of the conformation and the molecular dynamics of the glycoprotein cow colostrum trypsin inhibitor.
103. Richarz, R. and Wüthrich, K. (1978) *J. Magn. Reson.* **30**, 147–150.
NOE difference spectroscopy: a novel method for observing individual multiplets in proton nmr spectra of biological macromolecules.
104. Brown, L.R., DeMarco, A., Richarz, R., Wagner, G. and Wüthrich, K. (1978) *Eur. J. Biochem.* **88**, 87–95.
The influence of a single salt bridge on static and dynamic features of the globular solution conformation of the basic pancreatic trypsin inhibitor: ¹H and ¹³C nuclear magnetic resonance studies of the native and the transaminated inhibitor.
105. Wüthrich, K., Wagner, G., Richarz, R. and Perkins, S.J. (1978) *Biochemistry* **17**, 2253–2263.
Individual assignments of the methyl resonances in the ¹H nuclear magnetic resonance spectrum of the basic pancreatic trypsin inhibitor.
106. Richarz, R. and Wüthrich, K. (1978) *Biochemistry* **17**, 2263–2269.
High field ¹³C nuclear magnetic resonance studies at 90.5 MHz of the basic pancreatic trypsin inhibitor.
107. Nagayama, K., Bachmann, P., Wüthrich, K. and Ernst, R.R. (1978) *J. Magn. Reson.* **31**, 133–148.
The use of cross sections and of projections in two-dimensional NMR spectroscopy.
108. Keller, R.M. and Wüthrich, K. (1978) *Biochem. Biophys. Res. Comm.* **83**, 1132–1139.

Evolutionary change of the heme c electronic structure: ferricytochrome c-551 from *Pseudomonas aeruginosa* and horse heart ferricytochrome c.

109. Wagner, G., Wüthrich, K. and Tschesche, H. (1978) *Eur. J. Biochem.* **89**, 367–377.
A ^1H nuclear magnetic resonance study of the solution conformation of the iso-inhibitor K from *Helix pomatia*.
110. Wagner, G. and Wüthrich, K. (1978) *Nature* **275**, 247–248.
Dynamic model of globular protein conformations based on NMR studies in solution.
111. Lauterwein, J. and Wüthrich, K. (1978) *FEBS Lett.* **93**, 181–184.
A possible structural basis for the different modes of action of neurotoxins and cardiotoxins from snake venoms.
112. Wüthrich, K. and Wagner, G. (1978) *Trends Biochem. Sci.* **3**, 227–230.
Internal motion in globular proteins.
113. Richarz, R. and Wüthrich, K. (1978) *Biopolymers* **17**, 2133–2141.
Carbon-13 NMR chemical shifts of the common amino acid residues measured in aqueous solutions of the linear tetrapeptides H–Gly–Gly–X–L-Ala–OH.
114. Wüthrich, K., Wagner, G. and Bundi, A. (1978) in *Nuclear Magnetic Resonance Spectroscopy in Molecular Biology* (B. Pullman, ed.) pp. 201–210, Reidel, Dordrecht.
NMR studies of the molecular dynamics of peptides and proteins.
115. Bundi, A., Andreatta, R.H. and Wüthrich, K. (1978) *Eur. J. Biochem.* **91**, 201–208.
Characterisation of a local structure in the synthetic parathyroid hormone fragment 1–34 by ^1H nuclear magnetic resonance techniques.
116. Bösch, C., Bundi, A., Oppliger, M. and Wüthrich, K. (1978) *Eur. J. Biochem.* **91**, 209–214.
 ^1H nuclear magnetic resonance studies of the molecular conformation of monomeric glucagon in aqueous solution.
117. Perkins, S.J. and Wüthrich, K. (1978) *Biochim. Biophys. Acta* **536**, 406–420.
Structural interpretation of lanthanide binding to the basic pancreatic trypsin inhibitor by ^1H NMR at 360 MHz.
118. Gordon, S.L. and Wüthrich, K. (1978) *J. Am. Chem. Soc.* **100**, 7094–7096.
Transient proton–proton Overhauser effects in horse ferrocyanochrome c.
119. DeMarco, A., Llinás, M. and Wüthrich, K. (1978) *Biopolymers* **17**, 2727–2742.
 ^1H – ^{15}N spin–spin couplings in alumichrome.
120. Lauterwein, J., Lazdunski, M. and Wüthrich, K. (1978) *Eur. J. Biochem.* **92**, 361–71.
The ^1H nuclear magnetic resonance spectra of neurotoxin I and cardiotoxin V^{II}4 from *Naja mossambica mossambica*.
121. Llinás, M., Klein, M.P. and Wüthrich, K. (1978) *Biophys. J.* **24**, 849–862.
Amide proton spin–lattice relaxation in polypeptides: a field-dependence study of the proton and nitrogen dipolar interactions in alumichrome.

122. Viti, V., Wüthrich, K., Giacometti, G. and Brunori, M. (1978) in *Proceedings of the European Conference on NMR of Macromolecules* (F. Conti, ed.) pp. 509–516, Lerici, Sassari, Italy.
¹H NMR studies of structural aspects of the root effect in trout hemoglobin.
123. Nagayama, K., Bachmann, P., Ernst, R.R. and Wüthrich, K. (1979) *Biochem. Biophys. Res. Comm.* **86**, 218–225.
 Selective spin decoupling in the J-resolved two-dimensional ¹H NMR spectra of proteins.
124. Perkins, S.J. and Wüthrich, K. (1979) *Biochim. Biophys. Acta* **576**, 409–423.
 Ring current effects in the conformation-dependent NMR chemical shifts of aliphatic protons in the basic pancreatic trypsin inhibitor.
125. Bundi, A. and Wüthrich, K. (1979) *Biopolymers* **18**, 285–297.
¹H NMR parameters of the common amino acid residues measured in aqueous solutions of the linear tetrapeptides H–Gly–Gly–X–L-Ala–OH.
126. Bundi, A. and Wüthrich, K. (1979) *Biopolymers* **18**, 299–311.
 Use of amide ¹H NMR titration shifts for studies of polypeptide conformation.
127. Wüthrich, K., Wagner, G. and Richarz, R. (1979) in *Protein: Structure, Function and Industrial Applications* (E. Hofmann, W. Pfeil and H. Aurich, eds.) pp. 143–152, Pergamon, New York.
 A dynamic model for globular protein conformations based on high resolution NMR data.
128. Wüthrich, K., Keller, R.M. and Gordon, S.L. (1978) in *Frontiers of Biological Energetics*, (P.L. Dutton, J. Leigh and A. Scarpa, eds.) Vol. I, pp. 109–117, Academic Press, New York.
 Evolutionary changes of the heme c electronic structure in cytochromes c.
129. Dubs, A., Wagner, G. and Wüthrich, K. (1979) *Biochim. Biophys. Acta* **577**, 177–194.
 Individual assignments of amide proton resonances in the proton NMR spectrum of the basic pancreatic trypsin inhibitor.
130. Wagner, G., Tschesche, H. and Wüthrich, K. (1979) *Eur. J. Biochem.* **95**, 239–248.
 The influence of localized chemical modifications of the basic pancreatic trypsin inhibitor on static and dynamic aspects of the molecular conformation in solution.
131. Wagner, G., Kalb (Gilboa), A.J. and Wüthrich, K. (1979) *Eur. J. Biochem.* **95**, 249–253.
 Conformational studies by ¹H nuclear magnetic resonance of the basic pancreatic trypsin inhibitor after reduction of the disulfide bond between Cys-14 and Cys-38.
132. Wagner, G. and Wüthrich, K. (1979) *J. Magn. Reson.* **33**, 675–680.
 Truncated driven nuclear Overhauser effect (TOE): a new technique for studies of selective ¹H–¹H Overhauser effects in the presence of spin diffusion.
133. Wüthrich, K. and Wagner, G. (1979) *J. Mol. Biol.* **130**, 1–18.
 Nuclear magnetic resonance of labile protons in the basic pancreatic trypsin inhibitor.
134. Richarz, R., Sehr, P., Wagner, G. and Wüthrich, K. (1979) *J. Mol. Biol.* **130**, 19–30.
 Kinetics of the exchange of individual amide protons in the basic pancreatic trypsin inhibitor.
135. Wagner, G. and Wüthrich, K. (1979) *J. Mol. Biol.* **130**, 31–37.
 Correlation between the amide proton exchange rates and the denaturation temperatures in globular proteins related to the basic pancreatic trypsin inhibitor.

136. Wüthrich, K., Nagayama, K. and Ernst, R.R. (1979) *Trends Biochem. Sci.* **4**, N178–N181.
Two-dimensional NMR spectroscopy.
137. Nagayama, K., Wüthrich, K. and Ernst, R.R. (1979) *Biochem. Biophys. Res. Comm.* **90**, 305–311.
Two-dimensional spin echo correlated spectroscopy (SECSY) for ^1H NMR studies of biological macromolecules.
138. Lauterwein, J., Bösch, C., Brown, L.R. and Wüthrich, K. (1979) *Biochim. Biophys. Acta* **556**, 244–264.
Physicochemical studies of the protein–lipid interactions in melittin-containing micelles.
139. Keller, R.M., Picot, D. and Wüthrich, K. (1979) *Biochim. Biophys. Acta* **580**, 259–265.
Individual assignments of the heme resonances in the 360 MHz ^1H NMR spectra of cytochrome c-557 from *Critchidia oncopelti*.
140. Hetzel, R. and Wüthrich, K. (1979) *Biopolymers* **18**, 2589–2606.
Conformational energy studies of linear dipeptides H-X-L-Pro-OH.
141. Wagner, G. and Wüthrich, K. (1979) *J. Mol. Biol.* **134**, 75–94.
Structural interpretation of the amide proton exchange in the basic pancreatic trypsin inhibitor and related proteins.
142. Ernst, R.R., Aue, W.P., Bachmann, P., Höhener, A., Linder, M., Meier, B., Müller, L., Wokaun, A., Nagayama, K., Wüthrich, K. and Jeener, J. (1978) *Proc. XXth Congress AMPERE*, Tallinn, 15–18.
Applications of two-dimensional spectroscopy to problems of physical, chemical and biological relevance.
143. Vašák, M., Nagayama, K., Wüthrich, K., Mertens, M.L. and Kägi, J.H.R. (1979) *Biochemistry* **18**, 5050–5055.
Creatine kinase: nuclear magnetic resonance and fluorescence evidence for interactions of adenosine 5'-diphosphate with aromatic residues.
144. Richarz, R., Tschesche, H. and Wüthrich, K. (1979) *Eur. J. Biochem.* **102**, 563–571.
Structural characterization by nuclear magnetic resonance of a reactive-site carbon-13-labelled basic pancreatic trypsin inhibitor with the peptide bond Arg-39 – Ala-40 cleaved and Arg-39 removed.
145. Wüthrich, K. (1979) Japanese Edition of 'NMR in Biological Research: Peptides and Proteins' (Translation by Y. Arata and M. Kainosh). Kagaku Dozin, Tokyo, Japan.
146. Keller, R.M. and Wüthrich, K. (1980) *Biochim. Biophys. Acta* **621**, 204–217.
Structural study of the heme crevice in cytochrome b₅ based on individual assignments of the ^1H NMR lines of the heme group and selected amino acid residues.
147. Wüthrich, K., Roder, H. and Wagner, G. (1980) in *Protein Folding* (R. Jaenicke, ed.) pp. 549–564, North-Holland, Amsterdam.
Internal mobility and unfolding of globular proteins.
148. Senn, H., Keller, R.M. and Wüthrich, K. (1980) *Biochem. Biophys. Res. Comm.* **92**, 1362–1369.
Different chirality of the axial methionine in homologous cytochromes c determined by ^1H NMR and CD spectroscopy.

149. Wüthrich, K. (1980) in *Frontiers of Bioorganic Chemistry and Molecular Biology* (S.N. Ananchenko, ed.) pp. 161–168, Pergamon Press, Oxford.
Complementation of protein crystal structures by NMR studies in solution.
150. Lauterwein, J., Brown, L.R. and Wüthrich, K. (1980) *Biochim. Biophys. Acta* **622**, 219–230.
High-resolution ^1H NMR studies of monomeric melittin in aqueous solution.
151. Brown, L.R., Lauterwein, J. and Wüthrich, K. (1980) *Biochim. Biophys. Acta* **622**, 231–244.
High-resolution ^1H NMR studies of self-aggregation of melittin in aqueous solution.
152. Perkins, S.J. and Wüthrich, K. (1980) *J. Mol. Biol.* **138**, 43–64.
Conformational transition from trypsinogen to trypsin: ^1H nuclear magnetic resonance at 360 MHz and ring current calculations.
153. Anil-Kumar, Ernst, R.R. and Wüthrich, K. (1980) *Biochem. Biophys. Res. Comm.* **95**, 1–6.
A two-dimensional nuclear Overhauser enhancement (2D NOE) experiment for the elucidation of complete proton–proton cross-relaxation networks in biological macromolecules.
154. Wüthrich, K., Bösch, C. and Brown, L.R. (1980) *Biochem. Biophys. Res. Comm.* **95**, 1504–1509.
Conformational studies of lipid-bound polypeptides by elucidation of proton–proton cross-relaxation networks.
155. Nagayama, K., Anil-Kumar, Wüthrich, K. and Ernst, R.R. (1980) *J. Magn. Reson.* **40**, 321–334.
Experimental techniques of two-dimensional correlated spectroscopy.
156. Anil-Kumar, Wagner, G., Ernst, R.R. and Wüthrich, K. (1980) *Biochem. Biophys. Res. Comm.* **96**, 1156–1163.
Studies of J-connectivities and selective ^1H – ^1H Overhauser effects in H_2O solutions of biological macromolecules by two-dimensional NMR experiments.
157. Wüthrich, K., Wagner, G., Richarz, R. and Braun, W. (1980) *Biophys. J.* **32**, 549–560.
Correlations between internal mobility and stability of globular proteins.
158. Keller, R.M., Scheiter, A. and Wüthrich, K. (1980) *Biochim. Biophys. Acta* **626**, 15–22.
 ^1H NMR studies of the coordination geometry at the heme iron and the electronic structure of the heme group in cytochrome c-552 from *Euglena gracilis*.
159. Grathwohl, C. and Wüthrich, K. (1981) in *Perspectives in Peptide Chemistry* (A. Eberle, R. Geiger and T. Wieland, eds.) pp. 249–260, Karger, Basel.
Nuclear magnetic resonance studies of peptide and protein conformations.
160. Richarz, R., Nagayama, K. and Wüthrich, K. (1980) *Biochemistry* **19**, 5189–5196.
Carbon-13 nuclear magnetic resonance relaxation studies of internal mobility of the polypeptide chain in basic pancreatic trypsin inhibitor and a selectively reduced analogue.
161. Richarz, R., Tschesche, H. and Wüthrich, K. (1980) *Biochemistry* **19**, 5711–5715.
Carbon-13 nuclear magnetic resonance studies of the selectively isotope-labeled reactive site peptide bond of the basic pancreatic trypsin inhibitor in the complexes with trypsin, trypsinogen and anhydrotrypsin.

162. Wüthrich, K., Eugster, A. and Wagner, G. (1980) *J. Mol. Biol.* **144**, 601–604.
 p^2H dependence of the exchange with the solvent of interior amide protons in basic pancreatic trypsin inhibitor modified by reduction of the disulfide bond 14–38.
163. Bösch, C., Brown, L.R. and Wüthrich, K. (1980) *Biochim. Biophys. Acta* **603**, 298–312.
 Physicochemical characterization of glucagon-containing lipid micelles.
164. Wüthrich, K. and Wagner, G. (1980) in *Biomolecular Structure, Conformation, Function and Evolution, Vol. 2: Physico-Chemical and Theoretical Studies* (R. Srinivasan, ed.) pp. 23-29, Pergamon Press, Oxford.
 Dynamic aspects of protein conformation studied by nuclear magnetic resonance techniques: evidence for hydrophobic stability domains in globular proteins.
165. Nagayama, K. and Wüthrich, K. (1981) *Eur. J. Biochem.* **114**, 365–374.
 Systematic application of two-dimensional 1H nuclear magnetic resonance techniques for studies of proteins 1: combined use of spin-echo-correlated spectroscopy and J-resolved spectroscopy for the identification of complete spin systems of non-labile protons in amino acid residues.
166. Wagner, G., Anil-Kumar and Wüthrich, K. (1981) *Eur. J. Biochem.* **114**, 375–384.
 Systematic application of two-dimensional 1H nuclear magnetic resonance techniques for studies of proteins 2: combined use of correlated spectroscopy and nuclear Overhauser spectroscopy for sequential assignments of backbone resonances and elucidation of polypeptide secondary structures.
167. Braun, W., Bösch, C., Brown, L.R., Gö, N. and Wüthrich, K. (1981) *Biochim. Biophys. Acta* **667**, 377–396.
 Combined use of proton–proton Overhauser enhancements and a distance geometry algorithm for determination of polypeptide conformations: application to micelle-bound glucagon.
168. Bösch, C., Anil-Kumar, Baumann, R., Ernst, R.R. and Wüthrich, K. (1981) *J. Magn. Reson.* **42**, 159–163.
 Comparison of selective proton–proton Overhauser effects in biological macromolecules observed by one-dimensional and two-dimensional NMR experiments.
169. Wider, G., Baumann, R., Nagayama, K., Ernst, R.R. and Wüthrich, K. (1981) *J. Magn. Reson.* **42**, 73–87.
 Strong spin–spin coupling in the two-dimensional J-resolved 360 MHz 1H NMR spectra of the common amino acids.
170. Brown, L.R., Bösch, C. and Wüthrich, K. (1981) *Biochim. Biophys. Acta* **642**, 296–312.
 Location and orientation relative to the micelle surface for glucagon in mixed micelles with dodecylphosphocholine: EPR and NMR studies.
171. Nagayama, K. and Wüthrich, K. (1981) *Eur. J. Biochem.* **115**, 653–657 .
 Structural interpretation of vicinal proton–proton coupling constants $^3J_{\alpha\beta}$ in the basic pancreatic trypsin inhibitor measured by two-dimensional J-resolved NMR spectroscopy.
172. Keller, R.M. and Wüthrich, K. (1981) *Biochim. Biophys. Acta* **668**, 307–320.
 1H NMR studies of structural homologies between the heme environments in horse cytochrome c and in cytochrome c-552 from *Euglena gracilis*.

173. Wüthrich, K. (1981) in *Lectures Delivered at the International Winter School on Current Trends in Biomolecular Structures* (R. Srinivasan, ed.) pp. 271–293, Macmillan India, Madras.
High resolution nuclear magnetic resonance (NMR) studies of peptides and proteins.
174. Anil-Kumar, Wagner, G., Ernst, R.R. and Wüthrich, K. (1981) *J. Am. Chem. Soc.* **103**, 3654–3658.
Buildup rates of the nuclear Overhauser effect measured by two-dimensional proton magnetic resonance spectroscopy: implications for studies of protein conformation.
175. Possani, L., Steinmetz, W.E., Dent, M.A.R., Alagón, A.C. and Wüthrich, K. (1981) *Biochim. Biophys. Acta* **669**, 183–192.
Preliminary spectroscopic characterization of six toxins from latin american scorpions.
176. Baumann, R., Anil-Kumar, Ernst, R.R. and Wüthrich, K. (1981) *J. Magn. Reson.* **44**, 76–83.
Improvement of 2D NOE and 2D correlated spectra by triangular multiplication.
177. Keller, R.M. and Wüthrich, K. (1981) in *Biological Magnetic Resonance* (L.J. Berliner and J. Reuben, eds.) Vol. 3, 1–52, Plenum Press, New York.
Multiple irradiation ^1H NMR experiments with hemoproteins.
178. Nagayama, K. and Wüthrich, K. (1980) in *Protein Dynamics and Energy Transduction*, pp. 83–12, Taniguchi Foundation, Osaka.
An application of two-dimensional NMR techniques for studies of the rotational mobility of the amino acid side chains about the $\text{C}^\alpha\text{--C}^\beta$ bonds in basic pancreatic trypsin inhibitor.
179. Wüthrich, K., Richarz, R., Perkins, S.J. and Tschesche, H. (1981) in *Structural Aspects of Recognition and Assembly in Biological Macromolecules* (M. Balaban, J.L. Sussman, W. Traub and A. Yonath, eds.) pp. 21–34, Balaban ISS, Rehovot.
Protein–protein interactions in the complexes formed between the basic pancreatic trypsin inhibitor (BPTI) and trypsin or trypsinogen: studies in solution by ^{13}C NMR and ^1H NMR.
180. Baumann, R., Wider, G., Ernst, R.R. and Wüthrich, K. (1981) *J. Magn. Reson.* **44**, 402–406.
Improvement of 2D NOE and 2D correlated spectra by symmetrization.
181. Brown, L.R. and Wüthrich, K. (1981) *Biochim. Biophys. Acta* **647**, 95–111.
Melittin bound to dodecylphosphocholine micelles: ^1H NMR assignments and global conformational features.
182. Wüthrich, K. (1981) *Biochem. Soc. Symp.* **46**, 17–37.
Nuclear magnetic resonance studies of internal mobility in globular proteins.
183. Grathwohl, C. and Wüthrich, K. (1981) *Biopolymers* **20**, 2623–2633.
NMR studies of the rates of proline *cis-trans* isomerization in oligopeptides.
184. Steinmetz, W.E., Moonen, X., Anil-Kumar, Lazdunski, M., Visser, L., Carlsson, F.H.H. and Wüthrich, K. (1981) *Eur. J. Biochem.* **120**, 467–475.
 ^1H nuclear magnetic resonance studies of the conformation of cardiotoxin $\text{V}^{\text{II}}2$ from *Naja mossambica mossambica*.
185. Brown, L.R., Braun, W., Anil-Kumar and Wüthrich, K. (1982) *Biophys. J.* **37**, 319–328.
High resolution nuclear magnetic resonance studies of the conformation and orientation of melittin bound to a lipid–water interface.

186. Macura, S., Wüthrich, K. and Ernst, R.R. (1982) *J. Magn. Reson.* **46**, 269–282.
Separation and suppression of coherent transfer effects in two-dimensional NOE and chemical exchange spectroscopy.
187. Wüthrich, K., Wider, G., Wagner, G. and Braun, W. (1982) *J. Mol. Biol.* **155**, 311–319.
Sequential resonance assignments as a basis for determination of spatial protein structures by high resolution proton nuclear magnetic resonance.
188. Billeter, M., Braun, W. and Wüthrich, K. (1982) *J. Mol. Biol.* **155**, 321–346.
Sequential resonance assignments in protein ^1H nuclear magnetic resonance spectra: computation of sterically allowed proton–proton distances and statistical analysis of proton–proton distances in single crystal protein conformations.
189. Wagner, G. and Wüthrich, K. (1982) *J. Mol. Biol.* **155**, 347–366.
Sequential resonance assignments in protein ^1H nuclear magnetic resonance spectra: basic pancreatic trypsin inhibitor.
190. Wider, G., Lee, K.H. and Wüthrich, K. (1982) *J. Mol. Biol.* **155**, 367–388.
Sequential resonance assignments in protein ^1H nuclear magnetic resonance spectra: glucagon bound to perdeuterated dodecylphosphocholine micelles.
191. Macura, S., Wüthrich, K. and Ernst, R.R. (1982) *J. Magn. Reson.* **47**, 351–357.
The relevance of J cross-peaks in two-dimensional NOE experiments of macromolecules.
192. Wüthrich, K. (1982) in *Structural Molecular Biology* (D.B. Davies, W. Saenger and S.S. Danyluk, eds.) pp. 215–235 Plenum Press, New York.
High resolution NMR experiments for studies of protein conformations.
193. Arseniev, A.S., Wider, G., Joubert, F.J. and Wüthrich, K. (1982) *J. Mol. Biol.* **159**, 323–351.
Assignment of the ^1H nuclear magnetic resonance spectrum of the trypsin inhibitor E from *Dendroaspis polylepis polylepis*: two-dimensional nuclear magnetic resonance at 500 MHz.
194. Wagner, G. and Wüthrich, K. (1982) *J. Mol. Biol.* **160**, 343–361.
Amide proton exchange and surface conformation of the basic pancreatic trypsin inhibitor in solution: studies with two-dimensional nuclear magnetic resonance.
195. Wüthrich, K. (1982) *Die Umschau* **82**, 684–690.
Die Struktur von nicht-kristallinen Proteinen.
196. Keller, R.M., Baumann, R., Hunziker-Kwik, E.H., Joubert, F.J. and Wüthrich, K. (1983) *J. Mol. Biol.* **163**, 623–646.
Assignment of the ^1H nuclear magnetic resonance spectrum of the trypsin inhibitor homologue K from *Dendroaspis polylepis polylepis*: two-dimensional nuclear magnetic resonance at 360 and 500 MHz.
197. Wüthrich, K., Bösch, C., Braun, W., Brown, L.R., Lee, K.H. and Wider, G. (1982) in *Structure of Complexes between Biopolymers and Low Molecular Weight Molecules*, (W. Bartmann and G. Snatzke, eds.) pp. 45–155, Wiley, New York.
NMR studies of the conformation of polypeptide chains bound to lipid micelles.
198. Wüthrich, K. and Wagner, G. (1983) in *Mobility and Function in Proteins and Nucleic Acids* (R. Porter, M. O'Connor and J. Whelan, eds.) pp. 310–328, Pitman, London.

