

## *Curriculum Vitae* : Prof. Lyndon EMSLEY

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Born: 29 November 1964, Durham, England.

Nationality: British

Université de Lyon, CNRS / ENS-Lyon / UCB-Lyon 1, Centre de RMN à Très Hauts Champs, 5 rue de la Doua, 69100 Villeurbanne, France ([www.crmn-lyon.fr](http://www.crmn-lyon.fr))

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Sept. 1983 - Jul. 1986. Imperial College of Science and Technology, London., (BSc.)

Oct. 1986 - Dec. 1987. Trainee patent attorney, Haseltine Lake & Co., Bristol, U.K.

Jan. 1988 - Jul. 1991. Université de Lausanne, Switzerland. (PhD.)

Aug. 1991 - Oct. 1993. University of California, Berkeley, USA. (Post-doc)

Nov. 1993 – Oct. 1994. Centre d'Études Nucléaires, Grenoble, France. (Post-doc)

Oct. 1994 - September 1995. École Normale Supérieure de Lyon. Professeur associé, Membre Étranger de l'Institut Universitaire de France.

Sept. 1995 – . École Normale Supérieure de Lyon. Full Professeur.

Jan. 1998 – Dec. 2002. Deputy Director, Département des Sciences de la Matière (Chemistry and Physics), Ecole Normale Supérieure de Lyon.

Oct. 1999 – Dec. 2002. Director, Experimental Chemistry Laboratory, Ecole Normale Supérieure de Lyon.

Sept. 2002 – Sept. 2007. Member of the Institut Universitaire de France.

Jan. 2003. Project leader, nominated by the Ministry for Education and Research, European Center for High Field NMR in Lyon.

Mar. 2006 -. Director of the Chemistry Department, Ecole Normale Supérieure de Lyon.

Sept. 2007-. Honorary Member of the Institut Universitaire de France.

Jan. 2008 -. Scientific Director, Centre de RMN à Très Hauts Champs à Lyon.

Jun. 2009 – Sept. 2009. Visiting Professor, California Institute of Quantitative Biosciences, Univeristy of California, Berkeley.

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### **Awards and Honours**

1991. Fellow of the Miller Institute for Basic Research in Science, Berkeley, CA

1994. Foreign Member of the Institut Universitaire de France.

2002. Member of the Institut Universitaire de France.

2004. Gallileo Lecturer in Chemistry, Università di Pisa, Italy

2005. CNRS Silver Medal in Chemistry.

2009. EAS Award for Outstanding Achievement in Magnetic Resonance

## *Responsabilités Scientifiques Collectives*

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Editor, Magnetic Resonance in Chemistry (Wiley).

Member of the Editorial Board of "Solid-State NMR" (Elsevier).

Member of the Committee of the Groupement Ampère. [www.ampere.ethz.ch](http://www.ampere.ethz.ch)

Chair Elect, & Member of the Executive Committee of the Experimental NMR Conference (2003-, annual, 1000-1400 attendees, USA) [www.enc-conference.org](http://www.enc-conference.org)

Founding Organiser of the Alpine Conference on Solid-State NMR (1999-, bis-annual, limited to 250 attendees, Chamonix.) [www.alpine-conference.org](http://www.alpine-conference.org)

General Secretary of the International Society of Magnetic Resonance (ISMAR). (1998-2004) [www.ismar.org](http://www.ismar.org)

Member of the scientific committee of the European Experimental NMR Conference. (1996-2003, bis-annual, europe (400-800 attendees) [www.euromar.org](http://www.euromar.org)

Member of the Board of Trustees of the EUROMAR conference (annual, 800 attendees, Europe) [www.euromar.org](http://www.euromar.org) (2004-2008).

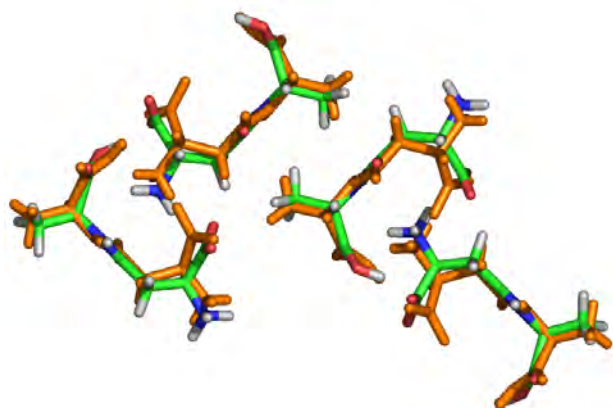
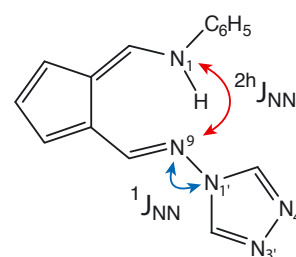
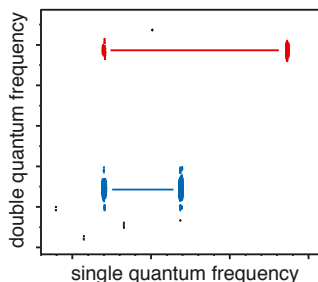
Member of the committee for the "*Le Monde*" prize for research

