

Curriculum Vitae

Dr. Sachin R. Chaudhari
Scientist,
Department of Spice and Flavour Science,
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Research Interests

Methods development in solution and solid state NMR and their applications to the food science world. The goals of my research are to highlight advances in NMR spectroscopy and provide insight into how new methods can be deployed to address a number of important measurement challenges and study a range of food materials and pharmaceuticals both a solution- and solid-state NMR perspectives.

Education

Degree	Subject	University/Institution	Duration
Ph.D.	Chemistry (NMR Spectroscopy)	NMR Research Centre, Indian Institute of Science, Bangalore, India.	2009 – 2014
M.Sc.	Chemistry	Department of Chemistry, Nagpur University, Maharashtra, India.	2006 – 2008
B.Sc.	Phy, Chem, Maths	Sardar Patel College, Chandrapur, Nagpur University, Maharashtra, India.	2003 - 2006

Current Position

Scientist, Department of Spice and Flavour Science, CSIR-Central for Food Science and Technological Institute, Mysore, India.

Previous Position

1. Research Associate, NMR Research Centre, Indian Institute of Science, Bangalore, India, January-2014-August-2014, under the guidance of Prof. N. Suryaprakash.
2. Post-doctoral Fellow, Centre de RMN Très Hauts Champs, Université de Lyon (CNRS/ENS Lyon/UCB Lyon 1) 69100 Villeurbanne, France, September-2014 to August-2016, in the group of Prof. Lyndon Emsley and Dr Anne Lesage.
3. Post-doctoral Fellow, Laboratory of Magnetic Resonance and Modeling and Exploration of Materials, INAC, CEA and Grenoble Alpes University, 17, rue des Martyrs, Grenoble, France, September-2016 to April-2017 in the group of Dr. Gael De Paepe.
4. Marie Skłodowska-Curie Fellow, School of Chemistry, University of Nottingham, University Park, Nottingham, NG7 2RD, UK, 2017-2018, in the group of Prof. Jeremy Titman.

Fellowship and Academic Achievements

1. Qualified the Council of Scientific and Industrial Research- National Eligibility Test (CSIR-NET), India for Junior Research Fellowship and Eligibility for Lectureship, June-2009.

2. Qualified the Maharashtra State Eligibility Test (MH-SET), India for Assistant Professorship Conducted by University of Pune as a State agency, Maharashtra, India, **2009**.
3. Qualified the GATE (Graduate Aptitude Test of Engineering, India) in **2010**.
4. Awarded CBMR-NMRS Gold Medal award for Excellence in Research in India (National Level) in the field of NMR Spectroscopy for the Year-**2012**.
5. Awarded the Jharana Rani Samuel, Best Student Award for Excellence in Research in India (National Level) in the field of NMR Spectroscopy for the Year-**2013**.
6. Awarded CBMR-NMRS Gold Medal award for Excellence in Research in India (National Level) in the field of NMR Spectroscopy for the Year-**2014**.
7. Selected **Marie-Curie Individual Fellowship** for postdoctoral research funding from the Marie-Sklodowska-Curie Actions-**2016**.

Teaching and Guidance

April 2010-August 2010: Supervised one graduate student.

April 2012-August 2012: Supervised two M.Sc. students.

April 2013-August 2013: Supervised one post graduate (M.Pharm.) student and junior college lecture.

April 2014-August 2014: Supervised three M.Sc. and two under graduate students.