Nuclear magnetic resonance studies of mobility in proteins.

199. Hosur, R.V., Wider, G. and Wüthrich, K. (1983) *Eur. J. Biochem.* **130**, 497–508 .
Sequential individual resonance assignments in the ^1H nuclear magnetic resonance spectrum of cardiotoxin V $^{II}2$ from *Naja mossambica mossambica*.
200. Senn, H., Eugster, A. and Wüthrich, K. (1983) *Biochim. Biophys. Acta* **743**, 58–68.
Determination of the coordination geometry at the heme iron in three cytochromes c from *Saccharomyces cerevisiae* and from *Candida krusei* based on individual ^1H NMR assignments for heme c and the axially coordinated amino acids.
201. Senn, H. and Wüthrich, K. (1983) *Biochim. Biophys. Acta* **743**, 69–81.
Individual ^1H NMR assignments for the heme groups and the axially bound amino acids and determination of the coordination geometry at the heme iron in a mixture of two isocytochromes c-551 from *Rhodopseudomonas gelatinosa*.
202. Wagner, G. und Wüthrich, K. (1983) *Naturwissenschaften* **70**, 105–114.
Dynamik von Protein-Strukturen.
203. Wüthrich, K. (1983) *Biopolymers* **22**, 131–138.
Sequential individual resonance assignments in the ^1H -NMR spectra of polypeptides and proteins.
204. Wider, G., Hosur, R.V. and Wüthrich, K. (1983) *J. Magn. Reson.* **52**, 13–135.
Suppression of the solvent resonance in 2D NMR spectra of proteins in H_2O solution.
205. Wüthrich, K. (1983) in *Fortschriffsberichte aus Naturwissenschaft und Medizin* (H.A. Staab, W. Gerok, H. Markl, W. Martienssen und H. Gibian, eds.) pp. 169–182, Wissenschaftliche Verlagsgesellschaft, Stuttgart.
Räumliche Struktur von Proteinen in Lösung und in Lipid-Wasser-Grenzschichten.
206. Pardi, A., Walker, R., Rapoport, H., Wider, G. and Wüthrich, K. (1983) *J. Am. Chem. Soc.* **105**, 1652–1653.
Sequential assignments for the ^1H and ^{31}P atoms in the backbone of oligonucleotides by two-dimensional nuclear magnetic resonance.
207. Strop , P. and Wüthrich, K. (1983) *J. Mol. Biol.* **166**, 631–640.
Characterization of the proteinase inhibitor IIA from bull seminal plasma by ^1H nuclear magnetic resonance: stability, amide proton exchange and mobility of aromatic residues.
208. Strop , P., Wider, G. and Wüthrich, K. (1983) *J. Mol. Biol.* **166**, 641–667.
Assignment of the ^1H nuclear magnetic resonance spectrum of the proteinase inhibitor IIA from bull seminal plasma by two-dimensional nuclear magnetic resonance at 500 MHz.
209. Strop , P., vCechová , D. and Wüthrich, K. (1983) *J. Mol. Biol.* **166**, 669–676.
Preliminary structural comparison of the proteinase isoinhibitors IIA and IIB from bull seminal plasma based on individual assignments of the ^1H nuclear magnetic resonance spectra by two-dimensional nuclear magnetic resonance at 500 MHz.
210. Marion, D. and Wüthrich, K. (1983) *Biochem. Biophys. Res. Comm.* **113**, 967–974.

Application of phase sensitive two-dimensional correlated spectroscopy (COSY) for measurements of ^1H - ^1H spin–spin coupling constants in proteins.

211. Senn, H. and Wüthrich, K. (1983) *Biochim. Biophys. Acta* **746**, 48–60.
Conformation of the axially bound ligands of the heme iron and electronic structure of heme c in the cytochromes c-551 from *Pseudomonas mendocina* and *Pseudomonas stutzeri* and in cytochrome c from *Rhodospirillum rubrum*.
212. Senn, H. and Wüthrich, K. (1983) *Biochim. Biophys. Acta* **747**, 16–25.
A new spatial structure for the axial methionine observed in cytochrome c₅ from *Pseudomonas mendocina*: correlations with the electronic structure of heme c.
213. Hosur, R.V., Ernst, R.R. and Wüthrich, K. (1983) *J. Magn. Reson.* **54**, 142–145.
A simple two-dimensional measurement of the decoupler power during continuous homonuclear irradiation for the correction of Bloch-Siegert shifts.
214. Wagner, G., Pardi, A. and Wüthrich, K. (1983) *J. Am. Chem. Soc.* **105**, 5948–5949.
Hydrogen bond length and ^1H NMR chemical shifts in proteins.
215. Braun, W., Wider, G., Lee, K.H. and Wüthrich, K. (1983) *J. Mol. Biol.* **169**, 921–948.
Conformation of glucagon in a lipid–water interphase by ^1H nuclear magnetic resonance.
216. Wüthrich, K., Billeter, M. and Braun, W. (1983) *J. Mol. Biol.* **169**, 949–961.
Pseudo-structures for the 20 common amino acids for use in studies of protein conformations by measurements of intramolecular proton–proton distance constraints with nuclear magnetic resonance.
217. Zuiderweg, E.R.P., Kaptein, R. and Wüthrich, K. (1983) *Proc. Natl. Acad. Sci. USA* **80**, 5837–5841.
Secondary structure of the lac repressor DNA-binding domain by two-dimensional ^1H nuclear magnetic resonance in solution.
218. Senn, H., Guerlesquin, F., Bruschi, M. and Wüthrich, K. (1983) *Biochim. Biophys. Acta* **748**, 194–204.
Coordination of the heme iron in the low-potential cytochrome c-553 from *Desulfovibrio vulgaris* and *Desulfovibrio desulfuricans*. Different chirality of the axially bound methionine in the oxidized and reduced states.
219. Zuiderweg, E.R.P., Kaptein, R. and Wüthrich, K. (1983) *Eur. J. Biochem.* **137**, 279–292.
Sequence-specific resonance assignments in the ^1H nuclear magnetic resonance spectrum of the lac repressor DNA-Binding domain 1–51 from *Escherichia coli* by two-dimensional spectroscopy.
220. Pardi, A., Wagner, G. and Wüthrich, K. (1983) *Eur. J. Biochem.* **137**, 445–454.
Protein conformation and proton nuclear magnetic resonance chemical shifts.
221. Rance, M., Sørensen, O.W., Bodenhausen, G., Wagner, G., Ernst, R.R. and Wüthrich, K. (1983) *Biochem. Biophys. Res. Comm.* **117**, 479–485.
Improved spectral resolution in COSY ^1H NMR spectra of proteins via double quantum filtering.
222. Wider, G., Macura, S., Anil Kumar, Ernst, R.R. and Wüthrich, K. (1984) *J. Magn. Reson.* **56**, 207–234.
Homonuclear two-dimensional ^1H NMR of proteins: experimental procedures.

223. Senn, H., Cusanovich, M.A. and Wüthrich, K. (1984) *Biochim. Biophys. Acta* **785**, 46–53.
¹H NMR assignments for the heme group and electronic structure in *Chlorobium thiosulfatophilum* cytochrome c-555.
224. Williamson, M.P., Marion, D. and Wüthrich, K. (1984) *J. Mol. Biol.* **173**, 341–359.
Secondary structure in the solution conformation of the proteinase inhibitor IIA from bull seminal plasma by nuclear magnetic resonance.
225. Neuhaus, D., Wider, G., Wagner, G. and Wüthrich, K. (1984) *J. Magn. Reson.* **57**, 164–168.
X-relayed ¹H–¹H correlated spectroscopy.
226. Wüthrich, K. and Wagner, G. (1984) *Trends Biochem. Sci.* **9**, 152–154.
Internal dynamics of proteins.
227. Senn, H., Billeter, M. and Wüthrich, K. (1984) *Eur. Biophys. J.* **11**, 3–15.
The spatial structure of the axially bound methionine in solution conformations of horse ferrocyanochrome c and *Pseudomonas aeruginosa* ferrocyanochrome c 551 by ¹H NMR.
228. Wüthrich, K., vStrop,, P., Ebina, S. and Williamson, M.P. (1984) *Biochem. Biophys. Res. Comm.* **122**, 1174–1178.
A globular protein with slower amide proton exchange from an α helix than from antiparallel β sheets.
229. Rance, M., Wagner, G., Sørensen, O.W., Wüthrich, K. and Ernst, R.R. (1984) *J. Magn. Reson.* **59**, 250–261.
Applications of ω_1 -decoupled 2D correlation spectra to the study of proteins.
230. Senn, H., Böhme, H. and Wüthrich, K. (1984) *Biochim. Biophys. Acta* **789**, 311–323.
Studies of the solution conformation of *Spirulina platensis* cytochrome c-553 by ¹H nuclear magnetic resonance and circular dichroism.
231. Neuhaus, D., Wagner, G., Vašák, M., Kägi, J.H.R. and Wüthrich, K. (1984) *Eur. J. Biochem.* **143**, 659–667.
¹¹³Cd–¹H spin–spin couplings in homonuclear ¹H correlated spectroscopy of metallothionein: identification of the cysteine ¹H spin systems.
232. Zuiderweg, E.R.P., Billeter, M., Boelens, R., Scheek, R.M., Wüthrich, K. and Kaptein, R. (1984) *FEBS Lett.* **174**, 243–247.
Spatial arrangement of the three α helices in the solution conformation of *E. coli lac* repressor DNA-binding domain.
233. Havel, T.F. and Wüthrich, K. (1984) *Bull. Math. Biol.* **46**, 673–698.
A distance geometry program for determining the structures of small proteins and other macromolecules from nuclear magnetic resonance measurements of intramolecular ¹H–¹H proximities in solution.
234. Stassinopoulou, C.I., Wagner, G. and Wüthrich, K. (1984) *Eur. J. Biochem.* **145**, 423–430.
Two-dimensional ¹H NMR of two chemically modified analogs of the basic pancreatic trypsin inhibitor: sequence specific resonance assignments and sequence location of conformation changes relative to the native protein.

235. Wagner, G., Stassinopoulou, C.I. and Wüthrich, K. (1984) *Eur. J. Biochem.* **145**, 431–436.
Amide proton exchange studies by two-dimensional correlated ^1H NMR in two chemically modified analogs of the basic pancreatic trypsin inhibitor.
236. Ebina, E. and Wüthrich, K. (1984) *J. Mol. Biol.* **179**, 283–288.
Amide proton titration shifts in bull seminal inhibitor IIA by two-dimensional correlated ^1H nuclear magnetic resonance (COSY): manifestation of conformational equilibria involving carboxylate groups.
237. Bodenhausen, G., Wagner, G., Rance, M., Sørensen, O.W., Wüthrich , K. and Ernst, R.R. (1984) *J. Magn. Reson.* **59**, 542–550.
Longitudinal two-spin order in 2D exchange spectroscopy (NOESY).
238. Zuiderweg, E.R.P., Billeter, M. Kaptein, R., Boelens, R., Scheek , R.M. and Wüthrich, K. (1984) in *Progress in Bioorganic Chemistry and Molecular Biology* (Yu.A. Ovchinnikov, ed.) pp. 65–70, Elsevier, Amsterdam.
Solution conformation of *E. coli lac* repressor DNA-binding domain by 2D NMR: sequence location and spatial arrangement of three α -helices.
239. Wüthrich, K. (1981) *Makromol. Chem. Suppl.* **5**, 234–252.
Studies of static and dynamic aspects of spatial protein structures by high resolution nuclear magnetic resonance spectroscopy.
240. Wüthrich, K., Billeter, M. and Braun, W. (1984) *J. Mol. Biol.* **180**, 715–740.
Polypeptide secondary structure determination by nuclear magnetic resonance observation of short proton–proton distances.
241. Pardi, A., Billeter, M. and Wüthrich, K. (1984) *J. Mol. Biol.* **180**, 741–751.
Calibration of the angular dependence of the amide proton– C^α proton coupling constants, $^3J_{\text{HN}\alpha}$, in a globular protein: use of $^3J_{\text{HN}\alpha}$ for identification of helical secondary structure.
242. Rance, M., Sørensen, O.W., Leupin, W., Kogler, H., Wüthrich, K. and Ernst, R.R. (1985) *J. Magn. Reson.* **61**, 67–80.
Uniform exitation of multiple quantum coherence: application to two-dimensional double-quantum spectroscopy.
243. Wüthrich, K. (1984) *Biomed. Res.* **5**, 151–160.
Three-dimensional structure of non crystalline polypeptides by nuclear magnetic resonance.
244. Havel, T.F. and Wüthrich, K. (1985) *J. Mol. Biol.* **182**, 281–294.
An evaluation of the combined use of nuclear magnetic resonance and distance geometry for the determination of protein conformations in solution.
245. Williamson, M.P., Havel, T.F. and Wüthrich, K. (1985) *J. Mol. Biol.* **182**, 295–315.
Solution conformation of proteinase inhibitor IIA from bull seminal plasma by ^1H nuclear magnetic resonance and distance geometry.
246. Kline, A.D. and Wüthrich, K. (1985) *J. Mol. Biol.* **183**, 503–507.
Secondary structure of the α -amylase polypeptide inhibitor Tendamistat from *Streptomyces tendae* determined in solution by ^1H nuclear magnetic resonance.

247. Denk, W., Wagner, G., Rance, M. and Wüthrich, K. (1985) *J. Magn. Reson.* **62**, 350–355.
Combined suppression of diagonal peaks and t_1 -ridges in two-dimensional nuclear Overhauser enhancement spectra.
248. Billeter, M., Engeli, M. and Wüthrich, K. (1985) *J. Mol. Graphics* **3**, 79–83, 97–98.
Interactive program for investigation of protein structures based on ^1H NMR experiments.
249. Roder, H., Wagner, G. and Wüthrich, K. (1985) *Biochemistry* **24**, 7396–7407.
Amide proton exchange in proteins by EX₁ kinetics: studies of the basic pancreatic trypsin inhibitor at variable p²H and temperature.
250. Roder, H., Wagner, G. and Wüthrich, K. (1985) *Biochemistry* **24**, 7407–7411.
Individual amide proton exchange rates in thermally unfolded basic pancreatic trypsin inhibitor.
251. Rance, M., Bodenhausen, G., Wagner, G., Wüthrich, K. and Ernst, R.R. (1985) *J. Magn. Reson.* **62**, 497–510.
A systematic approach to the suppression of J cross peaks in 2D exchange and 2D NOE spectroscopy.
252. Guerlesquin, F., Bruschi, M. and Wüthrich, K. (1985) *Biochim. Biophys. Acta* **830**, 296–303.
 ^1H NMR studies of *Desulfovibrio desulfuricans* Norway strain cytochrome c₃.
253. Müller, N., Bodenhausen, G., Wüthrich, K. and Ernst, R.R. (1985) *J. Magn. Reson.* **65**, 531–534.
The appearance of forbidden cross peaks in two-dimensional nuclear magnetic resonance spectra due to multiexponential T₂ relaxation.
254. Frey, M.H., Leupin, W., Sørensen, O.W., Denny, W.A., Ernst, R.R. and Wüthrich, K. (1985) *Biopolymers* **24**, 2371–2380.
Sequence-specific assignment of the backbone ^1H - and ^{31}P -NMR lines in a short DNA duplex with homo- and heteronuclear correlated spectroscopy.
255. Chazin, W.J., Goldenberg, D.P., Creighton, T.E. and Wüthrich, K. (1985) *Eur. J. Biochem.* **152**, 429–437.
Comparative studies of conformation and internal mobility in native and circular basic pancreatic trypsin inhibitor by ^1H nuclear magnetic resonance in solution.
256. Wagner, G., Bodenhausen, G., Müller, N., Rance, M., Sørensen, O.W., Ernst, R.R. and Wüthrich, K. (1985) *J. Am. Chem. Soc.* **107**, 6440–6446.
Exchange of two-spin order in nuclear magnetic resonance: separation of exchange and cross relaxation processes.
257. Frey, M.H., Wagner, G., Vašák, M., Sørensen, O.W., Neuhaus, D., Wörgötter, E., Kägi, J.H.R., Ernst, R.R. and Wüthrich, K. (1985) *J. Amer. Chem. Soc.* **107**, 6847–6851.
Polypeptide metal cluster connectivities in metallothionein-2 by novel ^1H – ^{113}Cd heteronuclear two-dimensional NMR experiments.
258. Neuhaus, D., Wagner, G., Vašák, M., Kägi, J.H.R. and Wüthrich, K. (1985) *Eur. J. Biochem.* **151**, 257–273.
Systematic application of high resolution, phase-sensitive two-dimensional ^1H NMR techniques for the identification of the amino acid proton spin systems in proteins: rabbit metallothionein-2.
259. Wüthrich, K. (1986) *Europhysics News* **17**, 11–13.

NMR with proteins and nucleic acids.

260. Braun, W., Wagner, G., Wörgötter, E., Vašák, M., Kägi, J.H.R. and Wüthrich, K. (1986) *J. Mol. Biol.* **187**, 125–129.
Polypeptide fold in the two metal clusters of metallothionein-2 by nuclear magnetic resonance in solution.
261. Wagner, G., Neuhaus, D., Wörgötter, E., Vašák, M., Kägi, J.H.R. and Wüthrich, K. (1986) *J. Mol. Biol.* **187**, 131–135.
Nuclear magnetic resonance identification of “half-turn” and 3_{10} -helix secondary structure in rabbit liver metallothionein-2.
262. Senn, H. and Wüthrich, K. (1985) *Q. Rev. Biophys.* **18**, 111–134.
Amino acid sequence, haem iron coordination geometry and functional properties of mitochondrial and bacterial c-type cytochromes.
263. Otting, G., Widmer, H., Wagner, G. and Wüthrich, K. (1986) *J. Magn. Reson.* **66**, 187–193.
Origin of t_1 and t_2 ridges in 2D NMR spectra and procedures for suppression.
264. Otting, G. and Wüthrich, K. (1986) *J. Magn. Reson.* **66**, 359–363.
Complete protein fingerprints by double quantum spectroscopy.
265. Wagner, G., Neuhaus, D., Wörgötter, E., Vašák, M., Kägi, J.H.R. and Wüthrich, K. (1986) *Eur. J. Biochem.* **157**, 275–289.
Sequence-specific ^1H NMR assignments in rabbit liver metallothionein-2.
266. Schultze, P. and Wüthrich, K. (1986) *J. Mol. Graphics* **4**, 105–111.
Display algorithm for space filling molecular models using a video array processor.
267. Kline, A.D., Braun, W. and Wüthrich, K. (1986) *J. Mol. Biol.* **189**, 377–382.
Studies by ^1H nuclear magnetic resonance and distance geometry of the solution conformation of the α -amylase inhibitor Tendamistat.
268. Wagner, G. and Wüthrich, K. (1986) *Eur. J. Biochem.* **157**, 618.
Reply to the comments by C.E. Dempsey on “Amide proton exchange studies by two-dimensional correlated ^1H NMR in two chemically modified analogs of the basic pancreatic trypsin inhibitor”, by G. Wagner, C.I. Stassinopoulou and K. Wüthrich.
269. Wüthrich, K. (1986) in *NMR in the Life Sciences* (E.M. Bradbury and C. Nicolini, eds.) NATO ASI Series A: Life Sciences **107**, 11–22, Plenum Press, New York.
2D NMR with biopolymers.
270. Wüthrich, K. (1986) in *Design and Synthesis of Organic Molecules Based on Molecular Recognition*, Proc. XVIIth Solvay Conference on Chemistry (G. van Binst, ed.) pp. 52–56, Springer, Berlin.
Glucagon conformation in different environments: implications for molecular recognition.
271. Chazin, W.J., Wüthrich, K., Hyberts, S., Rance, M., Denny, W.A. and Leupin, W. (1986) *J. Mol. Biol.* **190**, 439–453.
 ^1H nuclear magnetic resonance assignments for d-(GCATTAATGC)₂ using experimental refinements of established procedures.

272. Roder, H. and Wüthrich, K. (1986) *Proteins* **1**, 34–42.
Protein folding kinetics by combined use of rapid mixing techniques and NMR observation of individual amide protons.
273. Wüthrich, K. (1986) *NMR of Proteins and Nucleic Acids*, Wiley, New York.
274. Wüthrich, K. (1986) in *X National NMR Symposium of Finland* (E. Kolehmainen, ed.) pp. 1–23, Publications of the University of Kuopio, Vol. 3, Kuopio.
Nuclear magnetic resonance with proteins and nucleic acids.
275. Wörgötter, E., Wagner, G. and Wüthrich, K. (1986) *J. Am. Chem. Soc.* **108**, 6162–6167.
Simplification of two-dimensional ^1H NMR spectra using an X-filter.
276. Müller, N., Ernst, R.R. and Wüthrich, K. (1986) *J. Am. Chem. Soc.* **108**, 6482–6492.
Multiple-quantum-filtered two-dimensional correlated NMR spectroscopy of proteins.
277. Leupin, W., Chazin, W.J., Hyberts, S., Denny, W.A. and Wüthrich, K. (1986) *Biochemistry* **25**, 5902–5910.
NMR studies of the complex between the decadeoxynucleotide d-(GCATTAATGC)₂ and a minor-groove-binding drug.
278. Wagner, G. and Wüthrich, K. (1986) in *Enzyme Structure, Part L* (C.H.W. Hirs and S.N. Timasheff, eds.) *Methods in Enzymology* **131**, 307–326.
Observation of internal motility of proteins by nuclear magnetic resonance in solution.
279. Montelione, G.T., Wüthrich, K., Nice, E.C., Burgess, A.W. and Scheraga, H.A. (1986) *Proc. Natl. Acad. Sci. USA* **83**, 8594–8598.
Identification of two antiparallel β -sheet conformations in the solution structure of murine epidermal growth factor by proton magnetic resonance.
280. Widmer, H. and Wüthrich, K. (1986) *J. Magn. Reson.* **70**, 270–279.
Simulation of two-dimensional NMR experiments using numerical density matrix calculations.
281. Kline, A.D. and Wüthrich, K. (1986) *J. Mol. Biol.* **192**, 869–890.
Complete sequence-specific ^1H nuclear magnetic resonance assignments for the α -amylase polypeptide inhibitor Tendamistat from *Streptomyces tendae*.
282. Senn, H., Eugster, A., Otting, G., Suter, F. and Wüthrich, K. (1987) *Eur. Biophys. J.* **14**, 301–306.
 ^{15}N -labeled P22 c2 repressor for nuclear magnetic resonance studies of protein–DNA interactions.
283. Otting, G., Senn, H., Wagner, G. and Wüthrich, K. (1986) *J. Magn. Reson.* **70**, 500–505.
Editing of 2D ^1H NMR spectra using X half-filters: combined use with residue-selective ^{15}N -labeling of proteins.
284. Senn, H., Otting, G. and Wüthrich, K. (1987) *J. Am. Chem. Soc.* **109**, 1090–1092.
Protein structure and interactions by combined used of sequential NMR assignments and isotope labeling.
285. Leupin, W., Wagner, G., Denny, W.A. and Wüthrich, K. (1987) *Nucl. Acids Res.* **15**, 267–275.

Assignment of the ^{13}C nuclear magnetic resonance spectrum of a short DNA-duplex with ^1H detected two-dimensional heteronuclear correlation spectroscopy.