# Statement of Current Research Interests<sup>1</sup>

My research interests are developed at the Center for Very High Field NMR in Lyon, and are centered around the development of solid-state NMR spectroscopy, and its application to unsolved structural challenges in chemistry. The following is not an exhaustive summary, but rather a discussion of some of our most recent results, which we plan to continue to develop in the future.

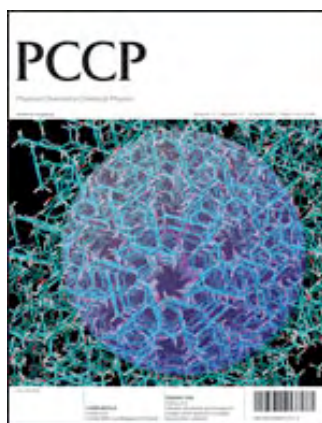
The development of **experimental techniques** concerns new methods to characterize complex molecules or materials in the solid-state, in terms of their formula, their three-dimensional structure, their dynamics or their reactivity.

Some recent examples involve the development of experimental methods which allow spectral **characterization of solids at natural isotopic abundance**, in a manner similar to liquid-state NMR, by methods such as spectral editing (P46, P65) or HMQC and HSQC type correlation spectra (P48, P61, P63, P107), which were previously unavailable for solids. We then went on to show how scalar couplings could be used to probe **weak bonding interactions** in solids. We provided the **first ever direct** detection of an **H-bond in the solid-state** (P75), as well as the first experimental demonstration that **agostic bonds** are present in surface complexes (P77). Continuing work in this area involves, for example: the quantification of H-bonding strengths (and scalar couplings in general) in solids (P79, P95, P115, P123, P137); the characterization of scalar couplings to measure the degree of conjugation in retinal derivatives in the **membrane protein** rhodopsin (P112); or the detection and measurement of long-range scalar couplings to provide structural information on torsion angles.



Other experimental developments concern for example the improvement of resolution and sensitivity of NMR. In this context we have notably developed new techniques allowing the obtention of **high-resolution <sup>1</sup>H spectra in solids** (P56, P66, P67, P85, P98, P99, P138). Again, this is something which was previously unavailable. This opens up the clear perspective of developing methods for three-dimensional **structure determination of organic materials or inorganic complexes** at natural isotopic abundance without the need for monocystals, thereby providing an alternative to diffraction methods, and setting the field for the development of **NMR Crystallography** (P105,

<sup>1</sup> note that the numbers in parenthesis refer to the publication list that can be found on <http://perso.ens-lyon.fr/lyndon.emsley>. More information is also available at [www.crmn-lyon.fr](http://www.crmn-lyon.fr)



P116, 129). Further developments to refine structures in this area include the use of advanced periodic DFT calculations (P111, P117, 125)

Also, our group has shown that high-resolution NMR spectra can be obtained from **disordered solids** (P84, P102, P115). Again, one of the areas where experimental methods are lacking for detailed structural studies. *This work was highlighted by Chemical and Engineering News in their "year in review" of major advances in chemistry for 2003.*

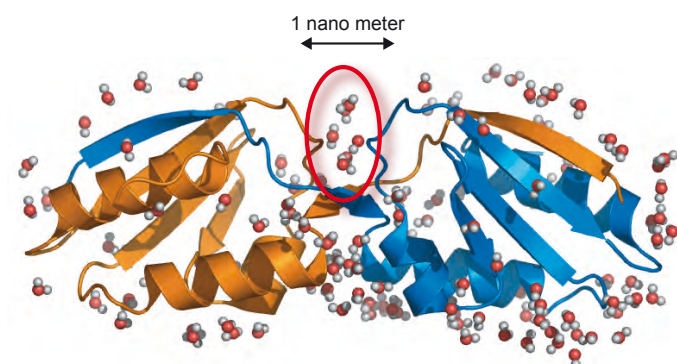
Potential areas of application which we are already developing being the study of disordered biomaterials, or **disordered inorganic framework silicates** (P115, P123, P137).



We are also active in the area of applying advanced solid-state NMR techniques to **complex molecular or materials problems**. In the following I will cite two of the most active and promising areas.