August-2017-December-2017: Supervised two Master Students

Feb-2017-till Date: Supervising two Dissertation Students

Presentations at Conferences and Symposia

1. Poster presented at the 17th Annual NMRS (National Magnetic Resonance Society) symposium, Guru Nanak Dev University, Amritsar, India, **2011**.
2. Attended workshop on Recent Advances in NMR Spectroscopy, organised by Tata Institute of Fundamental Research (TIFR), Hyderabad, India, **2011**.
3. Oral presentation at the Indo-Swiss Symposium on Recent Trends in NMR of Biomolecules and Advanced Materials, NCL (National Chemical Laboratory), Pune, India, **2012**.
4. Poster presented at the 18th Annual NMRS (National Magnetic Resonance Society) symposium, Indian Institute of Science, Bangalore, India **2012**.
5. Poster presented at the International conference EUROMAR-2012 (European Magnetic Society) held at the University of Dublin, Dublin, Ireland, **2012**.
6. Oral presentation at the 19th Annual NMRS (National Magnetic Resonance Society) Symposium, organised by TIFR and Indian Institute of Chemical Technology, Mumbai, India, **2013**.
7. Poster presented at the 19th Annual NMRS (National Magnetic Resonance Society) Symposium, Organised by TIFR and Indian Institute of Chemical Technology, Mumbai, India **2013**.
8. Poster presented at SMASH-2013 (Small molecule NMR conference) at Santiago de Compostela, Spain, **2013**.
9. Attended workshop on the Ultrafast NMR held at the Santiago de Compostela, Spain, **2013**.
10. Oral Presentation at the NCC-2013 (National Conference on Chirality), Symposium, organised by M. S. University of Baroda, Baroda, India, **2013**.
11. Invited guest lecture at the Government Science college for Women, Hindupur, Andhra Pradesh, India, December-**2013**.
12. Oral presentation at the 20th Annual NMRS (National Magnetic Resonance Society) symposium, organised by Tezpur University, Tezpur, India, **2014**.
13. Oral presentation at the 21th Annual NMRS (National Magnetic Resonance Society) symposium, organised by Guru Nanak Dev University, India, **2015**.
14. Poster presented at the Eu-Cost Summer School On Nuclear Spin Hyperpolarization Techniques, organised by University of Southampton, UK and Goethe University Frankfurt, Southampton, UK, **2015**.
15. Poster presented at 9th the Alpine Conference on Solid State, NMR, organised under the auspices of the groupement Ampere and the International Society of Magnetic Resonance, Chamonix-Mont Blanc, France, **2015**.
16. Poster presented at 58th Annual Rocky Mountain Conference on Magnetic Resonance in Breckenridge, Colorado which endorsed by American Chemical and Applied Spectroscopy Society, **2016**.

17. Presented talk on Dynamic Nuclear Polarization under fast magic angle spinning conference 7th Asia Pacific NMR Conference (APNMR-2017) held in IISc, Bangalore, **2017**.
18. Presented talk on solvent suppression in MAS DNP meeting at Catalyst design by NMR, Lille, France, March-**2017**.

Invited Talks

1. Delivered talk at Mahatma Gandhi Senior Science College, Nagbhid, Maharashtra, India, **2014** under Inspire programme to graduate/postgraduate students.
2. Delivered talk at Nevajabai Hitkarni Senior Science College, Bramhapuri, Maharashtra, India, **2016**, under Inspire programme to graduate/postgraduate students.
3. Delivered tutorial lectures at the workshop on solid state NMR for materials and biomolecules organised by Institute of Organic Chemistry, Riga, Latvia, **2016**.
4. Delivered talk at Indian Institute of Science and Education Research, Mohali, Punjab, India. 21st August, **2016** on DNP Enhanced solid state NMR: The development and applications.
5. Departmental Seminar, (On Developments and Applications of New Methods for solution NMR & DNP Enhanced solid State NMR), IIT, Roorkee, August-24-**2016**.
6. Departmental Seminar, (On Developments and Applications of New Methods for solution NMR & DNP Enhanced solid State NMR), IIT, Ropar, August-29-**2016**.
7. Departmental Seminar, (On Developments and Applications of New Methods for solution NMR & DNP Enhanced solid State NMR), IIT, Mumbai, September-2-**2016**.
8. Departmental Seminar, (On Developments and Applications of New Methods for solution NMR & DNP Enhanced solid State NMR), IIT, Patna, Jan-2-**2017**.
9. Departmental Seminar, (On Developments and Applications of New Methods for solution NMR & DNP Enhanced solid State NMR), IIT, Bhubaneswar, Feb-10-**2017**.
10. Delivered talk at Sardar Patel Mahavidyalaya, Chandrapur, Maharashtra, India, **2017**, under Inspire programme to graduate/postgraduate students by Alumni.
11. Invited talk in the conference 7th Asia Pacific NMR Conference (APNMR-2017) held in IISc, Bangalore, **2017**.
12. Invited talk in the conference 5th Annual Conference of AnalytiX **2017** (AnalytiX-2017) Fukuoka, Japan, **2017**.
13. Invited talk in the 6th Annual World Congress of Advanced Materials-**2017** (WCAM-2017, Xi'an) Xi'an China, **2017**.
14. Invited Chair/Speakers in the 8th World Gene Convention-2017, Macao, China during November 13-15, **2017**.
15. Oral Speech Invited in the 15th Annual Congress of International Drug Discovery Science and Technology - Japan **2017** (IDDST-Japan 2017) held during July 25-27, **2017** in the city of Osaka in Japan.
16. Departmental Seminar, (On Developments and Applications of New Methods for solution NMR & DNP Enhanced solid State NMR), IIT, Indore, August-08-**2017**.
17. Oral presentation at IUPAC-**2017**, held at Hyderabad, India.