286. Wüthrich, K. (1987) in *Structure, Dynamics and Function of Biomolecules* (A. Ehrenberg, R. Rigler, A. Gräslund and L. Nilsson, eds.) pp. 104–107, Springer, Berlin.
A NMR view of proteins in solution.
287. Wüthrich, K. (1986) *Rev. Magn. Reson. in Medicine* **1**, 1–20 .
Structure and function of proteins and nucleic acids viewed by NMR in solution.
288. Wüthrich, K. (1986) in *Structure and Dynamics of Nucleic Acids, Proteins and Membrane*, E. Clementi and S. Chin, eds.) pp. 21–29, Plenum Press, New York.
Conformation of non-crystalline proteins viewed by NMR.
289. Billeter, M., Havel, T.F. and Wüthrich, K. (1987) *J. Comp. Chem.* **8**, 132–141.
The ellipsoid algorithm as a method for the determination of polypeptide conformations from experimental distance constraints and energy minimization.
290. Lee, K.H., Fitton, J.E. and Wüthrich, K. (1987) *Biochim. Biophys. Acta* **911**, 144–153.
Nuclear magnetic resonance investigation of the conformation of δ - haemolysin bound to dodecylphosphocholine micelles.
291. Wagner, G., Braun, W., Havel, T.F., Schaumann, T., Go- , N. and Wüthrich, K. (1987) *J. Mol. Biol.* **196**, 611–639.
Protein structures in solution by nuclear magnetic resonance and distance geometry: the polypeptide fold of the basic pancreatic trypsin inhibitor determined using two different algorithms, DISGEO and DISMAN.
292. Vašák, M., Wörgötter, E., Wagner, G., Kägi, J.H.R. and Wüthrich, K. (1987) *J. Mol. Biol.* **196**, 711–719.
Metal coordination in rat liver metallothionein-2 prepared with or without reconstitution of the metal clusters, and comparison with rabbit liver metallothionein-2.
293. Chazin, W.J. and Wüthrich, K. (1987) *J. Magn. Reson.* **72**, 358–363.
Optimization of homonuclear relayed coherence transfer experiments with proteins in H_2O solution.
294. Otting, G., Grüter, R., Leupin, W., Minganti, C., Ganesh, K.N., Sproat, B.S., Gait , M.J. and Wüthrich, K. (1987) *Eur. J. Biochem.* **166**, 215–220.
Sequential NMR assignments of labile protons in DNA using two-dimensional nuclear Overhauser enhancement spectroscopy with three jump-and-return pulse sequences.
295. Widmer, H. and Wüthrich, K. (1987) *J. Magn. Reson.* **74**, 316–336.
Simulated two-dimensional NMR cross peak fine structures for ^1H spin systems in polypeptides and polydeoxynucleotides.
296. Wagner, G., Brühwiler, D. and Wüthrich, K. (1987) *J. Mol. Biol.* **196**, 227–231.
Reinvestigation of the aromatic side-chains in the basic pancreatic trypsin inhibitor by heteronuclear two-dimensional nuclear magnetic resonance.

297. Widmer, H., Wagner, G. and Wüthrich, K. (1984) in *Proceedings XXII Congress Ampère on Magnetic Resonance and Related Phenomena*, (K.A. Müller, R. Kind and J. Roos, eds.) pp. 498–499, Schippert, Zürich.
 Application of DQF-COSY, RELAYED-COSY and DOUBLE-RELAYED-COSY for the assignment of protein ¹H-NMR spectra.
298. Frey, M.H., Sørensen, O.W., Leupin, W., Denny, W.A., Rance, M., Ernst, R.R. and Wüthrich, K. (1984) in *Proceedings XXII Congress Ampère on Magnetic Resonance and Related Phenomena*, (K.A. Müller, R. Kind and J. Roos, eds.) pp. 500–501, Schippert, Zürich.
 Sequential resonance assignments of oligonucleotides with homonuclear and heteronuclear 2D NMR.
299. Bodenhausen, G., Rance, M., Levitt, M.H., Sørensen, O.W., Meier, B.U., Pfändler, P., Denk, W., Wagner, G., Wüthrich, K. and Ernst, R.R. (1984) in *Proceedings XXII Congress Ampère on Magnetic Resonance and Related Phenomena*, (K.A. Müller, R. Kind and J. Roos, eds.) pp. 566–567, Schippert, Zürich.
 New approaches to the measurement of cross-relaxation rates by two-dimensional NMR.
300. Otting, G., Marchot, P., Bougis, P.E., Rochat, H. and Wüthrich, K. (1987) *Eur. J. Biochem.* **168**, 603–607.
 Monitoring the purification by high-performance liquid chromatography of cardiotoxins from *Naja mossambica mossambica* using phase-sensitive two-dimensional nuclear magnetic resonance.
301. Otting, G., Steinmetz, W.E., Bougis, P.E., Rochat, H. and Wüthrich, K. (1987), *Eur. J. Biochem.* **168**, 609–620.
 Sequence-specific ¹H-NMR assignments and determination of the secondary structure in aqueous solution of the cardiotoxins CTXIIa and CTXIIb from *Naja mossambica mossambica*.
302. Wang Q., Kline, A.D. and Wüthrich, K. (1987) *Biochemistry* **26**, 6488–6493.
 Amide proton exchange in the α-amylase polypeptide inhibitor Tendamistat studied by two-dimensional ¹H nuclear magnetic resonance.
303. Wüthrich, K. (1987) *Optica Pura Y Aplicada* **20**, 145–151.
 Nuclear magnetic resonance with proteins and nucleic acids.
304. Wüthrich, K. (1987) in *DNA-Protein Interactions and Gene Regulation*, (E.B. Thompson and J. Papaconstantinou, eds.) pp. 87–94, University Press, Austin.
 Nuclear magnetic resonance techniques for studies of protein–DNA interactions.
305. Montelione, G.T., Wüthrich, K., Nice, E.C., Burgess, A.W. and Scheraga, H.A. (1987) *Proc. Natl. Acad. Sci. USA* **84**, 5226–5230.
 Solution structure of murine epidermal growth factor: determination of the polypeptide backbone chain-fold by nuclear magnetic resonance and distance geometry.
306. Wörgötter, E., Wagner, G., Vašák, M., Kägi, J.H.R. and Wüthrich, K. (1987) *Eur. J. Biochem.* **167**, 457–466.
 Sequence-specific ¹H NMR assignments in rat liver metallothionein-2.

307. Wagner, G., Frey, M.E., Neuhaus, D., Wörgötter, E., Braun, W., Vašák, M., Kägi, J.H.R. and Wüthrich, K. (1987) in *Metallothionein II*, (J.H.R. Kägi and Y. Kojima, eds.) *Experientia Suppl.* **52**, 149–157.
Spatial structure of rabbit liver metallothionein-2 in solution by NMR.
308. Wüthrich, K. (1987) *Q. Rev. Biophys.* **19**, 3–5.
Nuclear magnetic resonance — from molecules to man.
309. Wüthrich, K. (1987) *Life Sci. Adv. Biochem.* **6**, 83–87.
Nuclear magnetic resonance with proteins and nucleic acids.
- 310 Wörgötter, E., Wagner, G., Vašák, M., Kägi, J.H.R. and Wüthrich, K. (1988) *J. Am. Chem. Soc.* **110**, 2388–2393.
Heteronuclear filters for two-dimensional ^1H NMR: identification of the metal-bound amino acids in metallothionein and observation of small heteronuclear long-range couplings.
311. Steinmetz, W.E., Bougis, P.E., Rochat, H., Redwine, O.D., Braun, W. and Wüthrich, K. (1988) *Eur. J. Biochem.* **172**, 101–116.
 ^1H nuclear magnetic resonance studies of the three-dimensional structure of the cardiotoxin CTXIIb from *Naja mossambica mossambica* in aqueous solution and comparison with the crystal structures of homologous toxins.
312. Siekmann, J., Wenzel, H.R., Schröder, W., Schutt, H., Truscheit, E., Arens, A., Rauenbusch, E., Chazin, W.J., Wüthrich, K. and Tschesche, H. (1987) *Biol. Chem. Hoppe-Seyler* **368**, 1589–1596.
Pyroglutamyl-aprotinin, a new aprotinin homologue from bovine lungs — isolation, properties, sequence analysis and characterization using ^1H nuclear magnetic resonance in solution.
313. Widmer, H., Wagner, G., Schweitz, H., Lazdunski, M. and Wüthrich, K. (1988) *Eur. J. Biochem.* **171**, 177–192.
The secondary structure of the toxin ATX Ia from *Anemonia sulcata* in aqueous solution determined on the basis of complete sequence-specific ^1H NMR assignments.
314. Otting, G. and Wüthrich, K. (1987) *J. Magn. Reson.* **75**, 546–549.
Pre-TOCSY, a new experiment for obtaining complete 2D ^1H NMR spectra of proteins in H_2O solution.
315. Arseniev, A., Schultze, P., Wörgötter, E., Braun, W., Wagner, G., Vašák M., Kägi, J.H.R. and Wüthrich, K. (1988) *J. Mol. Biol.* **201**, 637–657.
Three-dimensional structure of rabbit liver $[\text{Cd}_7]$ -metallothionein-2a in aqueous solution determined by nuclear magnetic resonance.
316. Otting, G. and Wüthrich, K. (1988) *J. Magn. Reson.* **76**, 569–574 .
Efficient purging scheme for proton-detected heteronuclear two-dimensional NMR.
317. Montelione, G.T., Wüthrich, K. and Scheraga, H.A. (1988) *Biochemistry* **27**, 2235–2243.
Sequence-specific ^1H NMR assignments and identification of slowly exchanging amide protons in murine epidermal growth factor.
318. Wüthrich, K. (1988) *Physikalische Blätter* **44**, 103–109.
Proteinstrukturmittelung in Lösung mittels kernmagnetischer Resonanzspektroskopie.

319. Celda, B., Widmer, H., Leupin, W., Chazin, W.J., Denny, W.A. and Wüthrich, K. (1989) *Biochemistry* **28**, 1462–1471.
Conformational studies of d-(AAAAATTTT)₂ using constraints from nuclear Overhauser effects and from quantitative analysis of the cross-peak fine structures in two-dimensional ¹H nuclear magnetic resonance spectra.
320. Kline, A.D., Braun, W. and Wüthrich, K. (1988) *J. Mol. Biol.* **204**, 675–724.
Determination of the complete three-dimensional structure of the α -amylase inhibitor Tendamistat in aqueous solution by nuclear magnetic resonance and distance geometry.
321. Schultze, P., Wörgötter, E., Braun, W., Wagner, G., Vašák, M., Kägi, J.H.R. and Wüthrich, K. (1988) *J. Mol. Biol.* **203**, 251–268.
Conformation of [Cd₇]-metallothionein-2 from rat liver in aqueous solution determined by nuclear magnetic resonance spectroscopy.
322. Grütter, R., Otting, G., Wüthrich, K. and Leupin, W. (1988) *Eur. Biophys. J.* **16**, 279–286.
O_R3 operator of bacteriophage λ in a 23 base-pair DNA fragment: sequence-specific ¹H NMR assignments for the non-labile protons and comparison with the isolated 17 base-pair operator.
323. Wüthrich, K. (1988) in *Water and Ions in Biological Systems*, (P. Läuger, L. Packer and V. Vasilescu, eds.) pp. 33–41, Birkhäuser, Basel.
Protein molecules in aqueous solution viewed by nuclear magnetic resonance.
324. Wüthrich, K. (1988) *GIT Fachz. Lab.* **5**, 481–488.
Dreidimensionale Proteinstrukturen in Lösung.
325. Wüthrich, K. (1988) in *NMR Spectroscopy in Drug Research*, (J.W. Jaroszewski, K. Schaumburg and H. Kofod, eds.) pp. 194–208, Munksgaard, Copenhagen.
Three-dimensional protein structures in solution viewed by NMR.
326. Labhardt, A.M., Hunziker-Kwik, E.H. and Wüthrich, K. (1988) *Eur. J. Biochem.* **177**, 295–305.
Secondary structure determination for α -neurotoxin from *Dendroaspis polylepis polylepis* based on sequence-specific ¹H-nuclear-magnetic-resonance assignments.
327. Martin, E., Bösch, C., Duc, G., Wüthrich, K., Brunner, P. and Fanconi, A. (1988) *Helv. paediat. Acta* **43**, 53–74.
Magnetresonanz in der pädiatrischen Forschung und Klinik. I. Teil: Was können wir von dieser neuen Methode erwarten?
328. Griesinger, C., Otting, G., Wüthrich, K. and Ernst, R.R. (1988) *J. Am. Chem. Soc.* **110**, 7870–7872.
Clean-TOCSY for ¹H spin system identification in macromolecules.
329. Müller, M., Affolter, M., Leupin, W., Otting, G., Wüthrich, K. and Gehring, W.J. (1988) *EMBO J.* **7**, 4299–4304.
Isolation and sequence-specific DNA binding of the *Antennapedia* homeodomain.
330. Otting, G., Qian, Y.Q., Müller, M., Affolter, M., Gehring, W.J. and Wüthrich, K. (1988) *EMBO J.* **7**, 4305–4309.
Secondary structure determination for the *Antennapedia* homeodomain by nuclear magnetic resonance and evidence for a helix-turn-helix motif.

331. Wüthrich, K. (1988) in *Protein Structure and Protein Engineering*, 39 Colloquium Mosbach (E.L. Winnacker and R. Huber, eds.) pp. 37–44, Springer, Heidelberg.
The method of protein structure determination by NMR in solution: initial new insights relating to molecular mobility.EMBO
332. Wüthrich, K. (1989) *Science* **243**, 45–50.
Protein structure determination in solution by nuclear magnetic resonance spectroscopy.
333. Wüthrich, K. (1989) *Acc. Chem. Res.* **22**, 36–44.
The development of nuclear magnetic resonance spectroscopy as a technique for protein structure determination.
334. Otting, G. and Wüthrich, K. (1989) *J. Am. Chem. Soc.* **111**, 1871–1875.
Studies of protein hydration in aqueous solution by direct NMR observation of individual protein-bound water molecules.
335. Billeter, M., Kline, A.D., Braun, W., Huber, R. and Wüthrich, K. (1989) *J. Mol. Biol.* **206**, 677–687.
Comparison of the high-resolution structures of the α -amylase inhibitor Tendamistat determined by nuclear magnetic resonance in solution and by X-ray diffraction in single crystals.
336. Braun, W., Epp, O., Wüthrich, K. and Huber, R. (1989) *J. Mol. Biol.* **206**, 669–676.
Solution of the phase problem in the X-ray diffraction method for proteins with the nuclear magnetic resonance solution structure as initial model.
337. Haruyama, H. and Wüthrich, K. (1989) *Biochemistry* **28**, 4301–4312.
Conformation of recombinant desulfatohirudin in aqueous solution determined by nuclear magnetic resonance.
338. Haruyama, H., Qian, Y.Q. and Wüthrich, K. (1989) *Biochemistry* **28**, 4312–4317.
Static and transient hydrogen-bonding interactions in recombinant desulfatohirudin studied by ^1H nuclear magnetic resonance measurements of amide proton exchange rates and pH-dependent chemical shifts.
339. Güntert, P., Braun, W., Billeter, M. and Wüthrich, K. (1989) *J. Am. Chem. Soc.* **111**, 3997–4004.
Automated stereospecific ^1H NMR assignments and their impact on the precision of protein structure determinations in solution.
340. Senn, H., Werner, B., Messerle, B.A., Weber, C., Traber, R. and Wüthrich, K. (1989) *FEBS Lett.* **249**, 113–118.
Stereospecific assignment of the methyl ^1H NMR lines of valine and leucine in polypeptides by nonrandom ^{13}C labelling.
341. Schaumann, T., Braun, W. and Wüthrich, K. (1990) *Biopolymers* **29**, 679–694.
The program FANTOM for energy refinement of polypeptides and proteins using a Newton-Raphson minimizer in torsion angle space.
342. Billeter, M., Schaumann, T., Braun, W. and Wüthrich, K. (1990) *Biopolymers* **29**, 695–706.
Restrained energy refinement with two different algorithms and force fields of the structure of the α -amylase inhibitor tendamistat determined by NMR in solution.

343. Bösch, C., Grütter, R., Martin, E., Duc, G. and Wüthrich, K. (1989) *Radiology* **172**, 197–199.
Variations in the *in vivo* P-31 MR spectra of the developing human brain during postnatal life.
344. Neri, D., Szyperski, T., Otting, G., Senn, H. and Wüthrich, K. (1989) *Biochemistry* **28**, 7510–7516.
Stereospecific nuclear magnetic resonance assignments of the methyl groups of valine and leucine in the DNA-binding domain of the 434 repressor by biosynthetically directed fractional ¹³C labeling.
345. Wüthrich, K. (1988) in *Proceedings of the 8th International Biotechnology Symposium*, (G. Durand, L. Bobichon and J. Florent, eds.) pp. 270–278, Société Française de Microbiologie, Paris.
Protein structure determination by nuclear magnetic resonance in solution.
346. Billeter, M. and Wüthrich, K. ((1989) in *Computer-Aided Molecular Design*, (W.G. Richards, ed.) pp. 197–201, IBC Technical Services Ltd., Oxford.
Interactive computer graphics for the determination of biopolymer conformations from NMR data measured in solution.
347. Qian, Y.Q., Billeter, M., Otting, G., Müller, M., Gehring, W.J. and Wüthrich, K. (1989) *Cell* **59**, 573–580.
The structure of the *Antennapedia* homeodomain determined by NMR spectroscopy in solution: comparison with prokaryotic repressors.
348. Widmer, H., Billeter, M. and Wüthrich, K. (1989) *Proteins* **6**, 357–371.
Three-dimensional structure of the neurotoxin ATX Ia from *Anemonia sulcata* in aqueous solution determined by nuclear magnetic resonance spectroscopy.
349. Wider, G., Neri, D., Otting, G. and Wüthrich, K. (1989) *J. Magn. Reson.* **85**, 426–431.
heteronuclear three-dimensional NMR experiment for measurements of small heteronuclear coupling constants in biological macromolecules.
350. Wüthrich, K. (1989) *Chemica Scripta* **29A**, 23–26.
Three-dimensional structures of non-crystalline proteins observed by nuclear magnetic resonance.
351. Otting, G. and Wüthrich, K. (1989) *J. Magn. Reson.* **85**, 586–594.
Extended heteronuclear editing of 2D ¹H NMR spectra of isotope-labeled proteins, using the X(ω_1, ω_2)-double-half-filter.
352. Neri, D., Otting, G. and Wüthrich, K. (1990) *Tetrahedron* **46**, 3287–3296.
¹H and ¹³C NMR chemical shifts of the diastereotopic methyl groups of valyl and leucyl residues in peptides and proteins.
353. Messerle, B.A., Wider, G., Otting, G., Weber, C. and Wüthrich, K. (1989) *J. Magn. Reson.* **85**, 608–613.
Solvent suppression using a spin lock in 2D and 3D NMR spectroscopy with H₂O solutions.
354. Otting, G. and Wüthrich, K. (1990) *Q. Rev. Biophys.* **23**, 39–96.
Heteronuclear filters in two-dimensional [¹H, ¹H]-NMR spectroscopy: combined use with isotope labelling for studies of macromolecular conformation and intermolecular interactions.

355. Billeter, M., Qian, Y.Q., Otting, G., Müller, M., Gehring, W.J. and Wüthrich, K. (1990) *J. Mol. Biol.* **214**, 183–197.
Determination of the three-dimensional structure of the *Antennapedia* homeodomain from *Drosophila* in solution by ^1H nuclear magnetic resonance spectroscopy.
356. Messerle, B.A., Schäffer, A., Vašák, M., Kägi, J.H.R. and Wüthrich, K. (1990) *J. Mol. Biol.* **214**, 765–779.
Three-dimensional structure of human [$^{113}\text{Cd}_7$]-metallothionein-2 in solution determined by nuclear magnetic resonance spectroscopy.
357. Messerle, B.A., Bos, M., Schäffer, A., Vavšák, M., Kägi, J.H.R. and Wüthrich, K. (1990) *J. Mol. Biol.* **214**, 781–786.
Amide proton exchange in human metallothionein-2 measured by nuclear magnetic resonance spectroscopy.
358. Wüthrich, K. (1989) *Methods in Enzymology* **177**, 125–131.
Determination of three-dimensional protein structures in solution by nuclear magnetic resonance: an overview.
359. Otting, G. and Wüthrich, K. (1990) in *Water and Ions in Biomolecular Systems* (D. Vasilescu, J. Jaz, L. Packer and B. Pullman, eds.) pp. 141–147, Birkhäuser, Basel.
Studies of protein hydration by direct NMR observation of individual protein-bound water molecules.
360. Neri, D., Otting, G. and Wüthrich, K. (1990) *J. Am. Chem. Soc.* **112**, 3663–3665.
New nuclear magnetic resonance experiment for measurements of the vicinal coupling constants $^3J_{\text{HN}\alpha}$ in proteins.
361. Leupin, W., Otting, G., Amacker, H. and Wüthrich, K. (1990) *FEBS Lett.* **263**, 313–316.
Application of $^{13}\text{C}(\omega_1)$ -half-filtered $[^1\text{H}, ^1\text{H}]$ -NOESY for studies of a complex formed between DNA and a ^{13}C -labeled minor-groove-binding drug.
362. Wüthrich, K. (1990) *Biochem. Pharmacol.* **40**, 55–62.
Structure and dynamics in proteins of pharmacological interest.
363. Wüthrich, K. (1989) in *Protein Structure and Engineering*, (O. Jardetzky, ed.) NATO ASI Series: Life Sciences **A183**, 69–78.
NMR method for protein structure determination in solution.
364. Grütter, R., Bösch, Ch., Müri, M., Martin, E. and Wüthrich, K. (1990) *Magn. Reson. in Medicine* **15**, 128–134.
A simple design for a double-tunable probe head for imaging and spectroscopy at high fields.
365. Otting, G., Orbons, L.P.M. and Wüthrich, K. (1990) *J. Magn. Reson.* **89**, 423–430.
Suppression of zero-quantum coherence in NOESY and soft-NOESY.
366. Vendrell, J., Wider, G., Avilés, F.X. and Wüthrich, K. (1990) *Biochemistry* **29**, 7515–7522.
Sequence-specific ^1H NMR assignments and determination of the secondary structure for the activation domain isolated from pancreatic procarboxypeptidase B.

367. Gehring, W.J., Müller, M., Affolter, M., Percival-Smith, A., Billeter, M., Qian, Y.Q., Otting, G. and Wüthrich, K. (1990) *Trends in Genetics* **6**, 323–329.
The structure of the homeodomain and its functional implications.
368. Otting, G., Qian, Y.Q., Billeter, M., Müller, M., Affolter, M., Gehring, W.J. and Wüthrich, K. (1990) *EMBO J.* **9**, 3085–3092.
Protein–DNA contacts in the structure of a homeodomain–DNA complex determined by nuclear magnetic resonance spectroscopy in solution.
369. Wüthrich, K. (1990) *Current Science* **59**, 825–831.
The Ramachandran plot and the NMR method for protein structure determination.
370. Wider, G., Weber, C., Traber, R., Widmer, H. and Wüthrich, K. (1990) *J. Am. Chem. Soc.* **112**, 9015–9016.
Use of a double-half-filter in two-dimensional ^1H nuclear magnetic resonance studies of receptor-bound cyclosporin.
371. Wüthrich, K. (1990) *J. Biol. Chem.* **265**, 22059–22062.
Protein structure determination in solution by NMR spectroscopy.
372. Vendrell, J., Billeter, M., Wider, G., Avilés, F.X. and Wüthrich, K. (1991) *EMBO J.* **10**, 11–15.
The NMR structure of the activation domain isolated from porcine procarboxypeptidase B.
373. Grütter, R., Bösch, C., Martin, E. and Wüthrich, K. (1990) *NMR in Biomedicine* **3**, 265–271.
A method for rapid evaluation of saturation factors in *in vivo* surface coil NMR spectroscopy using B_1 -insensitive pulse cycles.
374. Güntert, P., Braun, W. and Wüthrich, K. (1991) *J. Mol. Biol.* **217**, 517–530.
Efficient computation of three-dimensional protein structures in solution from nuclear magnetic resonance data using the program DIANA and the supporting programs CALIBA, HABAS and GLOMSA.
375. Güntert, P., Qian, Y.Q., Otting, G., Müller, M., Gehring, W.J. and Wüthrich, K. (1991) *J. Mol. Biol.* **217**, 531–540.
Structure determination of the *Antp(C39→S)* homeodomain from nuclear magnetic resonance data in solution using a novel strategy for the structure calculation with the programs DIANA, CALIBA, HABAS and GLOMSA.
376. Affolter, M., Percival-Smith, A., Müller, M., Billeter, M., Qian, Y.Q., Otting, G., Wüthrich, K. and Gehring, W.J. (1991) *Cell* **64**, 879–880.
Similarities between the homeodomain and the *hin* recombinase DNA-binding domain.
377. Wüthrich, K. (1991) Japanese Edition of 'NMR of Proteins and Nucleic Acids' (translation by Y. Kyogoku and Y. Kobayashi). Kagaku Dozin, Tokyo, Japan.
378. Wider, G., Neri, D. and Wüthrich, K. (1991) *J. Biomol. NMR* **1**, 93–98.
Studies of slow conformational equilibria in macromolecules by exchange of heteronuclear longitudinal 2-spin-order in a 2D difference correlation experiment.