First, we have a long standing interest in probing the structural features of **solid biomaterials**.

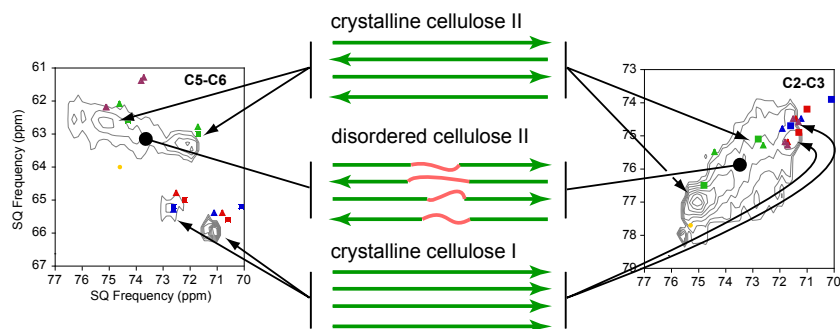
Our more recent work in this area, which we have been developing over the past five years, concerns the **structural characterization of proteins**. We have made great progress in this area very recently (P89, P90, P96, P106, P108, P112, P120, P121, P123, P124, P127, P139, P140) and were among the very first groups to use **micro-crystalline preparations** for solid-state NMR:



this is an extremely dynamic area for the future, with the perspective of complete structural and dynamic characterization of biologically relevant proteins. So far our work has concentrated on the characterisation of **water-protein interactions**, and methods for the **characterization protein dynamics** in the solid state. In very recent landmark work, we have shown that paramagnetic **metallo-enzymes** proteins can also be studied by solid-state NMR of microcrystalline samples (P124).

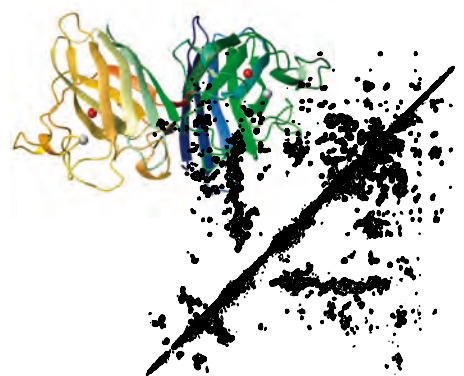
Our older work concerns the characterization **cellulosic materials** (P37, P53, P54, P76, P102, P115). These are extraordinarily complex, disordered materials. In a notable contribution (P53, P76) we were able to characterize the change in local molecular dynamics upon **hydration** of cell wall material, and subsequently to localize the water molecules inside the cellulose microfibrils. This study allowed us to discount one the most commonly used existing structural models.





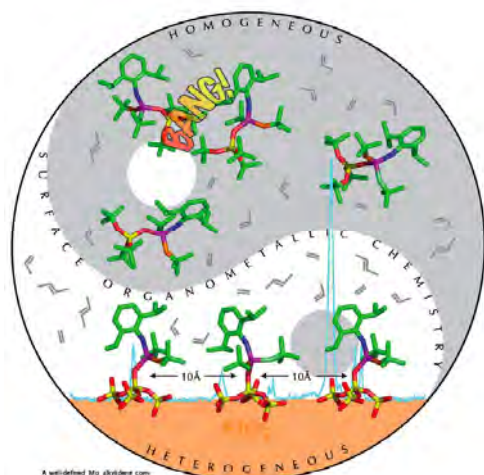
The other area of application I highlight here has been a body of work concerned with the **characterization of inorganic complexes in the solid state**.

One subject concerns the study of **paramagnetism** in different systems, such as 4Fe-4S (P62), high spin Fe(II) (P119), or Lanthanide containing complexes (P131). For example, by developing new NMR approaches we were able to provide a detailed characterization of a high spin Fe(II) catalyst (P119). Future work in this area focuses, for example, developing NMR methods specifically aimed at paramagnetic solids (P119, P126, P131)), and on studying paramagnetism in more difficult, catalytically relevant, systems (P119), lanthanide complexes relevant to the activity of MRI contrast agents, as well as studying paramagnetic centers in proteins (P124, P131).



## Communications

Angewandte  
Chemie  
DOI: 10.1002/anie.200507305



A well-defined Mo alkylidene complex immobilized on silica, fully characterized by solid-state NMR spectroscopy, leads to better performance in olefin metathesis than the corresponding noncovalently immobilized catalysts, probably because of the isolation of the active sites on a supported system, which prevents deactivation through dimerization. For more details, see the Communication by C. Copéret and co-workers on the following pages.