Membership in Scientific Societies

Life member, National Magnetic Resonance Society of India, India.

Qualifications and Experience of the Supervisor

Sachin Chaudhari (SC) is currently Scientist in Magnetic Resonance in the department of spice and flavour science at CSIR-CFTRI, Mysore and Assistance professor in AcSIR(Academy of Scientific and innovative research). SC's research career started at the internationally-acclaimed Indian Institute of Science in Bangalore. Since commencing my PhD there in 2009 I have clearly showed the potential to become a mature and independent researcher. Worked as a Marie Curie Research Fellow, at University of Nottingham, UK. Prior to that experience, worked as a Postdoctoral Fellow at the High Field NMR Center of Lyon, under the supervision of Prof. Lyndon Emsley and Dr Anne Lesage for 2 years and at the CEA, INAC and University Grenoble Alpes, INAC, F-38000 Grenoble, France under the supervision of Prof. Gael De Paepe and research associate at IISc, India for 6 and 8 months respectively (experienced letter attached). In particular During over 10 years of research activity, SC has developed a large number of important new methods in solution and solid-state NMR and related techniques. My outstanding research to date (for detailed publication list) has resulted in 36 peer-reviewed publications, including many in high-impact journals (e.g. *J. Am. Chem. Soc.*, *Angew. Chem. Int. Ad*, *J. Org. Chem*, *J Phys. Chem.*, *Phys. Chem. Chem. Phys.* and *Chem. Comm.*). Examples include advances in scalar correlation experiments, high-field DNP and high temperature, sequences for measuring proton-proton and heteronuclear coupling and DNP with ultrafast MAS, and development of 1.3 prototype for ultrafast DNP at low temperature for studying biomolecules and on the implementation of DNP at fast magic angle spinning. In addition to methodological developments, SC has applied solution and solid-state NMR to a broad range of problems in chemistry and materials science, including studies of the electronic structure of conducting polymers, chain folding and morphology in proteins, interfacial interactions in nanocomposite materials, catalyst structure, chiral discriminations' and their quantifications, and supramolecular and host guest interactions. SC plays a central role in directing the CFTRI's NMR Facilities and has an extensive network of contacts and collaborators within CFTRI, UK (Prof. Jeremy Titman, University of Nottingham), US (Dr. Santosh Margapalli, Temple university), IIT-Bhilai, IISc, Bangalore NMR and materials science, modern chemistry in industry and academia. In 2017, SC was also awarded prestigious Marie Curies Skłodowska-Curie Fellow by European Grant HORIZON-2020. In addition, He was also awarded with CBMR-NMRS Gold Medal award for Excellence in Research in India (National Level) in the field of NMR Spectroscopy for the Year-2012 and 2014 originally awarded by National Magnetic Resonance Society (NMRS) of India and Jharana Rani Samuel, Best Student Award for Excellence in Research in India (National Level) in the field of NMR Spectroscopy for the Year-2013 by NMRS community. Finally, SC has longstanding experience of research supervision during past carrier where he assisted with the supervision of several undergraduate and junior postgraduate students, training them in DNP and NMR, monitoring their progress and offering insight and advice in the face of problems. He helped to organize the 2012 Indian NMR Society conference in 2012 and an international workshop on solid-state NMR in Riga, Latvia. In addition, SC has delivered several invited and contributed research lectures at national conferences (Indian NMR Society Symposium and Indian National Conference on Chirality) and a bilateral symposium (Indo-Swiss Symposium on Recent Trends in NMR, Pune), as well as a tutorial lecture on DNP at an international workshop (Riga, Latvia). Finally, SC has delivered number of invited talks in several IITs and distinguish national and international conferences also carrier development programme for Graduate and undergraduate students.