379. Chary, K.V.R., Otting, G. and Wüthrich, K. (1991) *J. Magn. Reson.* **93**, 218–224.
Measurement of small heteronuclear ^1H – ^{15}N coupling constants in ^{15}N -labeled proteins by 3D $\text{H}_\text{NNH}_{\text{AB}}$ -COSY.
380. Weber, C., Wider, G., von Freyberg, B., Traber, R., Braun, W., Widmer, H. and Wüthrich, K. (1991) *Biochemistry* **30**, 6563–6574.
The NMR structure of cyclosporin A bound to cyclophilin in aqueous solution.
381. Otting, G., Liepinsh, E. and Wüthrich, K. (1991) *J. Am. Chem. Soc.* **113**, 4363–4364.
Proton exchange with internal water molecules in the protein BPTI in aqueous solution.
382. Wider, G., Weber, C. and Wüthrich, K. (1991) *J. Am. Chem. Soc.* **113**, 4676–4678.
Proton-proton Overhauser effects of receptor-bound cyclosporin A observed with the use of a heteronuclear-resolved half-filter experiment.
383. Wüthrich, K. (1991) in *Proteins, Structure, Dynamics and Design* (V. Renugopalakrishnan, P.R. Carey, I.C.P. Smith, S.G. Huang and A.C. Storer, eds.) pp. 3–10, ESCOM, Leiden.
NMR structures of proteins: Improved precision through stereospecific resonance assignments.
384. Eccles, C., Güntert, P., Billeter, M. and Wüthrich, K. (1991) *J. Biomol. NMR* **1**, 111–130.
Efficient analysis of protein 2D NMR spectra using the software package *EASY*.
385. Neri, D., Billeter, M. and Wüthrich, K. (1992) *J. Mol. Biol.* **223**, 743–767.
Determination of the NMR solution structure of the DNA-binding domain 1–69 of the 434 repressor and comparison with the X-ray crystal structure.
386. Otting, G., Liepinsh, E., Farmer II, B.T. and Wüthrich, K. (1991) *J. Biomol. NMR* **1**, 209–215.
Protein hydration studied with homonuclear 3D ^1H NMR experiments.
387. Wüthrich, K., Spitzfaden, C., Memmert, K., Widmer, H. and Wider, G. (1991) *FEBS Lett.* **285**, 237–247.
Protein secondary structure determination by NMR: application with recombinant human cyclophilin.
388. Sodano, P., Chary, K.V.R., Björnberg, O., Holmgren, A., Kren, B., Fuchs, J.A. and Wüthrich, K. (1991) *Eur. J. Biochem.* **200**, 369–377.
Nuclear magnetic resonance studies of recombinant *Escherichia coli* glutaredoxin: sequence-specific assignments and secondary structure determination of the oxidized form.
389. Kallen, J., Spitzfaden, C., Zurini, M.G.M., Wider, G., Widmer, H., Wüthrich, K. and Walkinshaw, M.D. (1991) *Nature* **353**, 276–279.
Structure of human cyclophilin and its binding site for cyclosporin A determined by X-ray crystallography and NMR spectroscopy.
390. Mertz, J.E., Güntert, P., Wüthrich, K. and Braun, W. (1991) *J. Biomol. NMR* **1**, 257–269.
Complete relaxation matrix refinement of NMR structures of proteins using analytically calculated dihedral angle derivatives of NOE intensities.
391. Wüthrich, K. (1991) in *Protein Conformation*, Ciba Foundation Symposium **161**, pp. 136–149, Wiley, Chichester.
Six years of protein structure determination by NMR spectroscopy: What have we learned?

392. Sodano, P., Xia, T., Bushweller, J.H., Björnberg, O., Holmgren, A., Billeter , M. and Wüthrich, K. (1991) *J. Mol. Biol.* **221**, 1311–1324.
Sequence-specific ^1H NMR assignments and determination of the three-dimensional structure of reduced *Escherichia coli* glutaredoxin.
393. Wüthrich, K., v. Freyberg, B., Weber, C., Wider, G., Traber, R., Widmer, H. and Braun, W. (1991) *Science* **254**, 953–954.
Receptor-induced conformation change of the immunosuppressant cyclosporin A.
394. Otting, G., Liepinsh, E. and Wüthrich, K. (1991) *Science* **254**, 974–980.
Protein hydration in aqueous solution.
395. Güntert, P. and Wüthrich, K. (1991) *J. Biomol. NMR* **1**, 447–456.
Improved efficiency of protein structure calculations from NMR data using the program DIANA with redundant dihedral angle constraints.
396. Billeter, M., Vendrell, J., Wider, G., Avilés, F.X., Coll, M., Guasch, A., Huber , R. and Wüthrich, K. (1992) *J. Biomol. NMR* **2**, 1–10.
Comparison of the NMR solution structure with the X-ray crystal structure of the activation domain from procarboxypeptidase B.
397. Montelione, G.T., Wüthrich, K., Burgess, A.W., Nice, E.C., Wagner, G., Gibson, D. and Scheraga, H.A. (1992) *Biochemistry* **31**, 236–249.
Solution structure of murine epidermal growth factor determined by NMR spectroscopy and refined by energy minimization with restraints.
398. Wüthrich, K. (1991) *Methods in Enzymology* **205**, 502–520.
Determination of the three-dimensional structure of metallothioneins by nuclear magnetic resonance spectroscopy in solution.
399. Spitzfaden, C., Weber, H.P., Braun, W., Kallen, J., Wider, G., Widmer, H., Walkinshaw, M.D. and Wüthrich, K. (1992) *FEBS Lett.* **300**, 291–300.
Cyclosporin A–cyclophilin complex formation. A model based on X-ray and NMR data.
400. Wüthrich, K. and Otting, G. (1992) *Int. J. Quant. Chem.* **42**, 1553–1561.
Studies of protein hydration in aqueous solution by high-resolution nuclear magnetic resonance spectroscopy.
401. Otting, G., Liepinsh, E. and Wüthrich, K. (1992) *J. Am. Chem. Soc.* **114**, 7093–7095.
Polypeptide hydration in mixed solvents at low temperatures.
402. Güntert, P. and Wüthrich, K., (1992) *J. Magn. Reson.* **96**, 403–407.
FLATT—A new procedure for high-quality baseline correction of multidimensional NMR spectra.
403. Neri, D., Wider, G. and Wüthrich, K. (1992) *Proc. Natl. Acad. Sci. USA* **89**, 4397–4401.
Complete ^{15}N and ^1H NMR assignments for the amino-terminal domain of the phage434 repressor in the urea-unfolded form.

404. Xia, T., Bushweller, J.H., Sodano, P., Billeter, M., Björnberg, O., Holmgren, A. and Wüthrich, K. (1992) *Protein Science* **1**, 310–321.
NMR structure of oxidized *Escherichia coli* glutaredoxin: comparison with reduced *E. coli* glutaredoxin and functionally related proteins.
405. Billeter, M., Neri, D., Otting, G., Qian, Y.Q. and Wüthrich, K., (1992) *J. Biomol. NMR* **2**, 257–274.
Precise vicinal coupling constants $^3J_{HN\alpha}$ in proteins from nonlinear fits of J-modulated [^{15}N , ^1H]-COSY experiments.
406. Neri, D., Wider , G. and Wüthrich, K. (1992) *FEBS Lett.* **303**, 129–135.
 ^1H , ^{15}N and ^{13}C NMR assignments of the 434 repressor fragments 1–63 and 44–64 unfolded in 7 M urea.
407. Messerle, B.A., Schäffer, A., Vašák, M., Kägi, J.H.R. and Wüthrich, K. (1992) *J. Mol. Biol.* **225**, 433–443.
Comparison of the solution conformations of human [Zn₇]-metallothionein-2 and [Cd₇]-metallothionein-2 using nuclear magnetic resonance spectroscopy.
408. Szyperski, T., Neri, D., Leiting, B., Otting, G. and Wüthrich, K. (1992) *J. Biomol. NMR* **2**, 323–334.
Support of ^1H NMR assignments in proteins by biosynthetically directed fractional ^{13}C -labeling.
409. Liepinsh, E., Otting, G. and Wüthrich, K. (1992) *J. Biomol. NMR* **2**, 447–465.
NMR spectroscopy of hydroxyl protons in aqueous solutions of peptides and proteins.
410. Vendrell, J., Guasch, A., Coll, M., Villegas, V. Billeter, M., Wider, G., Huber, R., Wüthrich, K. and Avilés, F. (1992) *Biol. Chem. Hoppe-Seyler* **373**, 387–392.
Pancreatic procarboxypeptidases: their activation processes related to the structural features of the zymogens and activation segments.
411. Berndt, K.D., Güntert, P., Orbons, L.P.M. and Wüthrich, K. (1992) *J. Mol. Biol.* **227**, 757–775.
Determination of a high-quality nuclear magnetic resonance solution structure of the bovine pancreatic trypsin inhibitor and comparison with three crystal structures.
412. Szyperski, T., Güntert, P., Otting, G. and Wüthrich, K. (1992) *J. Magn. Reson.* **99**, 552–560.
Determination of scalar coupling constants by inverse Fourier transformation of in-phase multiplets.
413. Bushweller, J.H., Åslund, F., Wüthrich, K. and Holmgren, A. (1992) *Biochemistry* **31**, 928–93 .
Structural and functional characterization of the mutant *Escherichia coli* glutaredoxin (C14→S) and its mixed disulfide with glutathione.
414. Brown, L.R. and Wüthrich, K. (1992) *J. Mol. Biol.* **227**, 1118–1135.
Nuclear magnetic resonance solution structure of the α -neurotoxin from the black mamba (*Dendroaspis polylepis polylepis*).
415. Neri, D., Billeter, M., Wider, G. and Wüthrich, K. (1992) *Science* **257**, 1559–1563.
NMR determination of residual structure in a urea-denatured protein, the 434 repressor.

416. Wüthrich, K., Szyperski, T., Leiting, B. and Otting, G., (1992) in *Frontiers and New Horizons in Amino Acid Research* (Proc. 1st Biennial International Conference on Amino Acid Research, Frontiers and Horizons, K. Takai, ed.), pp.41–48, Elsevier, Amsterdam.
Biosynthetic pathways of the common proteinogenic amino acids investigated by fractional ^{13}C labeling and NMR spectroscopy.
417. Wüthrich, K., Otting, G. and Liepinsh, E. (1992) *Faraday Discuss.* **93**, 35–45.
Protein hydration in aqueous solution.
418. Braun, W., Vašák, M., Robbins, A.H., Stout, C.D., Wagner, G., Kägi, J.H.R. and Wüthrich, K. (1992) *Proc. Natl. Acad. Sci. USA* **89**, 10124–10128.
Comparison of the NMR solution structure and the X-ray crystal structure of rat metallothionein-2.
419. Qian, Y.Q., Otting, G., Furukubo-Tokunaga, K., Affolter, M., Gehring, W.J. and Wüthrich, K. (1992) *Proc. Natl. Acad. Sci. USA* **89**, 10738–10742.
NMR structure determination reveals that the homeodomain is connected through a flexible linker to the main body in the *Drosophila* Antennapedia protein.
420. Güntert, P., Dötsch, V., Wider, G. and Wüthrich, K. (1992) *J. Biomol. NMR* **2**, 619–629.
Processing of multi-dimensional NMR data with the new software PROSA.
421. Liepinsh, E., Otting, G. and Wüthrich, K. (1992) *Nucl. Acids Res.* **20**, 6549–6553.
NMR observation of individual molecules of hydration water bound to DNA duplexes: direct evidence for a spine of hydration water present in aqueous solution.
422. Szyperski, T., Güntert, P., Stone, S.R. and Wüthrich, K. (1992) *J. Mol. Biol.* **228**, 1193–1205.
Nuclear magnetic resonance solution structure of hirudin(1–51) and comparison with corresponding three-dimensional structures determined using the complete 65-residue hirudin polypeptide chain.
423. Szyperski, T., Güntert, P., Stone, S.R., Tulinsky, A., Bode, W., Huber, R. and Wüthrich, K. (1992) *J. Mol. Biol.* **228**, 1206–1211.
Impact of protein–protein contacts on the conformation of thrombin-bound hirudin studied by comparison with the nuclear magnetic resonance solution structure of hirudin(1–51).
424. Wüthrich, K. (1992) *Nova acta Leopoldina NF* **60**, Nr. 266, 47–56.
Strukturermittlung an Proteinen und Nukleinsäuren in Lösung mittels NMR.
425. Wüthrich, K. and Gehring, W.J. (1992) in *Transcriptional Regulation* (S.L. McKnight and K.R. Yamamoto, eds.) pp. 535–577, Cold Spring Harbor Laboratory Press, Plainview, NY, USA.
Transcriptional regulation by homeodomain proteins: structural, functional, and genetic aspects.
426. Szyperski, T., Wider, G., Bushweller, J.H. and Wüthrich, K. (1993) *J. Biomol. NMR* **3**, 127–132.
3D ^{13}C – ^{15}N -heteronuclear two-spin coherence spectroscopy for polypeptide backbone assignments in ^{13}C – ^{15}N -double-labeled proteins.
427. Qian, Y.Q., Otting, G. and Wüthrich, K. (1993) *J. Am. Chem. Soc.* **115**, 1189–1190.
NMR detection of hydration water in the intermolecular interface of a protein–DNA complex.
428. Wüthrich, K., Otting, G., Qian, Y.Q., Billeter, M. and Gehring, W. (1992) in *Molecular Structure and Life* (Y. Kyogoku and Y. Nishimura, eds.), pp.115–127, Japan Scientific Societies Press, Tokyo.

Molecular recognition in the homeodomain–DNA system.

429. Güntert, P., Schaefer, N., Otting, G. and Wüthrich, K. (1993) *J. Magn. Reson.* **101**, 103–105.
POMA: A complete *Mathematica* implementation of the NMR product-operator formalism.
430. Leiting, B., de Francesco, R., Tomei, L., Cortese, R., Otting, G. and Wüthrich, K. (1993) *EMBO J.* **12**, 1797–1803.
The three-dimensional NMR-solution structure of the polypeptide fragment 195–286 of the LFB1/HNF1 transcription factor from rat liver comprises a non-classical homeodomain.
431. Brown, L.R., Mronga, S., Bradshaw, R.A., Ortenzi, C., Luporini, P. and Wüthrich, K. (1993) *J. Mol. Biol.* **231**, 800–816.
Nuclear magnetic resonance solution structure of the pheromone Er-10 from the ciliated protozoan *Euplotes raikovi*.
432. Berndt, K.D., Beunink, J., Schröder, W. and Wüthrich, K. (1993) *Biochemistry* **32**, 4564–4570.
Designed replacement of an internal hydration water molecule in BPTI: structural and functional implications of a Gly-to-Ser mutation.
433. Otting, G., Liepinsh, E. and Wüthrich, K. (1993) *Biochemistry* **32**, 3571–3582.
Disulfide bond isomerization in BPTI and BPTI(G36S): an NMR study of correlated mobility in proteins.
434. Szyperski, T., Luginbühl, P., Otting, G., Güntert, P. and Wüthrich, K. (1993) *J. Biomol. NMR* **3**, 151–164.
Protein dynamics studied by rotating frame ^{15}N spin relaxation times.
435. Liepinsh, E., Rink, H., Otting, G. and Wüthrich, K. (1993) *J. Biomol. NMR* **3**, 253–257.
Contribution from hydration of carboxylate groups to the spectrum of water–polypeptide proton–proton Overhauser effects in aqueous solution.
436. Gehring, W.J. and Wüthrich, K. (1993) *Structure* **0**, IV–V .
Structural and functional analysis of homeodomain–DNA interactions.
437. Antuch, W., Berndt, K.D., Chavez, M.A., Delfin, J. and Wüthrich, K. (1993) *Eur. J. Biochem.* **212**, 675–684.
The NMR solution structure of a Kunitz-type proteinase inhibitor from the sea anemone *Stichodactyla helianthus*.
438. O'Connell, J.F., Bougis, P.E. and Wüthrich, K. (1993) *Eur. J. Biochem.* **213**, 891–900.
Determination of the nuclear-magnetic-resonance solution structure of cardiotoxin CTX IIb from *Naja mossambica mossambica*.
439. Wüthrich, K., Güntert, P. and Berndt, K.D. (1993) in *Innovations in Proteases and their Inhibitors* (F.X. Avilés, ed.) pp. 407–424, Walter de Gruyter, Berlin.
Computer-supported NMR structure determination of proteins in solution illustrated with studies of protein proteinase inhibitors.
440. Berndt, K.D., Güntert, P. and Wüthrich, K. (1993) *J. Mol. Biol.* **234**, 735–750.
Nuclear magnetic resonance solution structure of dendrotoxin K from the venom of *Dendroaspis polylepis polylepis*.

441. Qian, Y.Q., Otting, G., Billeter, M., Müller, M., Gehring, W.J. and Wüthrich, K. (1993) *J. Mol. Biol.* **234**, 1070–1083.
Nuclear magnetic resonance spectroscopy of a DNA complex with the uniformly ^{13}C -labeled *Antennapedia* homeodomain and structure determination of the DNA-bound homeodomain.
442. Billeter, M., Qian, Y.Q., Otting, G., Müller, M. Gehring, W. J. and Wüthrich, K. (1993) *J. Mol. Biol.* **234**, 1084–1093.
Determination of the nuclear magnetic resonance solution structure of an *Antennapedia* homeodomain–DNA complex.
443. Billeter, M. and Wüthrich, K. (1993) *J. Mol. Biol.* **234**, 1094–1097.
Model Studies relating nuclear magnetic resonance data with the three-dimensional structure of protein–DNA complexes.
444. Brunne, R.M., Liepinsh, E., Otting, G., Wüthrich, K. and van Gunsteren, W.F. (1993) *J. Mol. Biol.* **231**, 1040–1048.
Hydration of proteins. A comparison of experimental residence times of water molecules solvating the bovine pancreatic trypsin inhibitor with theoretical model calculations.
445. Güntert, P., Berndt, K.D. and Wüthrich, K. (1993) *J. Biomol. NMR* **3**, 601–606.
The program ASNO for computer-supported collection of NOE upper distance constraints as input for protein structure determination.
446. Wider, G. and Wüthrich, K. (1993) *J. Magn. Reson. B* **102**, 239–.
A simple experimental scheme using pulsed field gradients for coherence-pathway rejection and solvent suppression in phase-sensitive heteronuclear correlation spectra.
447. Fede, A., Billeter, M., Leupin, W. and Wüthrich, K. (1993) *Structure* **1**, 177–186.
Determination of the NMR solution structure of the Hoechst 33258– d(GTGGATTCCAC)₂ complex and comparison with the X-ray crystal structure.
448. Szyperski, T., Scheek, S., Johansson, J., Assmann, G., Seedorf, U. and Wüthrich, K. (1993) *FEBS Lett.* **335**, 18–26.
NMR determination of the secondary structure and the three-dimensional polypeptide backbone fold of the human sterol carrier protein 2.
449. Szyperski, T., Wider, G. Bushweller, J.H. and Wüthrich, K. (1993) *J. Am. Chem. Soc.* **115**, 9307–9308.
Reduced dimensionality in triple-resonance NMR experiments.
450. Wüthrich, K. (1993) in *Molecular Structures in Biology* (R. Diamond, T.F. Koetzle, K. Prout and J.S. Richardson, eds.) pp. 20–26, Oxford Univ. Press, Oxford.
Biopolymers: an NMR survey.
451. Otting, G., Billeter, M., Wüthrich, K., Roth, H.J., Leumann, C. and Eschenmoser, A. (1993) *Helv. Chim. Acta* **76**, 2701–2756.
Warum Pentose- und nicht Hexose-Nucleinsäuren? ‘Homo-DNS’: ^1H -, ^{13}C -, ^{31}P - und ^{15}N -NMR-spektroskopische Untersuchung von ddGlc(A-A-A-A-T-T-T-T-T) in wässriger Lösung
452. Bushweller, J.H., Holmgren, A. and Wüthrich, K. (1993) *Eur. J. Biochem.* **218**, 327–334.

Biosynthetic ^{15}N and ^{13}C isotope labelling of glutathione in the mixed disulfide with *Escherichia coli* glutaredoxin documented by sequence-specific NMR assignments.

453. Wüthrich, K. (1994) *Current Opinion in Structural Biology* **4**, 93–99.
NMR assignment as a basis for structural characterization of denatured states of globular proteins.
454. Sevilla-Sierra, P., Otting, G. and Wüthrich, K. (1994) *J. Mol. Biol.* **235**, 1003–1020.
Determination of the nuclear magnetic resonance structure of the DNA-binding domain of the *P22 c2* repressor (1 to 76) in solution and comparison with the DNA-binding domain of the 434 repressor.
455. Wüthrich, K. (1993) *Les Cahiers de la Fondation*, Vol. 8, Fondation Louis Jeantet de Médecine, Genève, Suisse.
Three-dimensional protein structures in biological and biomedical research.
456. Bushweller, J.H., Billeter, M., Holmgren, A. and Wüthrich, K. (1994) *J. Mol. Biol.* **235**, 1585–1597.
The nuclear magnetic resonance solution structure of the mixed disulfide between *Escherichia coli* glutaredoxin(C14S) and glutathione.
457. Zahn, R., Spitzfaden, C., Ottiger, M., Wüthrich, K. and Plückthun, A. (1994) *Nature* **368**, 261–265.
Destabilization of the complete protein secondary structure on binding to the chaperone GroEL.
458. O'Connell, J.F., Bender, R., Engels, J.W., Koller, K.P., Scharf, M. and Wüthrich, K. (1994) *Eur. J. Biochem.* **220**, 763–770.
The nuclear-magnetic-resonance solution structure of the mutant α -amylase inhibitor [R19L]Tendamistat and comparison with wild-type Tendamistat.
459. Leupin, W., Bur, D., Dorn, A., Ji, Y.H., Labhardt, A., Fede, A., Billeter, M. and Wüthrich, K. (1994) *Actual. Chim. Thér.* **21**, 153–170.
Bis-benzimidazole derivatives as DNA ligands: design based on the solution structure of a Hoechst 33258–DNA complex with subsequent molecular modelling.
460. Wüthrich, K. (1994) in *Toward a Molecular Basis of Alcohol Use and Abuse* (B. Jansson, H. Jörnvall, U. Rydberg, L. Terenius and B.L. Vallee, eds.) pp. 261–268, Birkhäuser Verlag, Basel.
NMR, alcohols, protein solvation and protein denaturation.
461. Qian, Y.Q., Furukubo-Tokunaga, K., Resendez-Perez, D., Müller, M., Gehring, W.J. and Wüthrich K. (1994) *J. Mol. Biol.* **238**, 333–345.
Nuclear magnetic resonance solution structure of the *fushi tarazu* homeodomain from *Drosophila* and comparison with the *Antennapedia* homoeomain.
462. Qian, Y.Q., Resendez-Perez, D., Gehring, W.J. and Wüthrich, K. (1994) *Proc. Natl. Acad. Sci. USA* **91**, 4091–4095.
The *des(1–6)Antennapedia* homeodomain: comparison of the NMR solution structure and the DNA-binding affinity with the intact *Antennapedia* homeodomain.
463. Wüthrich, K. (1993) in *DNA and Chromosomes, Cold Spring Harbor Symposia on Quantitative Biology* **58**, 149–157.

Hydration of biological macromolecules in solution: surface structure and molecular recognition.