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Angew. Chem. Int. Ed. Engl. 45, 1216-1219

Another subject concerns the chemical and structural characterization of catalytically active **surface organometallic complexes**. We have shown how it is possible to use sophisticated multi-dimensional NMR techniques to **fully characterize catalytic species on silica surfaces**, and subsequently to obtain structural parameters related to their reactivity (P68, P71, P77, P80, P91, P97, P104, P110, P119, P125, P130, P134, P136, P141). In particular, in collaboration with Jean-Marie Basset and his group in Lyon, we have recently shown how a single tungsten atom on a silica surface can **activate molecular nitrogen** (P130), or how we can determine the **reaction intermediates in alkene metathesis** (P141). Once again, these are systems where other methods of characterization, especially diffraction methods, are seriously compromised, and structural characterization of these systems is extremely rare in the literature. This lack of characterization is one of the primary reasons why heterogeneous catalysis is still at a relatively primitive stage of development when compared to its homogeneous counterpart. The potential impact of NMR in this area of chemistry is huge.

Finally I should mention that very recently we have started to develop NMR methods aimed at solving **biomedical problems** by providing an analytical method to determine the metabolic changes associated with either disease on the one hand, or genetic variations on the other. Our first published work in this area introduced the idea of "**Whole Organism NMR**," where we used Magic Angle Spinning NMR to obtain high-resolution NMR spectra from populations of the animal model organism *C. elegans* (P133). We showed that this approach could be used to identify and

understand the metabolic consequences of genetic modifications. Future work will concentrate on understanding genetic modifications related to disease and disease treatment through Whole Organism NMR.

## Coworkers Around the World

In addition to industrial partners such as Bruker and the pharmaceutical industry, our work involves several collaborations at various moments with internationally renowned academic groups all over the world. For example, recent collaborators that have led to publications have included :

J.-M. Basset, C. Copéret (CPE-Lyon), B.F. Chmelka (UCSB), I. Bertini (Florence), M. Blackledge (Grenoble), A. Böckmann (IBCP Lyon), S.P. Brown (Warwick), M. Goldman (Paris), P.J. Grandinetti (Ohio-State) R.K. Harris (Durham, UK), M.H. Levitt (Southampton), D. Massiot (Orleans), E. Oldfield (Urbana), C.J. Pickard (St. Andrews), A. Pines (Berkeley), R.R. Schrock (MIT)....

## Teaching Interests

Most of my teaching interests have developed over the last nearly 15 years that I have spent at the Ecole Normale Supérieure de Lyon. The ENS-Lyon is one of France's foremost elite "Grands Ecoles," which form the spearhead of the french undergraduate university system. During that time I have taught both in the undergraduate program, as well as in the "Aggregation de Sciences Physiques (option Chimie)." I have taught courses dealing with general structural chemistry, as well as undergraduate courses in NMR spectroscopy.

Since 2006 I have been **Director of the Chemistry Department**, with a particular responsibility for new strategies for teaching, and for hiring new faculty. Under my direction, we have significantly increased student numbers in our chemistry program, and have opened a new "International Masters Program in Advanced Chemistry." We have revised our curriculum to give the undergraduate Chemistry program a much more practical and project oriented approach, with an emphasis on learning techniques in a research driven manner.

I am interested in teaching in most areas of chemistry (or physics), but would currently be particularly interested in teaching general first year chemistry, or general physical chemistry, or more specialized courses in spectroscopy, quantum mechanics, structural chemistry, and of course NMR spectroscopy.