Research Publications

1. Uday R. Prabhu, **Sachin R. Chaudhari**, N. Suryaprakash, Visualization of Enantiomers and Determination of Homo- and Hetero-nuclear Residual Dipolar and Scalar couplings: The natural Abundant ^{13}C edited J/D-resolved NMR Techniques, *Chem. Phy. Lett.*, **2010**, 500, 334-341.
2. **Sachin R. Chaudhari**, N. Suryaprakash, Three-Component Chiral Derivatizing Protocols for NMR Spectroscopic Enantiodiscrimination of Hydroxy Acids and Primary Amines, *J. Org. Chem.*, **2012**, 77, 648–651.
3. **Sachin R. Chaudhari**, N. Suryaprakash, Diffusion Ordered Spectroscopy for Resolution of Double bonded cis, trans-isomers, *J. Mol. Struct.*, **2012**, 1017, 106–108.
4. **Sachin R. Chaudhari**, N. Suryaprakash, Probing Acid-Amide Hydrogen Bonding by NMR Spectroscopy and DFT calculation, *J. Mol. Struct.*, **2012**, 1016, 163–168.
5. **Sachin R. Chaudhari**, Srinivasa, N. Suryaprakash, A Versatile Resolving Agent for Diffusion Edited Separation of Enantiomers, Complex Mixtures and Constitutional Isomers, *RSC Adv.*, **2012**, 2, 8689-8692.
6. **Sachin R. Chaudhari**, N. Suryaprakash, Simple and Efficient Methods for Discrimination of Chiral Diacids and Chiral alpha-Methyl Amines, *Org. Biomol. Chem.*, **2012**, 10, 6410-6419.
7. **Sachin R. Chaudhari**, N. Nath, N. Suryaprakash, C-HETSERF: Distinction of Cis/Trans-isomers and Measurement of Long Range Couplings between Chemically Equivalent Nuclei in Polycyclic Aromatic Hydrocarbons, *RSC Adv.*, **2012**, 2, 12915-12921.
8. **Sachin R. Chaudhari**, Srinivasa, N. Suryaprakash, Cyclodextrin and its Complexation for Resolution of Isomers Using Diffusion Ordered Spectroscopy, *J. Mol. Struct.*, **2013**, 1033, 75 -78.
9. **Sachin R. Chaudhari**, N. Suryaprakash, Chiral Discrimination and the Measurement of Enantiomeric Excess from a Severely Overcrowded NMR Spectrum, *Chem. Phy. Lett.*, **2013**, 555, 256-290.
10. **Sachin R. Chaudhari**, Santosh Mogurampelly, N. Suryaprakash, Engagement of CF_3 Group in $\text{N}\cdots\text{H}\cdots\text{F}\cdots\text{C}$ Hydrogen Bond in the Solution State: NMR Spectroscopy, DFT and MD Simulation Studies, *J. Phy. Chem. B.*, **2013**, 117, 1123-1129.
11. **Sachin R. Chaudhari**, N. Suryaprakash, Ternary ion-pair Complexation: A Strategy for Chiral Discrimination and the Assignment of Absolute Configuration of Chiral Carboxylic Acid, *New J. Chem.*, **2013**, 37, 4025-4030.
12. Sandeep Mishra, **Sachin R. Chaudhari**, N. Suryaprakash, *In Situ* Approach for Testing the Enantiopurity of Chiral Amines and Amino Alcohols by ^1H NMR, *Org. Biomol. Chem.*, **2013**, 12, 495-502.
13. **Sachin R. Chaudhari**, N. Suryaprakash, Facile Protocol for Configurational Assignments of Primary Amine and Hydroxy acid, *New J. Chem.*, **2013**, 37, 4025-4030.
14. Lokesh, **Sachin R. Chaudhari**, N. Suryaprakash RES-TOCSY: A Simple Approach to Resolve Overlapped ^1H NMR Spectra of Enantiomers, *Org. Biomol. Chem.*, **2014**, 12, 993-997.
15. **Sachin R. Chaudhari** and N. Suryaprakash Pure Shift NMR Approach for Fast and Accurate Extraction of Heteronuclear Couplings, *RSC Adv.*, **2014**, 4, 15018-15021.
16. Karel D. Klika, Sandeep Kumar Mishra, **Sachin R. Chaudhari**, N. Suryaprakash, The three-Component Protocol for the Enantiodifferentiation of Amines using Triphenyl Borate and BINOL: Is it an Ion Pair or an Amine-Coordinated Complex?, *Tetrahedron : Asymmetry*, **2014**, 25, 705–708.
17. Lokesh, **Sachin R. Chaudhari**, N. Suryaprakash, RES-TOCSY: A Facile Approach for Accurate Determination of Magnitudes, and Relative Signs of $^nJ_{\text{HF}}$, *Chem. Phys. Letts.*, **2014**, 602, 40-44.