464. Johansson, J., Szyperski, T., Curstedt, T. and Wüthrich, K. (1994) *Biochemistry* **33**, 6015–6023.
The NMR structure of the pulmonary surfactant-associated polypeptide SP-C in an apolar solvent contains a valyl-rich α -helix.
465. Wider, G., Dötsch, V. and Wüthrich, K. (1994) *J. Magn. Reson. A* **108**, 255–258.
Self-compensating pulsed magnetic-field gradients for short recovery times.
466. Spitzfaden, C., Braun, W., Wider, G., Widmer, H. and Wüthrich, K. (1994) *J. Biomol. NMR* **4**, 463–482.
Determination of the NMR solution structure of the cyclophilin A–cyclosporin A complex.
467. Szyperski, T., Antuch, W., Schick, M., Betz, A., Stone, S.R. and Wüthrich, K. (1994) *Biochemistry* **33**, 9303–9310.
Transient hydrogen bonds identified on the surface of the NMR solution structure of hirudin.
468. Ottiger, M., Szyperski, T., Luginbühl, L., Ortenzi, C., Luporini, P., Bradshaw, R.A. and Wüthrich, K. (1994) *Protein Science* **3**, 1515–1526.
The NMR solution structure of the pheromone Er-2 from the ciliated protozoan *Euplotes raikovi*.
469. Mronga, S., Luginbühl, P., Brown, L.R., Ortenzi, C., Luporini, P., Bradshaw, R.A. and Wüthrich, K. (1994) *Protein Science* **3**, 1527–1536.
The NMR solution structure of the pheromone Er-1 from the ciliated protozoan *Euplotes raikovi*.
470. Luginbühl, P., Ottiger, M., Mronga, S. and Wüthrich, K. (1994) *Protein Science* **3**, 1537–1546.
Structure comparison of the pheromones Er-1, Er-10, and Er-2 from *Euplotes raikovi*.
471. Antuch, W., Güntert, P., Billeter, M., Hawthorne, T., Grossenbacher, H. and Wüthrich, K. (1994) *FEBS Lett.* **352**, 251–257.
NMR solution structure of the recombinant tick anticoagulant protein (rTAP), a factor XA inhibitor from the tick *Ornithodoros moubata*.
472. Szyperski, T., Pellechia, M., Wall, D., Georgopoulos, C. and Wüthrich, K. (1994) *Proc. Natl. Acad. Sci. USA* **91**, 11343–11347.
NMR structure determination of the *Escherichia coli* DnaJ molecular chaperone: secondary structure and backbone fold of the N-terminal region 2–108 comprising the highly conserved J-domain.
- 473 Gehring, W.J., Qian, Y.Q., Billeter, M., Furukubo-Tokunaga, K., Schier, A. F., Resendez-Perez, D., Affolter, M., Otting, G. and Wüthrich, K. (1994) *Cell*, **78**, 211–223.
Homeodomain–DNA recognition.
474. Dötsch, V., Wider, G. and Wüthrich, K. (1994) *J. Magn. Reson. A* **109**, 263–264.
Phase-sensitive spectra in a single scan with coherence selection by pulsed field gradients.
475. Schiffer, C.A., Huber, R., Wüthrich, K. and van Gunsteren, W.F. (1994) *J. Mol. Biol.* **241**, 588–599.
Simultaneous refinement of the structure of BPTI against NMR data measured in solution and X-ray diffraction data measured in single crystals.

476. Braun, D., Wider, G. and Wüthrich, K. (1994) *J. Am. Chem. Soc.* **116**, 8466–8469.
Sequence-corrected ^{15}N “Random Coil” chemical shifts.
477. Szyperski, T., Pellecchia, M. and Wüthrich, K. (1994) *J. Magn. Reson. B* **105**, 188–191.
3D $\underline{\text{H}}^{\alpha}/\beta\text{C}^{\alpha}/\beta(\text{CO})\text{NHN}$, a projected 4D NMR experiment for sequential correlation of polypeptide $^1\text{H}^{\alpha}/\beta$, $^{13}\text{C}^{\alpha}/\beta$ and backbone ^{15}N and $^1\text{H}^{\text{N}}$ chemical shifts.
478. Bartels, C. and Wüthrich, K. (1994) *J. Biomol. NMR* **4**, 775–785.
A spectral correlation function for efficient sequential NMR assignments of uniformly ^{15}N -labeled proteins.
479. Altschuh, D., Braun, W., Kallen, J., Mikol, V., Spitzfaden, C., Thierry, J.C., Vix, O., Walkinshaw, M.D. and Wüthrich, K. (1994) *Structure* **2**, 963–972.
Conformational polymorphism of cyclosporin A.
480. Smith, P.E., van Schaik, R.C., Szyperski, T., Wüthrich, K. and van Gunsteren, W.F. (1995) *J. Mol. Biol.* **246**, 356–365.
Internal mobility of the basic pancreatic trypsin inhibitor in solution: A comparison of NMR spin relaxation measurements and molecular dynamics simulations.
481. Braun, W., Kallen, J., Mikol, V., Walkinshaw, M.D. and Wüthrich K. (1995) *FASEB Journal* **9**, 63–72.
Three-dimensional structure and actions of immunosuppressants and their immunophilins.
482. Johansson, J., Szyperski, T. and Wüthrich, K. (1995) *FEBS Lett.* **362**, 261–265.
Pulmonary surfactant-associated polypeptide SP-C in lipid micelles: CD studies of intact SP-C and NMR secondary structure determination of depalmitoyl-SP-C(1–17).
483. Wüthrich, K. (1995) *Acta Cryst. D* **51**, 249–270.
NMR—this other method for protein and nucleic acid structure determination.
484. Wüthrich, K. (1995) in *Proc. XIIIth International Symposium on Medical Chemistry* (J.C. Muller, ed.) *Eur. J. Med. Chem.* **30**, 68s–84s.
Structure determination of biological macromolecules by NMR in solution: Impact in biomedical research.
485. Dötsch, V., Wider, G., Siegal, G. and Wüthrich, K. (1995) *FEBS Lett.* **366**, 6–10.
Interaction of urea with an unfolded protein. The DNA-binding domain of the 434-repressor.
486. Wüthrich, K. (1995) *NMR in Structural Biology*, World Scientific, Singapore.
487. Szyperski, T., Braun, D., Fernández, C., Bartels, C. and Wüthrich K. (1995) *J. Magn. Reson. B* **108**, 197–203.
A novel reduced-dimensionality triple-resonance experiment for efficient polypeptide backbone assignment, 3D CO HN N CA.
488. Bartels, C., Xia, T., Billeter, M., Güntert, P. and Wüthrich K. (1995) *J. Biomol. NMR* **6**, 1–10.
The program XEASY for computer-supported NMR spectral analysis of biological macromolecules.

489. Dötsch, V., Wider, G., Siegal, G. and Wüthrich, K. (1995) *FEBS Lett.* **372**, 288–290.
Salt-stabilized globular protein structure in 7M aqueous urea solution.
490. Brunne, R.M., Berndt, K.D., Güntert, P., Wüthrich, K. and van Gunsteren, W.F. (1995) *Proteins* **23**, 49–62.
Structure and internal dynamics of the bovine pancreatic trypsin inhibitor in aqueous solution from long-time molecular dynamics simulations.
491. Luginbühl, P., Szyperski, T. and Wüthrich, K. (1995) *J. Magn. Reson. B* **109**, 229–233.
Statistical basis for the use of $^{13}\text{C}^\alpha$ chemical shifts in protein structure determination.
492. Schiffer, C.A., Dötsch, V., Wüthrich, K. and van Gunsteren, W. (1995) *Biochemistry* **34**, 15057–15067.
Exploring the role of the solvent in the denaturation of a protein: A molecular dynamics study of the DNA binding domain of the 434 repressor.
493. Altmann, S., Labhardt, A.M., Bur, D., Lehmann, C., Bannwarth, W., Billeter, M., Wüthrich, K. and Leupin, W. (1995) *Nucl. Acids Res.* **23**, 4827–4835.
NMR studies of DNA duplexes singly cross-linked by different synthetic linkers.
494. Bartels, C., Güntert, P. and Wüthrich, K. (1995) *J. Magn. Reson. A* **117**, 330–333.
IFLAT – A new automatic baseline-correction method for multidimensional NMR spectra with strong solvent signals.
495. Wüthrich, K. (1996) in *Encyclopedia of Nuclear Magnetic Resonance* (D.M. Grant and R.K. Harris, eds.) Wiley, New York, Vol. **1**, pp. 710–719.
NMR structures of biological macromolecules.
496. Wüthrich, K. (1996) in *Encyclopedia of Nuclear Magnetic Resonance* (D.M. Grant and R.K. Harris, eds.) Wiley, New York, Vol. **2**, pp. 932–939.
Biological macromolecules: structure determination in solution.
497. Wüthrich, K. (1996) in *Encyclopedia of Nuclear Magnetic Resonance* (D.M. Grant and R.K. Harris, eds.) Wiley, New York, Vol. **5**, pp. 3449–3455.
Pancreatic trypsin inhibitor.
498. Berndt, K.D., Güntert, P. and Wüthrich, K. (1996) *Proteins* **3**, 304–313.
Conformational sampling by NMR solution structures calculated with the program DIANA evaluated by comparison with long-time molecular dynamics calculations in explicit water.
499. Koradi, R., Billeter, M. and Wüthrich, K. (1996) *J. Mol. Graph.* **14**, 51–55.
MOLMOL: a program for display and analysis of macromolecular structures.
500. Zerbe, O., Szyperski, T., Ottiger, M. and Wüthrich, K. (1996) *J. Biomol. NMR* **7**, 99–106.
Three-dimensional ^1H -TOCSY-relayed ct-[$^{13}\text{C}, ^1\text{H}$]-HMQC for aromatic spin system identification in uniformly ^{13}C labeled proteins.
501. Braun, D., Wider, G. and Wüthrich, K. (1996) *J. Magn. Reson. B* **110**, 313–315.
Monitoring NMR spectrometer performance during data accumulation for macromolecular structure determination.
502. Bartels, C., Billeter, M., Güntert, P. and Wüthrich, K. (1996) *J. Biomol. NMR* **7**, 207–213.

Automated sequence-specific NMR assignment of homologous proteins using the program GARANT.

503. Riek, R., Hornemann, S., Wider, G., Billeter, M., Glockshuber, R. and Wüthrich, K. (1996) *Nature* **382**, 180–182.
NMR structure of the mouse prion protein domain PrP(121–231).
504. Pellecchia, M., Szyperski, T., Wall, D., Georgopoulos, C. and Wüthrich, K. (1996) *J. Mol. Biol.* **260**, 236–250.
NMR structure of the J-domain and the Gly/Phe-rich region of the *Escherichia coli* DnaJ chaperone.
505. Billeter, M., Güntert, P., Luginbühl, P. and Wüthrich, K. (1996) *Cell* **85**, 1057–1065.
Hydration and DNA recognition by homeodomains.
506. Kupce, E., Freeman, R., Wider, G. and Wüthrich, K. (1996) *J. Magn. Reson. A* **120**, 264–268.
Figure of merit and cycling sidebands in adiabatic decoupling.
507. Antuch, W., Güntert, P. and Wüthrich, K. (1996) *Nature Struct. Biol.* **3**, 662–665.
Ancestral $\beta\gamma$ -crystallin precursor structure in a yeast killer toxin.
508. Luginbühl, P., Wu, J., Zerbe, O., Ortenzi, C., Luporini, P. and Wüthrich, K. (1996) *Protein Science* **5**, 1512–1522.
The NMR solution structure of the pheromone Er-11 from the ciliated protozoan *Euplotes raikovi*.
509. Glockshuber, R., Hornemann, S., Riek, R., Billeter, M., Wider, G. and Wüthrich, K. (1996) *Spektrum der Wissenschaften* **9**, 16–18.
Dreidimensionale Struktur einer Domäne des zellulären Prion-Proteins aufgeklärt.
510. Szypersky, T., Bailey, J.E. and Wüthrich, K. (1996) *Trends Biotechn.* **14**, 453–459.
Detecting and dissecting metabolic fluxes using biosynthetic fractional ^{13}C -labeling and two-dimensional NMR spectroscopy.
511. Szyperski, T., Braun, D., Banecki, B. and Wüthrich, K. (1996) *J. Am. Chem. Soc.* **118**, 8146–8147.
Useful information from axial peak magnetization in projected NMR experiments.
512. Wüthrich, K. (1996) in *Molecular Manufacturing, EL.B.A. Forum Series, Vol. 2* (C. Nicolini and S. Vakula, eds.) pp. 115–130, Plenum Press, New York.
NMR structure determination and rational drug design.
513. Kupce, E., Freeman, R., Wider, G. and Wüthrich, K. (1996) *J. Magn. Reson. A* **122**, 81–84.
Suppression of cycling sidebands using bi-level adiabatic decoupling.
514. Luginbühl, P., Güntert, P., Billeter, M. and Wüthrich, K. (1996) *J. Biomol. NMR* **8**, 136–146.
The new program OPAL for molecular dynamics simulations and energy refinements of biological macromolecules.
515. Wider, G., Riek R. and Wüthrich, K. (1996) *J. Am. Chem. Soc.* **118**, 11629–11634.
Diffusion filters for separation of solvent–protein and protein–protein nuclear Overhauser effects (HYDRA).
516. Pervushin, K., Billeter, M., Siegal, G. and Wüthrich, K. (1996) *J. Mol. Biol.* **264**, 1002–1012.

Structural role of a buried salt bridge in the 434 repressor DNA-binding domain.

517. Bartels, C., Güntert, P., Billeter, M. and Wüthrich, K. (1997) *J. Comp. Chem.* **18**, 139–149.
GARANT – a general algorithm for resonance assignment of multidimensional nuclear magnetic resonance spectra.
518. Pellecchia, M., Iwai, H., Szyperski, T. and Wüthrich, K. (1997) *J. Magn. Reson.* **124**, 274–278.
The 2D NMR experiments $\text{H}(\text{C})\text{CO}_2$ and HCCO_2 for assignment and pH titration of carboxylate groups in uniformly $^{15}\text{N}/^{13}\text{C}$ -labeled proteins.
519. Wüthrich, K. (1997) *Chimia* **51**, 16–17.
Structural insight into prion diseases.
520. Fernández ,C., Szyperski, T., Bruyère, T., Ramage, P., Mössinger, E. and Wüthrich, K. (1997) *J. Mol. Biol.* **266**, 576–593.
NMR solution structure of the pathogenesis-related protein P14a.
521. Wüthrich, K., Billeter, M., Güntert, P., Luginbühl, P., Riek, R. and Wider, G. (1996) *Faraday Discuss.* **103**, 245–253.
NMR studies of the hydration of biological macromolecules.
522. Schott, O., Billeter, M., Leiting, B., Wider, G. and Wüthrich, K. (1997) *J. Mol. Biol.* **267**, 673–683.
The NMR solution structure of the non-classical homeodomain from the rat liver LFB1/HNF1 transcription factor.
523. Sauer, U., Hatzimanikatis, V., Bailey, J.E., Hochuli, M., Szyperski, T. and Wüthrich, K. (1997) *Nature Biotech.* **15**, 448–452.
Metabolic fluxes in riboflavin-producing *Bacillus subtilis*.
524. Pervushin, K., Wider, G. and Wüthrich, K. (1997) *J. Am. Chem. Soc.* **119**, 3842–3843.
Deuterium relaxation in a uniformly ^{15}N -labeled homeodomain and its DNA complex.
525. Luginbühl, P., Pervushin, K.V., Iwai, H. and Wüthrich, K. (1997) *Biochemistry* **36**, 7305–7312.
Anisotropic molecular rotational diffusion in ^{15}N spin relaxation studies of protein mobility.
526. Wüthrich, K. (1996) *Proc. Natl. Acad. Sci. India* **66**, 1–8.
NMR for physicochemical characterization of proteins.
527. Wüthrich, K. (1997) in *Röntgen Centennial: X-rays in Natural and Life Sciences* (A. Haase, G. Landwehr and E. Umbach, eds.) pp. 242–257, World Scientific, Singapore.
NMR – an alternative to x-ray crystallography for protein and nucleic acid structure determination.
528. King, C.Y., Trittmann, P., Gross, H., Gebert, R., Aeby, M. and Wüthrich, K. (1997) *Proc. Natl. Acad. Sci. USA* **94**, 6618–6622.
Prion-inducing domain 2–114 of yeast Sup35 protein transforms *in vitro* into amyloid-like filaments.
529. Billeter, M., Riek, R., Wider, G., Hornemann, S., Glockshuber, R. and Wüthrich, K. (1997) *Proc. Natl. Acad. Sci. USA* **94**, 7281–7285.

Prion protein NMR structure and species barrier for prion diseases.

530. Glockshuber, R., Hornemann S., Riek, R., Wider, G., Billeter, M. and Wüthrich, K. (1997) *Trends Biochem. Sci.* **22**, 241–242.
Three-dimensional NMR structure of a self-folding domain of the prion protein PrP(121–231).
531. Altmann, S., Labhardt, A.M., Senn, H. and Wüthrich, K. (1997) *J. Biomol. NMR* **9**, 445–446.
Sequence-specific ¹H, ¹³C and ¹⁵N assignment of the TMP-resistant dihydrofolate reductase mutant DHFR(F98Y) in the ternary complex with TMP and NADPH.
532. Hornemann, S., Korth, C., Oesch, B., Riek, R., Wider, G., Wüthrich, K. and Glockshuber, R. (1997) *FEBS Lett.* **413**, 277–281.
Recombinant full-length murine prion protein, *m*PrP(23–231): purification and spectroscopic characterization.
533. Riek, R., Hornemann, S., Wider, G., Glockshuber, R. and Wüthrich, K. (1997) *FEBS Lett.* **413**, 282–288.
NMR characterization of the full length recombinant murine prion protein, *m*PrP(23–231).
534. Nieba-Axmann, S. E., Ottiger, M., Wüthrich, K. and Plückthun, A. (1997) *J. Mol. Biol.* **271**, 803–818.
Multiple cycles of global unfolding of GroEL-bound cyclophilin A evidenced by NMR.
535. Ottiger, M., Zerbe, O., Güntert, P. and Wüthrich, K. (1997) *J. Mol. Biol.* **272**, 64–81.
The NMR solution conformation of unligated human cyclophilin A.
536. Güntert, P., Mumenthaler, C. and Wüthrich, K. (1997) *J. Mol. Biol.* **273**, 283–298.
Torsion angle dynamics for NMR structure calculation with the new program DYANA.
537. Pellecchia, M., Wider, G., Iwai, H. and Wüthrich, K. (1997) *J. Biomol. NMR* **10**, 193–197.
Arginine side chain assignments in uniformly ¹⁵N-labeled proteins using the novel 2D HE(NE)HH experiment.
538. Klimasauskas, S., Szyperski, T., Serva, S. and Wüthrich, K. (1998) *EMBO J.* **17**, 317–324.
Dynamic modes of the flipped-out cytosine during *Hha*I methyltransferase–DNA interactions in solution.
539. Pervushin, K., Riek, R., Wider, G. and Wüthrich, K. (1997) *Proc. Natl. Acad. Sci. USA* **94**, 12366–12371.
Attenuated T_2 relaxation by mutual cancellation of dipole–dipole coupling and chemical shift anisotropy indicates an avenue to NMR structures of very large biological macromolecules in solution.
540. Korth, C., Stierli, E., Streit, P., Moser, M., Schaller, O., Fischer, R., Schulz-Schaeffer, W., Kretschmar, H., Raeber, A., Braun, U., Ehrenspurger, F., Hornemann, S., Glockshuber, R., Riek, R., Billeter, M., Wüthrich, K. and Oesch, B. (1997) *Nature* **390**, 74–77.
Prion (PrP^{Sc})-specific epitope defined by a monoclonal antibody.
541. Szyperski, T., Ono A., Fernández C., Iwai H., Tate, S., Wüthrich, K. and Kainosho, M. (1997) *J. Am. Chem. Soc.* **119**, 9901–9902.
Measurement of ${}^3J_{\text{C}_2\text{P}}$ scalar couplings in a 17 kDa protein complex with ¹³C, ¹⁵N-labeled DNA distinguishes the B_I and B_{II} phosphate conformations of the DNA.

542. Zahn, R., von Schroetter C. and Wüthrich, K. (1997) *FEBS Lett.* **417**, 400–404.
Human prion proteins expressed in *Escherichia coli* and purified by high-affinity column refolding.
543. Szyperski, T., Féرنandez C. and Wüthrich K. (1997) *J. Magn. Reson.* **128**, 228–232.
Two-Dimensional ct-HC(C)H-COSY for resonance assignments of smaller ¹³C-labeled biomolecules.
544. Mumenthaler, C., Güntert, P., Braun, W. and Wüthrich, K. (1997) *J. Biomol. NMR* **10**, 351–362.
Automated combined assignment of NOESY spectra and three-dimensional protein structure determination.
545. Glockshuber, R., Hornemann, S., Billeter, M., Riek, R., Wider, G., and Wüthrich, K. (1998) *FEBS Lett.* **426**, 291–296.
Prion protein structural features indicate possible relations to signal peptidases.
546. Szyperski, T., Féرنandez, C., Ono, A., Kainosho, M. and Wüthrich, K. (1998) *J. Am. Chem. Soc.* **120**, 821–822.
Measurement of deoxyribose ³J_{HH} scalar couplings reveals protein binding-induced changes in the sugar puckles of the DNA.
547. Szyperski, T., Féرنandez, C., Mumenthaler, C. and Wüthrich, K. (1998) *Proc. Natl. Acad. Sci. USA* **95**, 2262–2266.
Structure comparison of human glioma pathogenesis-related protein GliPR and the plant pathogenesis-related protein P14a indicates a functional link between the human immune system and a plant defense system.
548. Sobol, A. G., Wider, G., Iwai, H. and Wüthrich, K. (1998) *J. Magn. Reson.* **130**, 262–271.
Solvent magnetization artifacts in high-field NMR studies of macromolecular hydration.
549. Pellecchia, M., Güntert, P., Glockshuber, R. and Wüthrich, K. (1998) *J. Biomol. NMR* **11**, 229–230.
Sequence-specific ¹H, ¹⁵N and ¹³C assignments of the periplasmic chaperone FimC from *Escherichia coli*.
550. Pervushin, K., Riek, R., Wider, G. and Wüthrich, K. (1998) *J. Am. Chem. Soc.* **120**, 6394–6400.
Transverse relaxation-optimized spectroscopy (TROSY) for NMR studies of aromatic spin systems in ¹³C-labeled proteins.
551. Wüthrich, K. (1998) *Nature Struct. Biol.* **5**, 492–495.
The second decade – into the third millenium.
552. Markley, J. L., Bax, A., Arata, Y., Hilbers, C. W., Kaptein, R., Sykes, B. D., Wright, P. E. and Wüthrich, K. (1998) *Pure Appl. Chem.* **70**, 117–142; reprinted: (1998) *J. Biomol NMR*, **12**, 1–23; (1998) *J. Mol. Biol.* **280**, 933–952.
Recommendations for the presentation of NMR structures of proteins and nucleic acids.
553. Glockshuber, R., Hornemann, S., Riek, R., Wider, G., Billeter, M. and Wüthrich, K. (1998) in *NATO ASI Series A: Life Sciences* (D. R. O. Morrison, ed.) vol. **295**, pp. 203–216.
Autonomous folding and three-dimensional structure of the carboxy-terminal domain of the mouse prion protein, PrP(121–231).