# Publication List: Professor Lyndon Emsley

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## Articles

1. H. Oschkinat, D. Limat, L. Emsley and G. Bodenhausen, "Longitudinal Relaxation Pathways in Scalar-Coupled Systems," *J. Magn. Reson.* **81**, 13 (1989).
  2. L. Emsley and G. Bodenhausen, "Self-Refocusing Effect of 270° Gaussian Pulses. Applications to Selective Two-Dimensional Exchange Spectroscopy," *J. Magn. Reson.* **82**, 211 (1989).
  3. L. Emsley and G. Bodenhausen, "Self-Refocusing 270° Gaussian Pulses for Slice-Selection Without Gradient Reversal in Magnetic Resonance Imaging," *Magn. Reson. Med.* **10**, 273 (1989).
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  6. L. Emsley, P. Huber and G. Bodenhausen, "Unravelling Overlapping Multiplets in Two-Dimensional NMR Correlation Spectra by Selective Inversion of Coupling Partners," *Angew. Chim. Intl. Ed. Engl.* **29**, 517 (1990); *Angew. Chim.* **102**, 576 (1990).
  7. L. Emsley and G. Bodenhausen, "Phase Shifts Induced by Transient Bloch-Siegert Effects in NMR," *Chem. Phys. Lett.* **168**, 297 (1990).
  8. L. Emsley, I. Burghardt and G. Bodenhausen, "Double Selective Inversion in NMR and Multiple Quantum Effects in Coupled Spin Systems," *J. Magn. Reson.* **90**, 214 (1990).
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  10. L. Emsley and G. Bodenhausen, "On the Use of a Slice-Selective 270° Self-Refocusing Gaussian Pulse for Magnetic Resonance Imaging: Comments on the Note by D. M. Doddrell *et al.*," *Magn. Reson. Med.* **19**, 461 (1991).
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11. L. Emsley and G. Bodenhausen, "Selective Two-Dimensional NMR Experiments for Topological Filtration of Fragments of Coupling Networks," *J. Am. Chem. Soc.* **113**, 3309 (1991).
  12. L. Emsley, "Shaped Selective Pulses and their Applications in Nuclear Magnetic Resonance Spectroscopy and Imaging," Doctoral Thesis, Université de Lausanne (1991).
  13. B. Boulat, L. Emsley, N. Muller, G.-P. Corradin, J. L. Maryanski and G. Bodenhausen, "NMR Studies of an Oligoproline Containing Peptide Analog that Binds Specifically to the H-2K<sup>d</sup> Histocompatibility Molecule," *Biochem.* **30**, 9429 (1991).
  14. L. Emsley and G. Bodenhausen, "The Role of Selective Two-Dimensional NMR Correlation Methods in Supplementing Computer-Supported Multiplet Analysis by MARCO POLO," in *Computational Aspects of the Study of Biological Macromolecules by Nuclear Magnetic Resonance Spectroscopy*, Edited by J. C. Hoch *et al.*, Plenum Press, New York, 1991.
  15. L. Emsley and G. Bodenhausen, "Optimization of Shaped Selective Pulses for NMR Using a Quaternion Description of their Overall Propagators," *J. Magn. Reson.* **97**, 135 (1992).
  16. J. R. Sachleben, E. W. Wooten, L. Emsley, A. Pines, V. L. Colvin and A. P. Alivisatos, "NMR Studies of the Surface Structure and Dynamics of Semiconductor Nanocrystals," *Chem. Phys. Lett.* **198**, 431 (1992)
  17. L. Frydman, Y. K. Lee, L. Emsley, G. C. Chingas and A. Pines, "Variable-Angle-Spinning Three-Dimensional Solid State Exchange NMR," *J. Am. Chem. Soc.* **115**, 4825 (1993).
  18. L. Emsley, T. J. Dwyer, H. P. Spielmann and D. E. Wemmer, "Determination of DNA Conformational Features from Selective Two-Dimensional NMR Experiments," *J. Am. Chem. Soc.* **115**, 7765 (1993).
  19. R. G. Larsen, J. Shore, K. Schmidt-Rohr, L. Emsley, H. Long, M. Janicke, B. F. Chmelka and A. Pines, "NMR Study of Xenon Dynamics and Energetics in Zeolite-A," *Chem. Phys. Lett.* **214**, 220 (1993).