554. Weber, F. E., Dyer, J. H., Lopez Garcia, F., Werder, M., Szyperski, T., Wüthrich, K. and Hauser, H. (1998) *Cell. Mol. Life Sci.* **54**, 751–759.
In pre-sterol carrier protein 2 (SCP2) in solution the leader peptide 1–20 is flexibly disordered, and residues 21–143 adopt the same globular fold as in mature SCP2.
555. Pervushin, K. V., Wider, G. and Wüthrich, K. (1998) *J. Biomol. NMR* **12**, 345–348.
Single transition-to-single transition polarization transfer (ST2-PT) in [¹⁵N,¹H]-TROSY.
556. Fernández C., Szyperski, T., Ono, A., Iwai, H., Tate, S., Kainosho, M. and Wüthrich, K. (1998) *J. Biomol. NMR* **12**, 25–37.
NMR with ¹³C,¹⁵N-doubly-labeled DNA: The *Antennapedia* homeodomain complex with a 14-mer DNA duplex.
557. Pellechia, M., Güntert, P., Glockshuber R. and Wüthrich, K. (1998) *Nature Struct. Biol.* **5**, 10, 885–890.
NMR solution structure of the periplasmic chaperone FimC.
558. Riek, R., Wider, G., Billeter, M., Hornemann, S., Glockshuber R. and Wüthrich K. (1998) *Proc. Natl. Acad. Sci. USA* **95**, 11667–11672.
Prion protein NMR structure and familial human spongiform encephalopathies.
559. Salzmann, M., Pervushin, K., Wider, G., Senn, H. and Wüthrich, K. (1998) *Proc. Natl. Acad. Sci. USA* **95**, 13585–13590
TROSY in triple-resonance experiments: new perspectives for sequential NMR assignment of large proteins.
560. Banci, L., Bertini, I., Cremonini, M.A., Gori-Savellini, G., Luchinat, C., Wüthrich, K. and Güntert, P. (1998) *J. Biomol. NMR* **12**, 553–557.
PSEUDYANA for NMR structure calculation of paramagnetic metalloproteins using torsion angle molecular dynamics.
561. Güntert, P., Billeter, M., Ohlenschläger, O., Brown, L.R. and Wüthrich, K. (1998) *J. Biomol. NMR* **12**, 543–548.
Conformational analysis of protein and nucleic acid fragments with the new grid search algorithm FOUND.
562. Glockshuber, R., Hornemann, S., Riek, R., Billeter, M., Wider, G., Liemann, S., Zahn, R. and Wüthrich, K. (1998) in *PRIONS - Molecular and Cellular Biology* (D. A. Harris, ed.) Horizon Scientific Press, pp. 1–25.
Folding and three-dimensional NMR structure of the recombinant cellular prion protein from the mouse.
563. Pervushin, K., Ono, A., Fernandez, C., Szyperski, T., Kainosho, M. and Wüthrich, K. (1998) *Proc. Natl. Acad. Sci. USA* **95**, 14147–14151.
NMR scalar couplings across Watson–Crick base pair hydrogen bonds in DNA observed by transverse relaxation-optimized spectroscopy.
564. Koradi, R., Billeter, M., Engeli, M., Güntert, P., and Wüthrich, K. (1998) *J. Magn. Reson.* **135**, 288–297.
Automated peak picking and peak integration in macromolecular NMR spectra using AUTOPSY.

565. Szyperski, T., Vandenbussche, G., Curstedt, T., Ruysschaert, J.-M., Wüthrich, K. and Johansson J. (1998) *Protein Science* **7**, 2533–2540.
 Pulmonary surfactant-associated polypeptide C in a mixed organic solvent transforms from a monomeric α -helical state into insoluble β -sheet aggregates.
566. Salzmann, M., Wider, G., Pervushin, K., Senn, H. and Wüthrich, K. (1999) *J. Am. Chem. Soc.* **121**, 844–848.
 TROSY-type triple resonance experiments for sequential NMR assignments of large proteins.
567. Fiaux, J., Andersson, Ch.I.J., Holmberg, N., Bülow, L., Kallio, P.T., Szypersky, T., Bailey, J.E. and Wüthrich, K. (1999) *J. Am. Chem. Soc.* **121**, 1407–1408.
 ^{13}C NMR flux ratio analysis of *Escherichia coli* central carbon metabolism in microaerobic bioprocesses.
568. Pellecchia, M., Sebbel, P., Hermanns, U., Wüthrich, K. and Glockshuber, R. (1999) *Nature Struct. Biol.* **6**, 336–339.
 Pilus chaperone FimC–adhesin FimH interactions mapped by TROSY-NMR.
569. Fattorusso, R., Pellecchia, M., Viti, F., Neri, P., Neri, D. and Wüthrich, K. (1999) *Structure with Folding and Design* **7**, 381–390.
 NMR structure of the human oncofoetal fibronectin ED-B domain, a specific marker for angiogenesis.
570. Szyperski, T., Götte, M., Billeter, M., Perola, E., Cellai, L., Heumann, H. and Wüthrich, K. (1999) *J. Biomol. NMR* **13**, 343–355.
 NMR structure of the chimeric hybrid duplex r(gcaguggc)•r(gcca)d(CTGC) comprising the tRNA-DNA junction formed during initiation of HIV-1 reverse transcription.
571. Riek, R., Wider, G., Pervushin, K. and Wüthrich, K. (1999) *Proc. Natl. Acad. Sci. USA* **96**, 4918–4923.
 Polarization transfer by cross-correlated relaxation in solution NMR with very large molecules.
572. Hochuli, M., Patzelt, H., Oesterhelt, D., Wüthrich, K. and Szyperski, T. (1999) *J. Bacteriol.* **181**, 3226–3237.
 Amino acid biosynthesis in the halophilic archaeon *Haloarcula hispanica*.
573. Matthey, U., Kaim, G., Braun, D., Wüthrich, K. and Dimroth, P. (1999) *Eur. J. Biochem.* **261**, 459–467.
 NMR studies of subunit c of the ATP synthase from *Propionigenium modestum* in dodecylsulphate micelles.
574. Salzmann, M., Pervushin, K., Wider, G., Senn, H. and Wüthrich, K. (1999) *J. Biomol. NMR* **14**, 85–88.
 $[^{13}\text{C}]$ -constant-time $[^{15}\text{N}, ^1\text{H}]$ -TROSY-HNCA for sequential assignments of large proteins.
575. Wüthrich, K., Billeter, M., Riek, R., Wider, G., Hornemann, S. and Glockshuber, R. (1999) in *Peptide Science - Present and Future* (Y. Shimonishi, ed.) pp. 330–334, Kluwer, Dordrecht.
 Prion protein structure and pathology of transmissible spongiform encephalopathies (TSE).
576. Liu, A., Riek, R., Zahn, R., Hornemann, S., Glockshuber, R. and Wüthrich, K. (1999) *Biopolymers Peptide Sci.* **51**, 145–152.

Peptides and proteins in neurodegenerative disease: helix propensity of a polypeptide containing helix 1 of the mouse prion protein studied by NMR and CD spectroscopy.

577. Wimmer, R., Herrmann, T., Solioz, M. and Wüthrich, K. (1999) *J. Biol. Chem.* **274**, 22597–22603.
NMR structure and metal interactions of the CopZ copper chaperone.
578. Pervushin, K.V., Wider, G., Riek, R. and Wüthrich, K. (1999) *Proc. Natl. Acad. Sci. USA* **96**, 9607–9612.
The 3D NOESY-[¹H,¹⁵N,¹H]-ZQ-TROSY NMR experiment with diagonal peak suppression.
579. Riek, R., Prêcheur, B., Wang, Y., Mackay, E.A., Wider, G., Güntert, P., Liu, A., Kägi J.H.R. and Wüthrich, K. (1999) *J. Mol. Biol.* **291**, 417–428.
NMR structure of the sea urchin (*Strongylocentrotus purpuratus*) metallothionein MTA.
580. Fernández, C., Szyperski, T., Billeter, M., Ono, A., Iwai, H., Kainosho, M. and Wüthrich, K. (1999) *J. Mol. Biol.* **292**, 609–617.
Conformational changes of the BS2 operator DNA upon complex formation with the *Antennapedia* homeodomain studied by NMR with ¹³C/¹⁵N-labeled DNA.
581. Wider, G. und Wüthrich, K. (1999) *Curr. Opin. Struct. Biol.* **9**, 594–601.
NMR spectroscopy of large molecules and multimolecular assemblies in solution.
582. Wüthrich, K. (1999) in *Biological Physics, AIP Conf. Proc.* **487**, 3–7.
Hydration of proteins, nucleic acids and protein–DNA complexes in solution.
583. Szyperski, T., Fernandéz, C., Ono, A., Wüthrich, K. and Kainosho, M. (1999) *J. Magn. Reson.* **140**, 491–494.
The 2D {³¹P} spin-echo-difference constant-time [¹³C,¹H]-HMQC experiment for simultaneous determination of ³J_{H3'P} and ³J_{C4'P} in ¹³C-labeled nucleic acids and their protein complexes.
584. Szyperski, T., Glaser, R.W., Hochuli, M., Fiaux, J., Sauer, U., Bailey, J.E. and Wüthrich, K. (1999) *Metabolic Eng.* **1**, 189–197.
Bioreaction network topology and metabolic flux ratio analysis by biosynthetic fractional ¹³C labeling and two-dimensional NMR spectroscopy.
585. Sauer, U., Lasko, D.R., Fiaux, J., Hochuli, M., Glaser, R., Szyperski, T., Wüthrich, K. and Bailey, J.E. (1999) *J. Bacteriol.* **181**, 6679–6688.
Metabolic Flux Ratio (METAFoR) analysis of genetic and environmental modulations of *Escherichia coli* central carbon metabolism.
586. Salzmann, M., Wider, G., Pervushin, K. and Wüthrich, K. (1999) *J. Biomol. NMR* **15**, 181–184.
Improved sensitivity and coherence selection for [¹⁵N,¹H]-TROSY elements in triple resonance experiments.
587. Wüthrich, K. (1999) in *Hydration Processes in Biology* (M.C. Bellissent-Funel, ed.) pp. 251–258, IOS Press, Amsterdam.
NMR structure determination of biological macromolecules and studies of hydration in solution.
588. Zahn, R., Liu, A., Lührs, T., Riek, R., von Schroetter, C., López Garcia, F., Billeter, M., Calzolai, L., Wider, G. and Wüthrich, K. (2000) *Proc. Natl. Acad. Sci. USA* **97**, 145–150.
NMR solution structure of the human prion protein.

589. Pervushin, K., Fernández, C., Riek, R., Ono, A., Kainosho, M. and Wüthrich, K. (2000) *J. Biomol. NMR* **16**, 39–46.
Determination of $^{h_2}J_{NN}$ and $^{h_1}J_{HN}$ coupling constants across Watson–Crick base pairs in the *Antennapedia* homeodomain–DNA complex using TROSY.
590. López García, F., Szyperski, T., Dyer, J.H., Choinowski, T., Seedorf, U., Hauser, H. and Wüthrich, K. (2000) *J. Mol. Biol.* **295**, 595–603.
NMR structure of the sterol carrier protein-2: implications for the biological role.
591. Liu A., Riek, R., Wider, G., von Schroetter, C., Zahn, R. and Wüthrich, K. (2000) *J. Biomol. NMR* **16**, 127–138.
NMR experiments for resonance assignments of ^{13}C , ^{15}N doubly-labeled flexible polypeptides: Application to the human prion protein hPrP(23–230).
592. Wüthrich, K. (2000) *Nature Struct. Biol.* **7**, 188–189.
Protein recognition by NMR.
593. Damberger, F., Nikonova, L., Horst, R., Peng, G., Leal, W. S. and Wüthrich, K. (2000) *Protein Sci.* **9**, 1038–1041.
NMR characterization of a pH-dependent equilibrium between two folded solution conformations of the pheromone-binding protein from *Bombyx mori*.
594. Hochuli, M., Szyperski, T. and Wüthrich, K. (2000) *J. Biomol. NMR* **17**, 33–42.
Deuterium isotope effects on the central carbon metabolism of *Escherichia coli* cells grown on a D₂O-containing minimal medium.
595. Wüthrich, K. (1999) in *Kyoto Prizes & Inamori Grants 1998*, pp. 104–141, The Inamori Foundation, Kyoto, Japan.
From Nature to Natural Science.
596. Lopez García, F., Zahn, R., Riek, R. and Wüthrich, K. (2000) *Proc. Natl. Acad. Sci. USA* **97**, 8334–8399.
NMR structure of the bovine prion protein.
597. Calzolai, L., Lysek, D.A., Güntert, P., von Schroetter, C., Riek, R., Zahn, R. and Wüthrich, K. (2000) *Proc. Natl. Acad. Sci. USA* **97**, 8340–8345.
NMR structures of three single-residue variants of the human prion protein.
598. Pervushin, K., Braun, D., Fernández C. and Wüthrich, K. (2000) *J. Biomol. NMR* **17**, 195–202.
[^{15}N , ^1H]/[^{13}C , ^1H]-TROSY for simultaneous detection of backbone ^{15}N – ^1H , aromatic ^{13}C – ^1H and side-chain ^{15}N – $^1\text{H}_2$ correlations in large proteins.
599. Salzmann, M., Pervushin, K., Wider, G., Senn, H. and Wüthrich, K. (2000) *J. Am. Chem. Soc.* **122**, 7543–7548.
NMR assignment and secondary structure determination of an octameric 110 kDa protein using TROSY in triple resonance experiments.
600. Riek, R., Pervushin, K. and Wüthrich, K. (2000) *Trends Biochem. Sci.* **25**, 462–468.
TROSY and CRINEPT: NMR with large molecular and supramolecular structures in solution.
601. Güntert, P., Salzmann, M., Braun, D. and Wüthrich, K. (2000) *J. Biomol. NMR* **18**, 129 – 137.

Sequence-specific NMR assignment of proteins by global fragment mapping with the program MAPPER.

602. Billeter, M. and Wüthrich, K. (2000) *Arch. Virol. (Suppl.)* **16**, 251 – 263.
The prion protein globular domain and disease-related mutants studied by molecular dynamics simulations.
603. Ellgaard, L., Riek, R., Braun, D., Herrmann, T., Helenius, A. and Wüthrich, K. (2001) *FEBS Lett.* **488**, 69–73.
Three-dimensional structure topology of the calreticulin P-domain based on NMR assignment.
604. Liu, A., Luginbühl, P., Zerbe, O., Ortenzi, C., Luporini, P. and Wüthrich, K. (2001) *J. Biomol. NMR* **19**, 75 – 78.
NMR structure of the pheromone Er-22 from *Euplotes raikovi*.
605. Horst, R., Damberger, F., Peng, G., Nikonova, L., Leal, W.S. and Wüthrich, K. (2001) *J. Biomol. NMR* **19**, 79 – 80.
NMR assignment of the A form of the pheromone-binding protein of *Bombyx mori*.
606. Riek, R., Pervushin, K., Fernández, C., Kainosho, M. and Wüthrich, K. (2001) *J. Am. Chem. Soc.* **123**, 658–664.
[¹³C, ¹³C]- and [¹³C, ¹H]-TROSY in a triple resonance experiment for ribose–base and intrabase correlations in nucleic acids.
607. Frey, A.D., Fiaux, J., Szypersky, T., Wüthrich, K., Bailey, J.E. and Kallio, P.T. (2001) *Appl. Environm. Microbiol.* **67**, 680 – 687.
Dissection of central carbon metabolism of hemoglobin-expressing *Escherichia coli* by ¹³C nuclear magnetic resonance flux distribution analysis in microaerobic bioprocesses.
608. Fernández, C., Adeishvili, K. and Wüthrich, K. (2001) *Proc. Natl. Acad. Sci. USA* **98**, 2358–2363.
Transverse relaxation-optimized NMR spectroscopy with the outer membrane protein OmpX in dihexanoyl phosphatidylcholine micelles.
609. Ellgaard, L., Riek, R., Herrmann, T., Güntert, P., Braun, D., Helenius, A. and Wüthrich, K. (2001) *Proc. Natl. Acad. Sci. USA* **98**, 3133–3138.
NMR structure of the calreticulin P-domain.
610. Wüthrich, K. (2001) in *Prionen und Prionenkrankheiten* (B. Hörlmann, D. Riesner und H. Kretschmar, Hrsg.) pp. 69–73, de Gruyter, Berlin.
Die Bestimmung der dreidimensionalen Struktur des zellulären Prion-Proteins PrP^C.
611. Wüthrich, K. and Riek, R. (2001) *Adv. Protein Chem.* **57**, 55–82.
Three-dimensional structures of prion proteins.
612. Wüthrich, K. (2001) in *International Tables for Crystallography*, Vol. F: (M.G. Rossmann and E. Arnold, eds.) pp. 464–467, Kluwer, Dordrecht, The Netherlands.
Nuclear magnetic resonance (NMR) spectroscopy.
613. Güntert, P. and Wüthrich, K. (2001) *Comp. Phys. Commun.* **138**, 155–169.
Sampling of conformation space in torsion angle dynamics calculations.

614. Fernández, C., Hilty, C., Bonjour, S., Adeishvili, K., Pervushin, K. and Wüthrich, K. (2001) *FEBS Lett.* **504**, 173–178.
Solution NMR studies of the integral membrane proteins OmpX and OmpA from *Escherichia coli*.
615. Wüthrich, K. (2001) in *Encyclopedia of Life Sciences*, online at www.els.net..
Nuclear magnetic resonance (NMR) spectroscopy of proteins.
616. Wüthrich, K. (2001) *Nature Struct. Biol.* **8**, 923–925.
The way to NMR structures of proteins.
617. Horst, R., Damberger, F., Luginbühl, P., Güntert, P., Peng, G., Nikanova, L., Leal, W. S. and Wüthrich, K. (2001) *Proc. Natl. Acad. Sci. USA* **98**, 14374–14379.
NMR structure reveals intramolecular regulation mechanism for pheromone binding and release.
618. Riek, R., Güntert, P., Döbeli, H., Wipf, B. and Wüthrich, K. (2001) *Eur. J. Biochem.* **268**, 5930–5936.
NMR studies in aqueous solution fail to identify significant conformational differences between the monomeric forms of two Alzheimer peptides with widely different plaque-competence, A β (1–40)^{ox} and A β (1–42)^{ox}.
619. Zahn, R., Damberger, F., Ortenzi, C., Luporini, P. and Wüthrich, K. (2001) *J. Mol. Biol.* **313**, 923–931.
NMR structure of the *Euploites raikovi* pheromone Er-23 and identification of its five disulfide bonds.
620. Di Giuseppe, G., Miceli, C., Zahn, R., Damberger, F., Wüthrich, K. and Luporini, P. (2002) *J. Eukaryot. Microbiol.* **49**, 86–92.
A structurally deviant member of the *Euploites raikovi* pheromone family: Er-23.
621. Emmerling, M., Dauner, M., Ponti, A., Fiaux, J., Hochuli, M., Szyperski, T., Wüthrich, K., Bailey, J.E. and Sauer, U. (2002) *J. Bacteriol.* **184**, 152–164.
Metabolic flux responses to pyruvate kinase knockout in *Escherichia coli*.
622. Pellecchia, M., Sem, D. S. and Wüthrich, K. (2002) *Nature Rev. Drug Disc.* **1**, 211–219.
NMR in drug discovery.
623. Frickel, E.M., Riek, R., Jelesarov, I., Helenius, A., Wüthrich, K. and Ellgaard, L. (2002) *Proc. Natl. Acad. Sci. USA* **99**, 1954–1959.
TROSY-NMR reveals interaction between ERp57 and the tip of the calreticulin P-domain.
624. Dauner, M., Sonderegger, M., Hochuli, M., Szyperski, T., Wüthrich, K., Hohmann, H.P., Sauer, U. and Bailey, J.E. (2002) *Appl. Env. Microbiol.* **68**, 1760–1771.
Intracellular carbon fluxes in riboflavin-producing *Bacillus subtilis* during growth on two-carbon substrate mixtures.
625. Luginbühl, P. and Wüthrich, K. (2002) *Progr. Nucl. Magn. Reson. Spect.* **40**, 199–247.
Semi-classical nuclear spin relaxation theory revisited for use with biological macromolecules.
626. Herrmann, T., Güntert, P. and Wüthrich, K. (2002) *J. Mol. Biol.* **319**, 209–227.
Protein NMR structure determination with automated NOE assignment using the new software CANDID and the torsion angle dynamics algorithm DYANA.

627. Etezady-Esfarjani, T., Hilty, C., Wüthrich, K., Rueping, M., Schreiber, J. and Seebach, D. (2002) *Helv. Chim. Acta* **85**, 1197–1209.
NMR-structural investigations of a β 3-dodecapeptide with proteinogenic side chains in methanol and in aqueous solutions.
628. Fiaux, J., Bertelsen, E., Horwich, A. and Wüthrich, K. (2002) *Nature* **418**, 207–211.
NMR analysis of a 900K GroEL–GroES complex.
629. Wüthrich, K. and Wider, G. (2002) in *Encyclopedia of Nuclear Magnetic Resonance* (D.M. Grant and R.K. Harris, eds.), Vol. **9**, pp. 468–477, Wiley, New York.
Transverse relaxation-optimized NMR spectroscopy with biomacromolecular structures in solution.
630. Ellgaard, L., Bettendorff, P., Braun, D., Herrmann, T., Fiorito, F., Jelesarov, I., Güntert, P., Helenius, A. and Wüthrich, K. (2002) *J. Mol. Biol.* **322**, 773–784.
NMR structures of 36- and 73-residue fragments of the calreticulin P-domain.
631. Hilty, C., Fernández, C., Wider, G. and Wüthrich, K. (2002) *J. Biomol. NMR* **23**, 289–301.
Side chain NMR assignments in the membrane protein OmpX reconstituted in DHPC micelles.
632. Riek, R., Fiaux, J., Bertelsen, E., Horwich, A. and Wüthrich, K. (2002) *J. Am. Chem. Soc.* **124**, 12144–12153.
Solution NMR techniques for large molecular and supramolecular structures.
633. Fernández, C., Hilty, C., Wider, G. and Wüthrich, K. (2002) *Proc. Natl. Acad. Sci. USA* **99**, 13533–13537.
Lipid–protein interactions in DHPC micelles containing the integral membrane protein OmpX investigated by NMR spectroscopy.
634. Lee, D., Damberger, F., Peng, G., Horst, R., Güntert, P., Nikonova, L., Leal, W. and Wüthrich, K. (2002) *FEBS Lett.* **531**, 314–318.
NMR structure of the unliganded *Bombyx mori* pheromone-binding protein at physiological pH.
635. Herrmann, T., Güntert, P. and Wüthrich, K. (2002) *J. Biomol. NMR* **24**, 171–189.
Protein NMR structure determination with automated NOE-identification in the NOESY spectra using the new software ATNOS.
636. Fiaux, J., Cakar, Z.P., Sonderegger, M., Wüthrich, K., Szyperski, T. and Sauer, U. (2003) *Eukaryotic Cell* **2**, 170–180.
Metabolic-flux profiling of the yeasts *Saccharomyces cerevisiae* and *Pichia stipitis*.
637. Etezady-Esfarjani, T., Peti, W. and Wüthrich, K. (2003) *J. Biomol. NMR* **25**, 167–168.
NMR assignment of the conserved hypothetical protein TM1290 of *Thermotoga maritima*.
638. Zahn, R., Güntert, P., von Schroetter, C. and Wüthrich, K. (2003) *J. Mol. Biol.* **326**, 225–234.
NMR structure of a variant human prion protein with two disulfide bridges.
639. Lührs, T., Riek, R., Güntert, P. and Wüthrich, K. (2003) *J. Mol. Biol.* **326**, 1549–1557.
NMR structure of the human doppel protein.
640. Wüthrich, K. (2003) *Angew. Chem. Int. Ed.* **42**, 3340–3363.
NMR studies of structure and function of biological macromolecules (Nobel Lecture).

641. Wüthrich, K. (2003) *Angew. Chem.* **115**, 3462–3486.
NMR–Untersuchungen von Struktur und Funktion biologischer Makromoleküle (Nobel-Vortrag).
642. Wüthrich, K. (2003) *J. Biomol. NMR* **27**, 1–12.
Kurt Wüthrich: Biographical note.
643. Wüthrich, K. (2003) *J. Biomol. NMR* **27**, 13–39.
NMR studies of structure and function of biological macromolecules (Nobel Lecture).
644. Wüthrich, K. (2003), in *Les Prix Nobel 2002* (T. Frängsmyr and B. Lundeberg, eds.) Almquist and Wiksell International, Stockholm, Sweden, pp. 219–234.
Kurt Wüthrich: Biographical note.
645. Wüthrich, K. (2003) in *Les Prix Nobel 2002* (T. Frängsmyr and B. Lundeberg, eds.) Almquist and Wiksell International, Stockholm, Sweden, pp. 235–267.
NMR studies of structure and function of biological macromolecules (Nobel Lecture).
646. Hochuli, M., Wüthrich, K. and Steinmann, B. (2003) *NMR Biomed.* **16**, 224–236.
Two-dimensional NMR spectroscopy of urinary glycosaminoglycans from patients with different mucopolysaccharidoses.
647. Hiller, S., Kohl, A., Fiorito, F., Herrmann, T., Wider, G., Tschopp, J., Grütter, M. and Wüthrich, K. (2003) *Structure* **11**, 1198–1205.
NMR structure of the apoptosis- and inflammation-related NALP1 pyrin domain.
648. Braun, D., Wüthrich, K. and Wider, G. (2003) *J. Magn. Reson.* **165**, 89–94.
Dissection of heteronuclear NMR experiments for studies of magnetization transfer efficiencies.
649. Hilty, C., Wider, G., Fernández, C. and Wüthrich, K. (2003) *J. Biomol. NMR* **27**, 377–382.
Stereospecific assignments of the isopropyl methyl groups of the membrane protein OmpX in DHPC micelles.
650. Fernández, C. and Wüthrich, K. (2003) *FEBS Lett.* **555**, 144–150.
NMR solution structure determination of membrane proteins reconstituted in detergent micelles.
651. Wüthrich, K. (2003) *Biosci. Reports* **23**, 119–168.
NMR studies of structure and function of biological macromolecules (Nobel Lecture).
652. Wüthrich, K. and Wider, G. (2003) *Magn. Reson. Chem.* **41**, 580–588.
Transverse relaxation-optimized NMR spectroscopy with biomacromolecular structures in solution.
653. Etezady-Esfarjani, T. and Wüthrich, K. (2004) *J. Biomol. NMR* **29**, 99–100.
NMR assignment of TM1442, a putative anti- σ factor antagonist from *Thermotoga maritima*.
654. Fernández, C., Hilty, C., Wider, G., Güntert, P. and Wüthrich, K. (2004) *J. Mol. Biol.* **336**,

1211–1221.

NMR structure of the integral membrane protein OmpX.

655. Tafer, H., Hiller, S., Hilty, H., Fernández, C. and Wüthrich, K. (2004) *Biochemistry* **43**, 860–869.
Nonrandom structure in the urea-unfolded *Escherichia coli* outer membrane protein X (OmpX).
656. Hilty, C., Wider, G., Fernández, C. and Wüthrich, K. (2004) *Chem BioChem* **5**, 467–473.
Membrane protein – lipid interactions in mixed micelles studied by NMR spectroscopy with the use of paramagnetic reagents.
657. Fiaux, J., Bertelsen, E.B., Horwich, A.L. and Wüthrich, K. (2004) *J. Biomol. NMR* **29**, 280–297.
Uniform and residue-specific ¹⁵N-labeling of proteins on a highly deuterated background.
658. Iwai, H., Wider, G and Wüthrich, K. (2004) *J. Biomol. NMR* **29**, 395–398.
NMR structure of a variant 434 repressor DNA-binding domain devoid of hydroxyl groups
659. Etezady-Esfarjani, T., Herrmann, T., Peti, W., Klock, H.E., Lesley, S.A. and Wüthrich, K. (2004) *J. Biomol. NMR* **29**, 403–406.
NMR structure determination of the hypothetical protein TM1290 from *Thermotoga maritima* using automated NOESY analysis.
660. Almeida, M.S., Peti, W. and Wüthrich, K. (2004) *J. Biomol. NMR* **29**, 453–454.
¹H-, ¹³C- and ¹⁵N-NMR assignment of the conserved hypothetical protein TM0487 from *Thermotoga maritima*.
661. Peti, W., Etezady-Esfarjani, T., Herrmann, T., Klock, H.E., Lesley, S.A. and Wüthrich, K. (2004) *J. Struct. Funct. Genom.* **5**, 205–215.
NMR for structural proteomics of *Thermotoga maritima*: screening and structure determination.
662. Lysek, D.A. and Wüthrich, K. (2004) *Biochemistry* **43**, 10393–10399.
Prion protein interaction with the C-terminal SH3 domain of Grb2 studied using NMR and optical spectroscopy.
663. Lysek, D.A., Nivon, L.G. and Wüthrich, K. (2004) *Gene* **341**, 249–253.
Amino acid sequence of the *Felis catus* prion protein.
664. Hornemann, S., Schorn, C. and Wüthrich, K. (2004) *EMBO Reports* **5**, 1159–1164.
NMR structure of the bovine prion protein isolated from healthy calf brains.
665. Kelker, M.S., Foss, T.R., Peti, W., Teyton, L., Kelly, J.W., Wüthrich, K. and Wilson, I.A. (2004) *J. Mol. Biol.* **342**, 1237–1248.
Crystal structure of human triggering receptor expressed on myeloid cells 1 (TREM-1) at 1.47 Å.

666. Pervushin, K., Wider, G., Iwai, H. and Wüthrich, K. (2004) *Biochemistry* **43**, 13937–13943.
NMR structures of salt-refolded forms of the 434-repressor DNA-binding domain in 6 M urea.
667. Lysek, D.A., Schorn, C., Nivon, L.G., Esteve-Moya, V., Christen, B., Calzolai, L., von Schroetter, C., Fiorito, F., Herrmann, T., Güntert, P. and Wüthrich, K. (2005) *Proc. Natl. Acad. Sci. USA* **102**, 640–645.
Prion protein NMR structures of cats, dogs, pigs and sheep.
668. Gossert, A.D., Bonjour, S., Lysek, D.A., Fiorito, F. and Wüthrich, K. (2005) *Proc. Natl. Acad. Sci. USA* **102**, 646–650.
Prion protein NMR structures of elk and mouse/elk hybrids.
669. Calzolai, L., Lysek, D.A., Pérez, D.R., Güntert, P. and Wüthrich, K. (2005) *Proc. Natl. Acad. Sci. USA* **102**, 651–655.
Prion protein NMR structures of chickens, turtles, and frogs.
670. Page, R., Peti, W., Wilson, I.A., Stevens, R.C. and Wüthrich, K. (2005) *Proc. Natl. Acad. Sci. USA* **102**, 1901–1905.
NMR screening and crystal quality of bacterially expressed prokaryotic and eukaryotic proteins in a structural genomics pipeline.
671. Michel, E., Damberger, F.F., Chen, A.M., Ishida, Y., Leal, W.S. and Wüthrich, K. (2005) *J. Biomol. NMR* **31**, 65.
Assignments for the *Bombyx mori* pheromone-binding protein fragment BmPBP (1–128) at pH 6.5.
672. Pérez, D.R. and Wüthrich, K. (2005) *J. Biomol. NMR* **31**, 260.
NMR assignment of the *Xenopus laevis* prion protein fragment xlPrP(98–226).
673. Nishiyama, M., Horst, R., Eidam, O., Herrmann, T., Ignatov, O., Vetsch, M., Bettendorf, P., Jelesarov, I., Grütter, M.G., Wüthrich, K., Glockshuber, R. and Capitani, G. (2005) *EMBO J.* **24**, 2075–2086.
Structural basis of chaperone–subunit complex recognition by the type 1 pilus assembly platform FimD.
674. Peti, W., Herrmann, T., Zagnitko, O., Grzechnik, S.K. and Wüthrich, K. (2005) *Proteins* **59**, 387–390.
NMR structure of the conserved hypothetical protein TM0979 from *Thermotoga maritima*.
675. Columbus, L., Peti, W., Etezady-Esfarjani, T., Herrmann, T. and Wüthrich, K. (2005) *Proteins* **60**, 552–557.
NMR structure determination of the conserved hypothetical protein TM1816 from *Thermotoga maritima*.
676. Hiller, S., Fiorito, F., Wüthrich, K. and Wider, G. (2005) *Proc. Natl. Acad. Sci. USA* **102**, 10876–10881.

Automated projection spectroscopy (APSY).

677. Hiller, S., Wider, G., Etezady-Esfarjani, T., Horst, R. and Wüthrich, K. (2005) *J. Biomol. NMR* **32**: 61–70.
Managing the solvent water polarization to obtain improved NMR spectra of large molecular structures.
678. Horst, R., Bertelsen, E.B., Fiaux, J., Wider, G., Horwich, A.L. and Wüthrich, K. (2005) *Proc. Natl. Acad. Sci. USA* **102**, 12748–12753.
Direct NMR observation of a substrate protein bound to the chaperonin GroEL.
679. Peti, W., Johnson, M.A., Herrmann, T., Neuman, B.W., Buchmeier, M.J., Nelson, M., Joseph, J., Page, R., Stevens, R.C., Kuhn, P. and Wüthrich, K. (2005) *J. Virol.* **79**, 12905–12913.
Structural genomics of the severe acute respiratory syndrome coronavirus: nuclear magnetic resonance structure of the protein nsP7.
680. Fadel, W., Bettendorff, P., Herrmann, T., de Zevedo Jr, W.F., Oliveira, E.B., Yamane, T. and Wüthrich, K. (2005) *Toxicon*, **46**, 759–767.
Automated NMR structure determination and disulfide bond identification of the myotoxin crotamine from *Crotalus durissus terrificus*.
681. Almeida, M.S., Herrman, T., Peti, W., Wilson, I.A. and Wüthrich, K. (2005) *Protein Sci.* **14**, 2880–2886.
NMR structure of the conserved hypothetical protein TM0487 from *Thermotoga maritima*: Implications for 216 homologous DUF59 proteins.
682. Lee, D., Hilty, C., Wider, G. and Wüthrich, K. (2006) *J. Magn. Reson.* **178**, 72–76.
Effective rotational correlation times of proteins from NMR relaxation interference.
683. Baker, K.A., Hilty, C., Peti, W., Prince, A., Pfaffinger, P.J., Wider, G., Wüthrich, K. and Choe, S. (2006) *Biochemistry* **45**, 1663–1672.
NMR-derived dynamic aspects of N-type inactivation of a Kv channel suggest a transient interaction with the T1 domain.
684. Lührs, T., Zahn, R. and Wüthrich, K. (2006) *J. Mol. Biol.* **357**, 833–841.
Amyloid formation by recombinant full-length prion proteins in phospholipid bicelle solutions.
685. Peti, W., Page, R., Moy, K., O’Neil-Johnson, M., Wilson, I.A., Stevens, R.C. and Wüthrich, K. (2005) *J. Struct. Funct. Genom.* **6**, 259–267.
Towards miniaturization of a structural genomics pipeline using micro-expression and microcoil NMR.
686. Etezady-Esfarjani, T., Herrmann, T., Horst, R. and Wüthrich, K. (2006) *J. Biomol. NMR* **34**, 3–11.
Automated protein NMR structure determination in crude cell-extract.

687. Johnson, M., Peti, W., Herrmann, T., Wilson, I. and Wüthrich, K. (2006) *Protein Sci.* **15**, 1030–1041.
Solution structure of As11650, an acyl carrier protein from *Anabaena* sp. PCC 7120 with a variant phosphopantetheinylation-site sequence.
688. Serrano, P., Almeida, M.S., Johnson, M.A. and Wüthrich, K. (2006) *J. Biomol. NMR* **36**, 45.
NMR assignment of the protein nsp3a from SARS-CoV.
689. Almeida, M.S., Johnson, M.A. and Wüthrich, K. (2006) *J. Biomol. NMR* **36**, 46.
NMR assignment of the SARS-CoV protein nsp1.
690. Fiorito, F., Hiller, S., Wider, G. and Wüthrich, K. (2006) *J. Biomol. NMR* **35**, 27–37.
Automated resonance assignment of proteins: 6D APSY-NMR.
691. Etezady-Esfarjani, T., Placzek, W.J., Herrmann, T. and Wüthrich, K. (2006) *Magn. Reson. Chem.* **44**, S61–S70.
Solution structures of the putative anti- σ -factor antagonist TM1442 from *Thermotoga maritima* in the free and phosphorylated states.
692. Horst, R., Wider, G., Fiaux, J., Bertelsen, E.B., Horwich, A.L. and Wüthrich, K. (2006) *Proc. Natl. Acad. Sci. USA* **103**, 15445–15450.
Proton–proton Overhauser NMR spectroscopy with polypeptide chains in large structures.
693. Placzek, W.J., Almeida, M.A. and Wüthrich, K. (2006) *J. Biomol. NMR* **36**, 59.
NMR assignment of a human cancer-related nucleoside triphosphatase.
694. Banci, L., Bertini, I., Cantini, F., DellaMalva, N., Herrmann, T., Rosato, A. and Wüthrich, K. (2006) *J. Biol. Chem.* **281**, 29141–29147.
Solution structure and intermolecular interactions of the third metal-binding domain of ATP7A, the Menkes disease protein.
695. Placzek, W.J., Almeida, M.S. and Wüthrich, K. (2007) *J. Mol. Biol.* **367**, 788–801.
NMR structure and functional characterization of a human cancer-related nucleoside triphosphatase.
696. Almeida, M.S., Johnson, M.A., Herrmann, T., Geralt, M. and Wüthrich, K. (2007) *J. Virol.* **81**, 3151–3161.
Novel β -barrel fold in the nuclear magnetic resonance structure of the replicase nonstructural protein 1 from the severe acute respiratory syndrome coronavirus.
697. Gossert, A.D., Hiller, S., Fiorito, F. and Wüthrich K. (2007) *J. Biomol. NMR* **38**, 195.
NMR assignment of the *E. coli* type 1 pilus protein FimF.
698. Johnson, M.A., Southworth, M.W., Perler, F.B. and Wüthrich K. (2007) *Biomol. NMR Assign.* **1**, 19–21.
NMR assignment of a KlbA intein precursor from *Methanococcus jannaschii*.
699. Placzek, W.J., Etezady-Esfarjani, T., Herrmann, T., Pedrini, B., Peti, W., Alimenti, C., Luporini, P. and Wüthrich, K. (2007) *IUBMB Life* **59**, 578–585.

Cold-adapted signal proteins: NMR structures of pheromones from the antarctic ciliate *Euploites nobilii*.

700. Johnson, M.A., Southworth, M.W., Herrmann, T., Brace, L., Perler, F.B. and Wüthrich, K. (2007) *Protein Sci.* **16**, 1316–1328.
NMR structure of a Klba intein precursor from *Methanococcus jannaschii*.
701. Damberger, F.F., Ishida, Y., Leal, W.S. and Wüthrich, K. (2007) *J. Mol. Biol.* **373**, 811–819.
Structural basis of ligand binding and release in insect pheromone-binding proteins: NMR structure of *Antheraea polyphemus* PBP1 at pH 4.5.
702. Serrano, P., Johnson, M.A., Almeida, M.S., Horst, R., Herrmann, T., Joseph, J.S., Neuman, B.W., Subramanian V., Saikatendu, K.S., Buchmeier, M.J., Stevens, R.C., Kuhn, P. and Wüthrich, K. (2007) *J. Virol.* **81**, 12049–12060.
Nuclear magnetic resonance structure of the N-terminal domain of nonstructural protein 3 from the severe acute respiratory syndrome coronavirus.
703. Chatterjee, A., Johnson, M.A., Serrano, P., Pedrini, B. and Wüthrich, K. (2007) *Biomol. NMR Assign.* **1**, 191–194.
NMR assignment of the domain 513–651 from the SARS-CoV nonstructural protein nsp3.
704. Etezady-Esfarjani, T., Hiller, S., Villalba, C. and Wüthrich, K. (2007) *J. Biomol. NMR* **39**, 229–238.
Cell-free protein synthesis of perdeuterated proteins for NMR studies.
705. Hiller, S., Wasmer, C., Wider, G. and Wüthrich, K. (2007) *J. Am. Chem. Soc.* **129**, 10823–10828.
Sequence-specific resonance assignment of soluble nonglobular proteins by 7D APSY-NMR spectroscopy.
706. Sigurdson, C.J., Nilsson, K.P.R., Hornemann, S., Manco, G., Polymenidou, M., Schwarz, P., Leclerc, M., Hammarström, P., Wüthrich, K. and Aguzzi, A. (2007) *Nature Methods* **12**, 1023–1030.
Prion strain discrimination using luminescent conjugated polymers.
707. Horst, R., Fenton, W.A., Englander, W.S., Wüthrich, K. and Horwich A.L. (2007) *Proc. Natl. Acad. Sci. USA* **104**, 20788–20792.
Folding trajectories of human dihydrofolate reductase inside the GroEL-GroES chaperonin cavity and free in solution.
708. Pedrini, B., Placzek, W.J., Koculi, E., Alimenti, C., LaTerza, A., Luporini, P. and Wüthrich, K. (2007) *J. Mol. Biol.* **372**, 277–286.
Cold-adaptation in sea-water-borne signal proteins: sequence and NMR structure of the pheromone En-6 from the antarctic ciliate *Euploites nobilii*.
709. Gossert, A.D., Bettendorff, P., Puorger, C., Vetsch, M., Herrmann, T., Glockshuber, R. and Wüthrich, K. (2008) *J. Mol. Biol.* **375**, 752–763.

NMR structure of the *Escherichia coli* type 1 pilus subunit FimF and its interactions with other pilus subunits.

710. Christen, B., Wüthrich, K. and Hornemann, S. (2008) *FEBS J.* **275**, 263–270.
Putative prion protein from Fugu (*Takifugu rubripes*).
711. Hiller, S., Wider, G., Imbach, L.L. and Wüthrich, K. (2008) *Angew. Chem. Int. Ed.* **47**, 977–981.
Interactions with hydrophobic clusters in the urea-unfolded membrane protein OmpX.
712. Zhang, Q., Horst, R., Geralt, M., Ma, X., Hong, W., Finn, M.G. Stevens, R. and Wüthrich, K. (2008) *J. Am. Chem. Soc.* **130**, 7357–7363.
Microscale NMR screening of new detergents for membrane protein structural biology.
713. Neuman, B.W., Joseph, J.S., Saikatendu, K.S., Serrano, P., Chatterjee, A., Johnson, M.A., Liao, L., Klaus, J.P., Yates, J.R., Wüthrich, K., Stevens, R., Buchmeier, M.J. and Kuhn, P. (2008) *J. Virol.* **82**, 5279–5294.
Proteomics analysis unravels the functional repertoire of Coronavirus nonstructural protein 3.
714. Volk, J., Herrmann, T. and Wüthrich, K. (2008) *J. Biomol. NMR* **41**, 127–138.
Automated sequence-specific protein NMR assignment using the memetic algorithm MATCH.
715. Christen, B., Pérez, D.R., Hornemann, S. and Wüthrich, K. (2008) *J. Mol. Biol.* **383**, 306–312.
NMR structure of the bank vole prion protein at 20 °C contains a structured loop of residues 165–171.
716. Billeter, M., Wagner, G. and Wüthrich K. (2008) *J. Biomol. NMR* **42**, 155–158.
Solution NMR structure determination of proteins revisited.
717. Fiorito, F., Herrmann, T., Damberger, F.F. and Wüthrich K. (2008) *J. Biomol. NMR* **42**, 23–33.
Automated amino acid side-chain NMR assignment of proteins using ¹³C- and ¹⁵N-resolved 3D [¹H,¹H]-NOESY.
718. Serrano, P., Johnson, M.A., Chatterjee, A., Pedrini, B. and Wüthrich, K. (2008) *Biomol. NMR Assign.* **2**, 135–138.
NMR assignment of the nonstructural protein nsp3(1066–1181) from SARS-CoV.
719. Hiller, S., Wider, G. and Wüthrich, K. (2008) *J. Biomol. NMR* **42**, 179–195.
APSY-NMR with proteins: practical aspects and backbone assignment.
720. Polymenidou, M., Moos, R., Scott, M., Sigurdson, C., Shi, Y.-Z., Yajima, B., Hafner-Bratkovic, I., Jerala, R., Hornemann, S., Wüthrich, K., Bellon, A., Vey, M., Garen, G., James, M.N.G., Kav, N. and Aguzzi, A. (2008) *PLoS ONE* **3**, e3872, 1–17.
The POM monoclonals: a comprehensive set of antibodies to non-overlapping prion protein epitopes.

721. Sigurdson, C.J., Nilsson, K.P., Hornemann, S., Heikenwalder, M., Manco, G., Schwarz, P., Ott, D., Rülicke, T., Liberski, P.P., Julius, C., Falsig, J., Stitz, L., Wüthrich, K. and Aguzzi, A. (2009) *Proc. Natl. Acad. Sci. USA* **106**, 304–309.
De novo generation of transmissible spongiform encephalopathy by mouse transgenesis.
722. Chatterjee, A., Johnson, M.A., Serrano, P., Pedrini, B., Joseph, J.J., Neuman, B.W., Saikatendu, K., Buchmeier, M.J., Kuhn, P. and Wüthrich, K. (2009) *J. Virol.* **83**, 1823–1836
NMR structure shows that the SARS-unique domain contains a macrodomain fold.
723. Hornemann, S., Christen, B., von Schroetter, C., Pérez, D. and Wüthrich, K. (2009) *FEBS J.* **276**, 2359–2367.
Prion protein library of recombinant constructs for structural biology.
724. Christen, B., Hornemann, S., Damberger, F. F. and Wüthrich, K. (2009) *J. Mol. Biol.* **389**, 833–845.
Prion protein NMR structure from tammar wallaby (*Macropus eugenii*) shows that the β 2– α 2 loop is modulated by long-range sequence effects.
725. Alimenti,C., Vallesi, A., Pedrini, B., Wüthrich, K. and Luporini, P. (2009) *IUBMB Life* **61**, 838–845.
Molecular cold-adaptation: Comparative analysis of two homologous families of psychrophilic and mesophilic signal proteins of the protozoan ciliate, *Euploites*.
726. Honnappa, S., Montenegro Gouveia, S., Weisbrich, A., Damberger, F.F., Bhavesh, N.S., Jawhari, H., Grigoriev, I., van Rijssel, F.J.A., Buey, R.M., Lawera, A., Jelesarov, I., Winkler, F.K., Wüthrich, K., Akhmanova, A. and Steinmetz, M.O (2009) *Cell* **138**, 366–376.
An EB1-binding motif acts as a microtubule tip localization signal.
727. Hornemann, S., von Schroetter, C., Damberger, F.F. and Wüthrich, K. (2009) *J. Biol. Chem.* **284**, 22713–22721.
Prion protein–detergent micelle interactions studied by NMR in solution.
728. Serrano, P., Johnson, M.A., Chatterjee, A., Neuman, B.W., Joseph, J.S., Buchmeier, M.J., Kuhn, P. and Wüthrich, K. (2009) *J. Virol.* **83**, 12998–13008.
Nuclear magnetic resonance structure of the nucleic acid-binding domain of severe acute respiratory syndrome coronavirus nonstructural protein 3.
729. Stanczak, P., Horst, R., Serrano, P. and Wüthrich, K. (2009) *J. Am. Chem. Soc.* **131**, 18450–18456
NMR characterization of membrane protein–detergent micelle solutions by use of microcoil equipment.
730. De Groot, C.O., Jelesarov, I., Damberger, F.F., Bjelić, S., Schärer, M.A., Bhavesh, N.S., Grigoriev, I., Buey, R.M., Wüthrich, K., Capitani, G., Akhmanova, A. and Steinmetz, M.O. (2010) *J. Biol. Chem.* **285**, 5802–5814.
Molecular insights into mammalian end-binding protein heterodimerization.

731. Pérez, D.R., Damberger, F.F. and Wüthrich, K. (2010) *J. Mol. Biol.* **400**, 121–128; **402**, 929–930.
Horse prion protein NMR structure and comparisons with related variants of the mouse prion protein.
732. Sigurdson, C.J., Nilsson, K.P.R., Hornemann, S., Manco, G., Fernández-Borges, Schwarz, P., Wüthrich, K. and Aguzzi, A. (2010) *J. Clin. Invest.* **120**, 2590–2599.
A molecular switch controls interspecies prion disease transmission in mice.
733. Johnson, M.A., Chatterjee, A., Neuman, B.W. and Wüthrich, K. (2010) *J. Mol. Biol.* **400**, 724–742.
SARS coronavirus unique domain: three-domain molecular architecture in solution and RNA binding.
734. Vallesi, A., Alimenti, C., Di Giuseppe, G., Dini, F., Pedrini, B., Wüthrich, K. and Luporini, P. (2010) *Polar Science* **4**, 237–244.
The water-born protein pheromones of the polar protozoan ciliate, *Euplotes nobilis*: Coding genes and molecular structures.
735. Johnson, M.A., Jaudzems, K. and Wüthrich, K. (2010) *J. Mol. Biol.* **402**, 619–628.
NMR structure of the SARS-CoV nonstructural protein 7 in solution at pH 6.5.
736. Vila, J.A., Serrano, P., Wüthrich, K. and Scheraga, H.A. (2010) *J. Biomol. NMR* **48**, 23–30.
Sequential nearest-neighbor effects on computed $^{13}\text{C}^a$ chemical shifts.
737. Elsliger, M-A., Deacon, A.M., Godzik, A., Lesley, S.A., Wooley, J., Wüthrich, K. and Wilson, I.A. (2010) *Acta Cryst. F* **66**, 1137–1142.
The JCSG high-throughput structural biology pipeline.
738. Wüthrich, K. (2010) *Acta Cryst. F* **66**, 1365–1366.
NMR in a crystallography-based high-throughput protein structure-determination environment.
739. Jaudzems, K., Geralt, M., Serrano, P., Mohanty, B., Horst, R., Pedrini, B., Elsliger, M-A., Wilson, I.A. and Wüthrich, K. (2010) *Acta Cryst. F* **66**, 1367–1380.
NMR structure of the protein NP_247299.1: comparison with the crystal structure.
740. Mohanty, B., Serrano, P., Pedrini, B., Jaudzems, K., Geralt, M., Horst, R., Herrmann, T., Elsliger, M-A., Wilson, I.A. and Wüthrich, K. (2010) *Acta Cryst. F* **66**, 1381–1392.
Comparison of NMR and crystal structures for the proteins TM1112 and TM1367.
741. Serrano, P., Pedrini, B., Geralt, M., Jaudzems, K., Mohanty, B., Horst, R., Herrmann, T., Elsliger, M-A., Wilson, I.A. and Wüthrich, K. (2010) *Acta Cryst. F* **66**, 1393–1405.
Comparison of NMR and crystal structures highlights conformational isomerisms in protein active sites.