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22. P. Duvoulon, L. Emsley, P. Weber, R. A. Meuli, M. Decorps and G. Bodenhausen, "Methods for Reconstructing the Phase Sensitive Slice Profile in Magnetic Resonance Imaging," *Magn. Reson. Med.* **31**, 178 (1994).
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  31. A. Roscher, L. Emsley and C. Roby, "The Effect of Imperfect Saturation in Saturation Recovery  $T_1$  Measurements," *J. Magn. Reson. A* **118**, 108 (1996)
  32. J. R. Sachleben, S. Caldarelli and L. Emsley, "The Effect of Spin Decoupling on Line Shapes in Solid-State Nuclear Magnetic Resonance," *J. Chem. Phys.* **104**, 2518 (1996).
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- 160b. J.R. Lewandowski and L. Emsley, "Relaxation Studies of Solid Biopolymers" in Handbook on Biopolymers, eds R. K. Harris and R. Wasylishen, John Wiley: Chichester, in press (2010).
161. E. Salager, G.M. Day, R. Stein, C.J. Pickard, B. Elena and L. Emsley, "Powder Crystallography by Combined Crystal Structure Prediction and High-Resolution 1H Solid-State NMR," *J. Am. Chem. Soc.* **132**, 2564 (2010).
162. J.M. Griffin, B. Elena, J.R. Yates, T.N. Pham, F. Mauri, C.J. Pickard, A.M. Gil, A. Lesage, L. Emsley and S.P. Brown, "Solid-State NMR Spectroscopy of Saccharides: Complete 1H Resonance Assignment of  $\beta$ -Maltose from 1H-1H DQ-SQ CRAMPS and 1H (DQ-DUMBO)-13C (SQ) Refocused INEPT 2D Spectra and First-Principles GIPAW Calculations," *Phys. Chem. Chem. Phys.*, in press (2010).
163. B.J. Blaise, V. Navratil, C. Domange, L. Shintu, M.-E. Dumas, B. Elena, L. Emsley, and P. Toulhoat "Two-Dimensional Statistical Recoupling for the Identification of Metabolic Networks from NMR Spectroscopy," *submitted*.
164. I. Bertini, L. Emsley, M. Lelli, C. Luchinat, J. Mao, and G. Pintacuda "Ultra-Fast MAS High Field Solid-State NMR permits Extensive 13C and 1H Detection in Paramagnetic Metalloproteins," *J. Am. Chem. Soc.*, in press (2010).
165. J.-N. Dumez, M.C. Butler, E. Salager, B. Elena and L. Emsley, "Ab initio simulation of proton spin diffusion," *submitted*.
166. E. Barbet-Massin, S. Ricagno, J. Lewandowski, S. Giorgetti, V. Bellotti, M. Bolognesi, L. Emsley and G. Pintacuda "Fibrillar vs crystalline Full Length  $\beta$ -2-microglobulin Studied by High-Resolution Solid-State NMR Spectroscopy," *J. Am. Chem. Soc.*, in press (2010).
167. C. Pontoizeau, J.F. Fearnside, V. Navratil, C. Domange, J.-B. Cazier, C. Fernandez, P.J. Kaisaki, L. Emsley, P. Toulhoat, M.-T. Bihoreau, J.K. Nicholson, D. Gauguier, and M.-E. Dumas, "Metabolite-set enrichment analysis shows metabolic divergence in control inbred rat strain," *submitted*.
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168. A. Roussey, D. Gajan, T. K. Maishal, A. Mukerjee, L. Veyre, A. Lesage, L. Emsley, C. Copéret, and C. Thieuleux, "Highly ordered mesostructured material containing regularly distributed phenols along the channel pores of an inert silica surface," *submitted*.
169. C. Pontoizeau, T. Herrmann, P. Toulhoat, B. Elena, and L. Emsley, "Targeted Projection NMR Spectroscopy for Unambiguous Metabolic Profiling of Complex Mixtures," *submitted*.
170. R.K. Harris, P. Hodgkinson, V. Zorin, J.-N. Dumez, B. Elena, L. Emsley, E. Salager and R. Stein, "Computation and NMR crystallography of terbutaline sulfate," *submitted*.