742. Choutko, A., Glättli, A., Fernández, C., Hilty, C., Wüthrich, K. and van Gunsteren, W.F. (2011) *Eur Biophys. J.* **40**, 39–58.
Membrane protein dynamics in different environments: simulation study of the outer membrane protein X in a lipid bilayer and in a micelle.
743. Orcajo-Rincón, A.L., Ortega-Gutiérrez, S., Serrano, P., Torrecillas, I.R., Wüthrich, K., Campillo, M., Pardo, L., Viso, A., Benhamú, B. and López-Rodríguez, M.L. (2011) *J. Med. Chem.* **54**, 1096–1100..
Development of non-peptide ligands of growth factor receptor-bound protein 2-Src homology 2 domain using molecular modeling and NMR spectroscopy.
744. Di Giuseppe, G., Erra, F., Dini, F., Alimenti, C., Vallesi, A., Pedrini, B., Wüthrich, K. and Luporini, P. (2011). *Proc. Natl. Acad. Sci. USA.* **108**, 3181–3186.
Antarctic and arctic populations of the ciliate *Euploites nobilii* show common pheromone-mediated cell–cell signaling and cross-mating.
745. Michel, E., Damberger, F.F., Ishida, Y., Fiorito, F., Lee, D.H., Leal, W.S. and Wüthrich, K. (2011) *J. Mol. Biol.* **408**, 922–931.
Dynamic conformational equilibria in the physiological function of the *Bombyx mori* pheromone-binding protein.
746. Wahab, A.T., Serrano, P., Geralt, M. and Wüthrich, K. (2011) *Protein Science* **20**, 1137–1144.
NMR structure of the *Bordetella bronchiseptica* protein NP_888769.1 establishes a new phage-related protein family PF13554.
747. Koculi, Eda, Horst, R., Horwich, A.L. and Wüthrich, K. (2011) *Protein Science* **20**, 1380–1386.
Nuclear magnetic resonance spectroscopy with the stringent substrate rhodanese bound to the single-ring variant SR1 of the *E. coli* chaperonin GroEL.
748. Horst, R., Horwich, A.L. and Wüthrich, K. (2011) *J. Am. Chem. Soc.* **20**, 16354–16357.
Translational diffusion of macromolecular assemblies measured using transverse-relaxation-optimized pulsed field gradient NMR.
749. Damberger, F.F., Christen, B., Pérez, D.R., Hornemann, S. and Wüthrich, K. (2011) *Proc. Natl. Acad. Sci. USA* **108**, 17308–17313.
Cellular prion protein conformation and function.
750. Sigurdson, C.J., Joshi-Barr, S., Bett, C., Winson, O., Manco, G., Schwarz, P., Rülicke, T., Nilsson, K.P.R., Margalith, I., Raeber, A., Peretz, D., Hornemann, S., Wüthrich, K. and Aguzzi, A. (2011) *J. Neurosci.* **31**, 13840–13847.
Spongiform encephalopathy in transgenic mice expressing a point mutation in the β2–α2 loop of the prion protein.
751. Liu, J.J., Horst, R., Katritch, V., Stevens, R.C. and Wüthrich, K. (2012) *Science* **335**, 1106–1110.

Biased signaling pathways in β_2 -adrenergic receptor characterized by ^{19}F -NMR.

752. Horst, R., Stanczak, P., Serrano, P. and Wüthrich, K. (2012) *J. Phys. Chem. B* **116**, 6775–6780.
Translational diffusion measurements by microcoil NMR in aqueous solutions of the Fos-10 detergent-solubilized membrane protein OmpX.
753. Vallesi, A., Alimenti, C., Pedrini, B., Di Giuseppe, G., Dini, F., Wüthrich, K. and Luporini, P. (2012) *Marine Genomics* **8**, 9–13.
Coding genes and molecular structures of the diffusible signaling proteins (pheromones) of the polar ciliate, *Euploites nobilii*.
754. Michel, E. and Wüthrich, K. (2012) *J. Biomol. NMR* **53**, 43–51.
High-yield *Escherichia coli*-based cell-free expression of human proteins.
755. Serrano, P., Pedrini, B., Mohanty, B., Geralt, M., Herrmann, T. and Wüthrich K. (2012) *J. Biomol. NMR* **53**, 341–354.
The J-UNIO protocol for automated protein structure determination by NMR in solution.
756. Michel, E. and Wüthrich, K. (2012) *FEBS. J.* **279**, 3176–3184.
Cell-free expression of disulfide-containing eukaryotic proteins for structural biology.
757. Stanczak, P., Zhang, Q., Horst, R., Serrano, P. and Wüthrich, K. (2012) *J. Biomol. NMR* **54**, 129–133.
Micro-coil NMR to monitor optimization of the reconstitution conditions for the integral membrane protein OmpW in detergent micelles.
758. Christen, B., Hornemann, S., Damberger, F.F. and Wüthrich, K. (2012) *J. Mol. Biol.* **423**, 796–502.
Prion protein mPrP[F175A]: structure and stability in solution.
759. Horst, R., Stanczak, P., Stevens, R.C. and Wüthrich, K. (2013) *Angew. Chem. Int. Ed.* **52**, 331–335
 β_2 -adrenergic receptor solutions for structural biology analyzed with micro-scale NMR diffusion measurements.
760. Stevens, R., Cherezov, V., Katritch, V., Abagyan, R., Kuhn, P., Rosen, H. and Wüthrich, K. (2013) *Nature Rev. Drug Discovery* **12**, 1–10.
The GPCR network: a large-scale collaboration to determine human GPCR structure and function.
761. Geralt, M., Alimenti, C., Vallesi, A., Luporini, P. and Wüthrich, K. (2013) *Biology* **2**, 142–150.
Thermodynamic stability of psychrophilic and mesophilic pheromones of the protozoan ciliate *Euploites*.
762. Michel, E., Srisovska, L., Wüthrich, K. and Allain, F.H.-T. (2013) *ChemBioChem* **14**, 457–466.

Amino acid-selective segmental isotope labeling of multidomain proteins for structural biology.

763. Christen, B., Damberger, F.F., Pérez, D.R., Hornemann, S. and Wüthrich, K. (2013) *Proc. Natl. Acad. Sci. USA* **110**, 8549–8554.
Structural plasticity of the cellular prion protein and implications in health and disease.
764. Serrano, P., Geralt, M., Mohanty, B. and Wüthrich, K. (2013) *Protein Science* **22**, 1000–1007.
Structural representative of the protein family PF14466 has a new fold and establishes links with the C2 and PLAT domains from the widely distant Pfams PF00168 and PF01477.
765. Zarco-Zavala, M., Morales-Ríos, E., Serrano-Navarro, P., Wüthrich, K., Mendoza-Hernández, G., Ramírez-Silva L. and García-Trejo, J.J. (2013) *Biochim. Biophys. Acta* **1827**, 60.
Corrigendum to “The ζ subunit of the α -proteobacterial F₁F₀-ATP synthase in *Paracoccus denitrificans*: A novel control mechanism of the central rotor” [Biochim. Biophys. Acta **1817S** (2012) S27–S28].
766. Didenko, T., Liu, J.J., Horst, R., Stevens, R.C. and Wüthrich, K. (2013) *Curr. Opin. Struct. Biol.* **23**, 740–747.
Fluorine-19 NMR of integral membrane proteins illustrated with studies of GPCRs.
767. Pedrini, B., Serrano, P., Mohanty, B., Geralt, M. and Wüthrich, K. (2013) *Biopolymers* **99**, 825–831.
NMR-profiles of protein solutions.
768. Horst, R., Liu, J.J., Stevens, R.C. and Wüthrich, K. (2013) *Angew. Chem. Int. Ed.* **52**, 331–335.
 β 2-adrenergic receptor activation by agonists studied with ¹⁹F-NMR spectroscopy.
769. Damberger, F.F., Michel, E., Ishida, Y., Leal, W.S. and Wüthrich, K. (2013) *Proc. Natl. Acad. Sci. USA* **110**, 18680–18685.
Pheromone discrimination by a pH-tuned polymorphism of the *Bombyx mori* pheromone-binding protein.
770. Kurt, T.D., Bett, C., Fernández-Borges, N., Johi-Barr, S., Hornemann, S., Rülicke, T., Castilla, J., Wüthrich, K., Aguzzi, A. and Sigurdson, C.J. (2014) *J. Neurosci.* **34**, 1022–1027.
Prion transmission prevented by modifying the β 2- α 2 loop structure of host PrP^C.
771. Sušac, L., Horst, R. and Wüthrich, K. (2014) *ChemBioChem* **15**, 995–1000.
Solution-NMR characterization of outer-membrane protein A from *E. coli* in lipid bilayer nanodiscs and detergent micelles.
772. Horst, R., Stanczak, P. and Wüthrich, K. (2014) *Structure* **22**, 1–6.
NMR polypeptide backbone conformation of the *E. coli* outer membrane protein W.

773. Serrano, P., Geralt, M., Mohanty, B. and Wüthrich, K. (2014) *J. Mol. Biol.* **426**, 2547–2553. NMR structures of α -proteobacterial ATPase-regulating ζ -subunits.
774. Wüthrich, K., Wilson I.A., Hilvert, D., Wolan, D. and De Wit, A., eds. (2014) *New Chemistry and New Opportunities from the Expanding Protein Universe*. Proceedings of the 23rd Solvay Conference on Chemistry, World Scientific, Singapore.
775. Wüthrich, K. (2014) in *New Chemistry and New Opportunities from the Expanding Protein Universe*. Proceedings of the 23rd Solvay Conference on Chemistry (Wüthrich, K., Wilson I.A., Hilvert, D., Wolan, D. and De Wit, A., eds.), World Scientific, Singapore, 182–185. Studies of GPCR conformations in non-crystalline milieus.
776. Mohanty, B., Serrano, P., Geralt, M. and Wüthrich, K. (2014) *J. Biomol. NMR* **61**, 83–87. NMR structure determination of the protein NP_344798.1 as the first representative of Pfam PF06042.
777. Jaudzems, K., Pedrini, B., Geralt, M., Serrano, P. and Wüthrich, K. (2014) *J. Biomol. NMR* **61**, 65–72.
J-UNIO protocol used for NMR structure determination of the 206-residue protein NP_346487.1 from *Streptococcus pneumoniae* TIGR4.
778. Dutta, S.K., Serrano, P., Proudfoot, A., Geralt, M., Pedrini, B., Herrmann, T. and Wüthrich, K. (2014) *J. Biomol. NMR* **61**, 47–53.
APSY-NMR for protein backbone assignment in high-throughput structural biology.
779. Horst, R. and Wüthrich, K. (2015) *Bio-protocol* **5** (14) <http://www.bio-protocol.org/e1539>. Micro-scale NMR experiments for monitoring the optimization of membrane protein solutions for structural biology.
780. Didenko, T., Proudfoot, A., Dutta, S.K., Serrano, P. and Wüthrich, K. (2015) *Chem. Eur. J.* **21**, 12363–12369.
Non-uniform sampling and J-UNIO automation for efficient protein NMR structure determination.
781. Dutta, S.K., Serrano, P., Geralt, M., Axelrod, H.L., Xu, Q., Lesley, S.A., Godzik, A., Deacon, A.M., Elsliger, M.A., Wilson, I.A. and Wüthrich, K. (2015) *Protein Sci.* **24**, 1600–1608.
Cofactor-induced reversible folding of flavodoxin-4 from *Lactobacillus acidophilus*.
782. O'Connor, C., White, K.L., Doncescu, N., Didenko, T., Roth, B.L., Czaplicki, G., Stevens, R.C., Wüthrich, K. and Milon, A. (2015) *Proc. Natl. Acad. Sci. USA* **112**, 11852–11857.
NMR structure and dynamics of the agonist dynorphin peptide bound to the human kappa opioid receptor.
783. Lamichhane, R., Liu, J.J., Pljevaljcic, G., White, K.L., van der Schans, E., Katritch, V., Stevens, R.C., Wüthrich, K. and Millar, D.P. (2015) *Proc. Natl. Acad. Sci. USA* **112**, 14254–14259.
Single-molecule view of basal activity and activation mechanisms of the G protein-coupled receptor β_2 AR.

784. Wüthrich, K. (2015). *JOSHA – J. Science, Humanities and Arts*. DOI: 10.17160/josha.2.7.84.
The NMR view of proteins.
785. Sušac, L., O'Connor, C.O., Stevens, R.C. and Wüthrich, K. (2015) *Angew. Chem. Int. Ed.* **54**, 15246–15249.
In-membrane chemical modification (IMCM) for site-specific chromophore labeling of GPCRs.
786. Martin, B.T., Serrano, P., Geralt, M. and Wüthrich K. (2016) *Structure* **24**, 158–164.
Nuclear magnetic resonance structure of a novel globular domain in RBM10 containing OCRE, the octamer repeat sequence motif.
787. Stepanyuk, G.A., Serrano, P., Peralta, E., Farr, C.L., Axelrod, H.L., Geralt, M., Das, D., Chiu, H.J., Jaroszewski, L., Deacon, A.M., Lesley, S.A., Elsliger, M.A., Godzik, A., Wilson, I.A., Wüthrich, K., Salomon, D.R. and Williamson, J.R. (2016) *Acta Cryst D.* **72**, 497–511.
UHM–ULM interactions in the RBM39–U2AF65 splicing-factor complex.
788. Proudfoot, A., Axelrod, H.L., Geralt, M., Fletterick, R.J., Yumoto, F., Deacon, A.M., Elsliger, M.A., Wilson, I.A., Wüthrich, K. and Serrano, P. (2016) *J. Mol. Biol.* **428**, 1130–1141.
Dlx5 homeodomain: DNA complex: structure, binding and effect of mutations related to split hand and foot malformation syndrome.
789. Mohanty, B., Geralt, M., Wüthrich, K. and Serrano, P. (2016) *Protein Sci.* **25**, 917–925.
NMR reveals structural rearrangements associated to substrate insertion in nucleotide-adding enzymes.
790. Liu, D. and Wüthrich, K. (2016) *J. Biomol. NMR* **65**, 1–5.
Ring current shifts in ¹⁹F-NMR of membrane proteins.
791. Proudfoot, A., Geralt, M., Elsliger, M.A., Wilson, I.A., Wüthrich, K. and Serrano, P. (2016) *Structure* **24**, 1372–1379.
Dynamic local polymorphisms in the Gbx1 homeodomain induced by DNA binding.
792. Serrano, P., Dutta, S.K., Proudfoot, A., Mohanty, B., Susac, L., Martin, B., Geralt, M., Jaroszewski, L., Godzik, A., Elsliger, M., Wilson, I.A. and Wüthrich, K. (2016) *FEBS J.* **283**, 3870–3881.
NMR in structural genomics to increase structural coverage of the protein universe.
793. Beuck, C., Williamson, J.R., Wüthrich, K. and Serrano, P. (2016) *Protein Sci.* **25**, 1545–1550.
The acidic domain is a unique structural feature of the splicing factor SYNCRIPI.
794. Landreh, M., Sawaya, M.R., Hipp, M.S., Eisenberg, D.S., Wüthrich, K. and Hartl, F.U. (2016) *J. Intern. Med.* **280**, 164–176.
The formation, function and regulation of amyloids: insights from structural biology.
795. Eddy, M.T., Didenko, T., Stevens, R.C. and Wüthrich, K. (2016) *Structure* **24**, 2190–2197.
β₂-adrenergic receptor conformational response to fusion protein in the third intracellular loop.

796. Serrano, P., Aubol, B.E., Keshwani, M.M., Forli, S., Ma, C.T., Dutta, S.K., Geralt, M., Wüthrich, K. and Adams J.A. (2016) *J. Mol.Biol.* **428**, 2430–2445.
Directional phosphorylation and nuclear transport of the splicing factor SRSF1 is regulated by an RNA recognition motif.
797. Leske, H., Hornemann, S., Herrmann, U.S., Zhu, C., Dametto, P., Li, B., Laferriere, F., Polymenidou, M., Pelczar, P., Reimann, R.R., Schwarz, P., Rushing, E.J., Wüthrich, K. and Aguzzi, A. (2017) *PLOS ONE* doi:10.1371/journal.pone.0170503.
Protease resistance of infectious prions is suppressed by removal of a single atom in the cellular prion protein.
798. Hou, Y., Hu, W., Li, X., Skinner, J.J., Liu, D. and Wüthrich, K. (2017) *J. Biomol. NMR* **68**, 1–6.
Solvent-accessibility of discrete residue positions in the polypeptide hormone glucagon by ¹⁹F-NMR observation of 4-fluorophenylalanine.
799. Calderalo, E., Barducci, A., Wüthrich, K. and Parrinello, M. (2017) *Proc. Natl. Acad. Sci. USA* **114**, 9617–9622.
Prion protein β2–α2 loop conformational landscape.
800. Eddy, M.T., Lee, M.-Y., Gao, Z.-G., White, K.L., Didenko, T., Horst, R., Audet, M., Stanczak, P., McClary, K.M., Han, G.W., Jacobson, K.A., Stevens, R. and Wüthrich, K. (2018) *Cell* **172**, 68–80.
Allosteric coupling of drug binding and intracellular signaling in the A_{2A} adenosine receptor.

801. Serrano, P., Hammond, J.A., Geralt, M. and Wüthrich, K. (2018) *Biochemistry* **57**, 1563–1567.
Splicing site recognition by synergy of three domains in splicing factor RBM10.
802. Eddy, M.T., Gao, Z.-G., Mannes, P., Patel, N. Jacobson, K.A., Katritch, V., Stevens, R.C. and Wüthrich, K. (2018) *J. Am. Chem. Soc.* **140**, 8228–8235
Extrinsic tryptophans as NMR probes of allosteric coupling in membrane proteins: application to the A_{2A} adenosine receptor.
803. Wüthrich, K., Grubbs, R.H., Visart de Bocarmé, T. and De Wit, A., eds. (2018) *Catalysis in Chemistry and Biology*. Proceedings of the 24th Solvay Conference on Chemistry, World Scientific, Singapore.
804. Wüthrich, K. (2018) in ‘*Il cibo: salute, cultura, piacere e tormento*’, *Atti del Meeting “Le Due Culture”*, IX edizione, O. Zecchino, G. Capasso, M. De Felice, G. Marino, C. Pisano, eds., Fondazione Biogem, Ariano Irpino, Italy.
Basic Scientific Research and Daily Human Life.
805. Sušac, L., Eddy, M.T., Didenko, T., Stevens, R.C. and Wüthrich, K. (2018) *Proc. Natl. Acad. Sci. USA* **115**, 12733–12738.
A_{2A} adenosine receptor functional states characterized by ¹⁹F-NMR.
806. Aubol, B.E., Serrano, P., Fattet, L., Wüthrich, K. and Adams, J.A. (2018) *J. Biol. Chem.* **293**, 16751–16760.
Molecular interactions connecting the function of the serine-arginine-rich protein SRSF1 to protein phosphatase 1.
807. Shimada, I., Ueda, T., Kofuku, Y., Eddy, M.T. and Wüthrich, K. (2019) *Nat. Rev. Drug Disc.* **18**, 59–82.
GPCR drug discovery: integrating solution NMR data with crystal and cryo-EM structures.
808. Chen, S., Lu, M., Liu, D., Yang, L., Yi, C., Ma, L., Zhang, H., Liu, Q., Frimurer T.M., Wang, M.W., Schwartz, T.W., Stevens, R.C., Wu, B., Wüthrich, K. and Zhao, Q. (2019) *Nat. Commun.* **10**, 638–646.
Human substance P receptor binding mode of the antagonist drug aprepitant by NMR and crystallography.
809. Xue, D., Xu, T., Wang, H., Wu, M., Yuan, Y., Wang, W., Tan, Q., Zhao, F., Zhou, F., Hu, T., Jiang, Z., Liu, Z.-J., Zhao, S., Liu, D., Wüthrich, K. and Tao, H. (2019) *Chemistry Eur. J.* **25**, 11635–11640.
Disulfide-containing detergents (DCDs) for the structural biology of membrane proteins.
810. Lamichhane, R., Liu, J.J., White, K.L., Katrich, V., Stevens, R.C., Wüthrich, K. and Millar, D. (2020) *Structure* **28**, 1–7.
Biased signaling of the G-protein-coupled receptor β₂AR is governed by conformational exchange kinetics.

811. Zhang, J., Yan, W., Duan, W., Wüthrich, K. and Cheng, J. (2020) *Pharmaceuticals* **13**, 237–250.
Tumor immunotherapy using A_{2A} adenosine receptor antagonists.
812. Martin, B.T., Malmstrom, R.D., Amaro, R.E. and Wüthrich, K. (2021) *ChemBioChem* **22**, 565–580.
OCRE domains of splicing factors RBM5 and RBM10: tyrosine ring-flip frequencies determined by integrated use of ¹H NMR spectroscopy and molecular dynamics simulations.
813. Eddy, M.T., Martin, B.T. and Wüthrich, K. (2021) *Structure* **29**, 170–176.
A_{2A} adenosine receptor partial agonism related to structural rearrangements in an activation microswitch.
814. Wang, H., Hu, W., Liu, D. and Wüthrich, K. (2021) *FEBS J.* doi: 10.1111/febs.15686.
Design and preparation of the class B G protein-coupled receptors GLP-1R and GCGR for ¹⁹F-NMR studies in solution.
815. Wüthrich, K., Weckhuysen, B., Rongy, L. and De Wit, A., eds. (2021) *Computational Modeling: from Chemistry to Materials to Biology*, Proceedings of the 25th Solvay Conference on Chemistry. World Scientific, Singapore.
816. Wüthrich, K. (2021) *J. Magn. Reson.* doi: 10.1016/j.jmr.2021.107031.
Brownian motion, spin diffusion and protein structure determination in solution.
817. Wüthrich, K. (2021) *Nature* **595**, 645.
Richard R. Ernst (1937 – 2021).
818. Wüthrich, K. (2021) *NMR with Biological Macromolecules in Solution*. World Scientific, Singapore.
819. Wüthrich, K. (2021) *J. Magn. Reson.* **331**, doi: 10.1016/j.jmr.2021.107047.
Richard R. Ernst (1933–2021) – A life of NMR, classical music and Tibetan art.
820. Pan, B., Liu, D., Yang, L. and Wüthrich, K. (2022) *Proc. Natl. Acad. Sci. USA* **119**, doi: 10.1073/pnas.2122682119.
GPCR large-amplitude dynamics by ¹⁹F-NMR of aprepitant bound to the neurokinin 1 receptor.
821. Zhang, J., Luo, Z. Duan, W. Yang, K., Ling, L., Yan, W. Liu, R. Wüthrich, K., Jiang, H., Xie, C. and Cheng J. (2022) *Eur. J. Med. Chem.*, doi:10.1016/j.ejmech.2022.114326.
Dual-acting antitumor agents targeting the A_{2A} adenosine receptor and histone deacetylases: Design and synthesis of 4-(furan-2-yl)-2-1H-pyrazolo[3,4-d]pyrimidin-6-amine derivatives.
822. Ge, H., Wang, H., Pan, B., Feng, D., Guo, C. Yang, L., Liu, D. and Wüthrich, K. (2022) *Molecules* doi: 10.3390/molecules27092658.
G protein-coupled receptor (GPCR) reconstitution and labeling for solution nuclear magnetic resonance (NMR) studies of the structural basis of transmembrane signaling.