## Patents

1. L. Emsley and G. Bodenhausen, "Verfahren zum Selektiven Anregen von NMR-Signalen," *PCT Patent Application No. P5382 (Spectrospin AG); and related applications*.
2. L. Emsley and G. Bodenhausen, "Gauss-Impuls-Kaskade," *PCT Patent Application No. P5532 (Spectrospin AG); and related applications*.
3. A. Lesage, D. Sakellariou, S. Steuernagel, and L. Emsley, "Carbon-Proton Chemical Shift Correlation in Solid-State NMR by Through-Bond Multiple-Quantum Spectroscopy," *German Patent Application No. 198 34 145.8-33, and related PCT applications*.
4. J. Baltisberger, S. Hediger, and L. Emsley, "Procédé d'imagerie multi-dimensionnelle par résonance magnétique en champ inhomogène," *French Patent Application, No. 0303868, (2003). PCT application 2004*.

## Invited Presentations

1. Ninth International Meeting on NMR Spectroscopy, Warwick, England, July 1989.
  2. NATO Advanced Research Workshop on Computational Aspects of the Study of Biological Macromolecules by NMR Spectroscopy, Il Ciocco, Italy, June 1990.
  3. Austrian Chemical Society, Linz, Austria, March 1991.
  4. 11<sup>th</sup> ISMAR Meeting, Vancouver, Canada, July 1992.
  5. XV International Conference on Magnetic Resonance in Biological Systems, Jerusalem, Israel, August 1992.
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6. International School of Physics "Enrico Fermi," Nuclear Magnetic Double Resonance, Varenna, Italy, October 1992.
  7. 34<sup>th</sup> Experimental NMR Conference, St. Louis, MI, 14-18 March 1993.
  8. 13<sup>ème</sup> GERM Colloquim, Giers, France, April 1993.
  9. VII<sup>ème</sup> Journée Grenoblois de la RMN, Université Joseph Fourier, Grenoble, June 1994.
  10. VI<sup>ème</sup> Réunion de Travail sur la Résonance Magnétique dans les Solides, Evieux, 23-26 October 1994.
  11. Centre de Recherche sur la Physique de Haute Température, Orleans, 16 February 1995.
  12. Dipartimento di Fisica, Università La Sapienza, Rome, 9 March 1995.
  13. National High Magnetic Field Laboratory, Tallahassee, FL, 20 March 1995.
  14. Department of Chemistry, Ohio State University, Columbus, OH, 22 March 1995.
  15. Francis Bitter National Magnet Laboratory, Massachusetts Institute of Technology, Boston, MA, 24 March 1995.
  16. Journées Thematiques ELF Atochem, "Etat de l'Art en Résonance Magnétique Nucléaire," Pau, 22 November 1995.
  17. Bruker Spectrospin, Weissembourg, 1 February 1996.
  18. La RMN: un outil pour la biologie II, Institut Pasteur, Paris, 5-7 February 1996.
  19. 13th European Experimental NMR Conference, Paris, 19-24 May, 1996.
  20. VII<sup>ème</sup> Réunion de Travail sur la Résonance Magnétique dans les Solides, Evieux, 21-24 October 1996.
  21. International Symposium on Advances in NMR, Linz, Austria, 18-19 February 1997.
  22. Ecole de Physique des Houches, Les Houches, France, May 1997.
  23. 7th Chianti Workshop on Magnetic Resonance, San Miniato, Italy, May 1997
  24. Rocky Mountain Conference on Analytical Chemistry, Denver, Colorado, August 1997.
  25. Inauguration de la Plate Forme Lyonnaise de RMN, Université Claude Bernard, Lyon, 1998.
  26. Les Conférences Bruker, Obernai, France, May 1998.
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27. Joint 29th Ampere - 13th ISMAR Meeting, Berlin, Germany, August 1998.
  28. 6ème Journée CRPF de Chimie, Castres, France, October 1998.
  29. 40<sup>th</sup> Experimental NMR Conference, Orlando, Florida, March 1999.
  30. Spin Choreography, Cambridge, England, April 1999.
  31. 19<sup>th</sup> GERM Colloquim, Aussois, France, May 1999.
  32. Gordon Conference on Magnetic Resonance, Hew Hampshire, June 1999.
  33. Franco-Italian Conference on Magnetic Resonance, La Londe les Maures, France, May 2000.
  34. 30<sup>th</sup> Congress Ampère on Magnetic Resonance and Related Phenomena, Lisbon, Portugal, July 2000.
  35. VIII<sup>ème</sup> Réunion de Travail sur la Résonance Magnétique dans les Solides, Eveux, France, October 2000.
  36. Department of Physical Chemistry, ETH Zürich, Switzerland, January 2001
  37. 15th International Royal Society Meeting on NMR Spectroscopy, Durham, England, July 2001.
  38. 14<sup>th</sup> ISMAR Meeting, Rhodes, Greece, August 2001.
  39. Institut de Chimie Moléculaire d'Orsay, France, January 2002.
  40. 43rd Experimental NMR Conference, Asilomar, California, April 2002.
  41. 10th Ampère NMR School, Zakopane, Poland, June 2002.
  42. International Symposium on NMR, Indian Institute of Sciences, Bangalore, India, February 2003
  43. 10th Chianti Workshop on Magnetic Resonance, San Miniato, Italy, May 2003.
  44. II Encontro Luso-Brasileiro de RMN, Sintra, Portugal, Sept. 2003.
  45. Société Vaudois de Sciences Naturelles, Lausanne, Suisse, December 2003.
  46. La RMN: un outil pour la biologie VI, Institut Pasteur, Paris, February 2004.
  47. 23<sup>rd</sup> GERM Colloquim, Bierville, France, May 2004.
  48. Dipartimento di Chimica, Università di Pisa, Italy, June 2004.
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49. Centro Europeo di Risonanza Magnetica, Firenze, Italy, June 2004.
  50. Festsymposium zur Inbetriebnahme des 900 MHz Spektrometer, Forschungsinstitut fuer Molekulare Pharmakologie (FMP), Berlin, July 2004.
  51. 15th ISMAR Conference, Ponte Vedra Beach, Florida, October 2004.
  52. Journées Exceptionnelles de l'Academie des Sciences, Lyon, Janvier 2004.
  53. 4th annual meeting of the Institut des Métaux en Biologie de Grenoble, Autrans, France, March 2004.
  54. Innauguration du plateforme RMN hauts champs d'Orléans, Orléans, Mars 2005.
  55. 46th Experimental NMR Conference, Providence, Rhode Island, April 2005.
  56. Gordon Conference on Magnetic Resonance, New London, Connecticut, June 2005.
  57. XXXV National Congress on NMR, Rome, Italy, September 2005
  58. 4th Alpine Conference on Solid-State NMR, Chamonix-Mont Blanc, France, September 2005.
  59. SMASH 2005 NMR Conference, Verona, Italy, September 2005.
  60. Institut Laue Langevin Annual Scientists Outgoing, Pralognan en Vanoise, France, October 2005.
  61. Departement de Chimie, Ecole Normale Supérieure, Paris, France, January 2006.
  62. Laboratoire de Chimie de Coordination, Toulouse, France, April 2006.
  63. 47th Experimental NMR Conference, Asilomar, California, April 2006.
  64. Frontiers of Biomolecular NMR-Inauguration of 800 MHz Spectrometer & Ten Years of Slovenian NMR centre, Ljubljana, Slovenia, June 2006
  65. EUROMAR 2006, York, England, July 2006
  66. XXII International Conference on Magnetic Resonance in Biological Systems, Göttingen, Germany, August 2006
  67. Gordon Conference on Computational Aspects of Biological NMR, Aussois, France, September 2006.
  68. Third Japanese-French Seminar on Structural Dynamics of Proteins, European Synchrotron Radiation Facility, France, January 2007.
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69. Annual User Meeting of the EU-NMR Large Scale Facilities for NMR, Florence, Italy, January 2007.
  70. Innauguration Symposium of the 800 MHz Spectrometer, EPFL Lausanne, Switzerland, January 2007.
  71. Journée Chimie-Biologie de l'université Paul Sabatier, Toulouse, France, May 2007.
  72. Department of Chemistry, University of Durham, England, May 2007.
  73. XI Chianti Workshop on Magnetic Resonance, Vallombrosa, Italy, June 2007.
  74. Symposium Antonio Xavier, Instituto de Tecnologia Química e Biológica, Lisbon, Portugal, July 2007.
  75. 49th Rocky Mountain Conference on Analytical Chemistry, Breckenridge, Colorado, August 2007.
  76. SFB 625 - International Discussion Meeting on the Molecular and Structural Basis of Functional Systems, Mainz, Germany, September 2007.
  77. Sanofi, Villefranche sur Soane, October 2007.
  78. 16th ISMAR conference, Kenting, Taiwan, October 2007.
  79. Royal Society of Chemistry Christmas Meeting, London, England, December 2007
  80. 2<sup>nd</sup> Annual User Meeting of the EU-NMR Large Scale Facilities for NMR, Frankfurt, Germany, January 2008
  81. Astra Zeneca, Gothenburg, Sweden, January 2008
  82. 49th Experimental NMR Conference, Asilomar, California, March 2008.
  83. Journées Soleil Région Centre, Orléans, France, March 2008.
  84. Sanofi Aventis Research & Development, Strasbourg, France, June 2008.
  85. Euromar 2008, St. Petersburg, Russia, July 2008.
  86. 33rd FEBS Congress, Athens, Greece, July 2008.
  87. 10th Central European NMR Symposium, Zagreb, Croatia, September 2008.
  88. 3rd Meeting on Internal Mobility in Biomolecules, Paris, France, October 2008.
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89. Challenging Biological Systems by NMR Spectroscopy, Berlin, Germany, October 2008.
  90. 47th Annual Meeting of the NMR Society of Japan, Tsukuba, Japan, November 2008.
  91. Département de Chimie, Université de Aix-Marseille, Janvier 2009.
  92. 3<sup>rd</sup> Annual User Meeting of the EU-NMR Large Scale Facilities for NMR, Autrans, France, January 2009
  93. Journées Académique Enseignement Recherche, Académie de Lyon, Lyon, February 2009. (Lecture to High-School Teachers)
  94. Pfizer Global R&D Center, Groton, CT, February 2009.
  95. Department of Chemistry, University of Geneva, April 2009.
  96. International Symposium « Solid-State NMR, Better Resolution, Higher Sensitivity and Novel Applications, » Rehovot, Israel, May 2009
  97. Gordon Conference on Magnetic Resonance, Beddeford, Maine, June 2009.
  98. Department of Chemistry, University of California, Irvine, August 2009.
  99. Department of Chemistry, University of California, Riverside, August 2009.
  100. Eastern Analytical Symposium, Somerset, New Jersey, November 2009.
  101. Royal Society of Chemistry, « Structure 2010 », Hinckley, February 2010.
  102. Formavie 2010, Lyon, March 2010. (Lecture to High-School Teachers)
  103. 51st Experimental NMR Conference, Daytona Beach, Florida, April 2010.
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