18. Indrani Pal, **Sachin R. Chaudhari**, N. Suryaprakash, A Versatile Ternion for Chiral Discrimination of Molecules of Diverse Functionality Using ^1H NMR, *New J. Chem.*, **2014**, 38, 4908-4912.
19. **Sachin R. Chaudhari**, N. Suryaprakash, Recent NMR Methodological Developments for Chiral Analysis in Isotropic Solutions, *J. Ind. Inst. Sci.*, **2014**, 94, 485-516.
20. N. Lokesh, **Sachin R. Chaudhari** and N. Suryaprakash, Quick Re-introduction of Selective Scalar Interactions in Pure-Shift NMR Spectrum, *Chem. Comm.*, **2014**, 50, 15597-15600.
21. Indrani Pal, **Sachin R. Chaudhari**, N. Suryaprakash, Chiral Discrimination of Secondary Alcohols and Carboxylic Acids by NMR Spectroscopy, *Magn. Reson. Chem.*, **2015**, 53, 142-146.
22. **Sachin R. Chaudhari** and N. Suryaprakash, J-Edited Pure Shift NMR for the Facile Extraction of the $^nJ_{\text{HH}}$ to a Specific Proton, *ChemPhyChem*, **2015**, 16, 1079-1082.
23. A. Lakshmipriyaa, **Sachin R. Chaudhari**, Abhishek Shahi, E. Arunan and N. Suryaprakash, Three Centered Hydrogen Bond of the type C=OH (N)X-C in diphenyloxamide derivatives involving halogens and a rotating CF_3 group: NMR, QAIM, NCI and NBO Studies, *Phys. Chem. Chem. Phys.*, **2015**, 17, 7528-7536.
24. **Sachin R. Chaudhari**, Screening and Assignment of Phenylboronic Acid and its Anhydride Formation by NMR Spectroscopy, *Chem. Phys. Letts.*, **2015**, 634, 95-97.
25. A. Lakshmipriyaa, **Sachin R. Chaudhari**, and N. Suryaprakash, Enantio-differentiation of Molecules with Diverse Functionalities by a Single Probe, *Chem. Comm.*, **2015**, 51, 13492-13495.
26. M. Lelli, **Sachin R. Chaudhari**, D. Gajan, G. Casano, A. Rossini, O. Ouari, P. Tordo, A. Lesage and L. Emsley, Solid-State Dynamic Nuclear Polarization at 9.4 and 18.8 T from 100 K to Room Temperature, *J. Am. Chem. Soc.*, **2015**, 137, 14558-14561.
27. **Sachin R. Chaudhari**, P. Berruyer, D. Gajan, C. Reiter, F. Engelke, D. Silverio, C. Copéret, M. Lelli, A. Lesage, L. Emsley, Dynamic Nuclear Polarization at 40 kHz Magic Angle Spinning, *Phys. Chem. Chem. Phys.*, **2016**, 18, 10616-10622.
28. A. Lakshmipriyaa, **Sachin R. Chaudhari**, and N. Suryaprakash, P-Toluene Sulphonic acid Promotes the 2'-amino-[1, 1'-binaphthalene]-2-ol as a Chiral Solvating Agent, *New J. Chem.*, **2016**, 40, 8118-8122.
29. S. K. Mishra@, **Sachin R. Chaudhari**@, A. Lakshmipriya, I. Pal, N. Lokesh and N. Suryaprakash, Novel Synthetic As Well As Natural Auxiliaries With a Blend of NMR Methodological Developments for Chiral Analysis in Isotropic Media. In Graham A. Webb, editor: Annual Reports on NMR Spectroscopy, ARNMR, UK: Academic Press, **2017**, 91, 143-292. (@ equal contribution).
30. **Sachin R. Chaudhari**, J. M. Griffin, K. Broch, A. Lesage, C. P. Grey, H. Siringhaus, L. Emsley, Donor-Acceptor Stacking Arrangements in Bulk and Thin-Film High-Mobility Conjugated Polymers Characterized using MAS and Surface-Enhanced Solid-State NMR Spectroscopy, *Chem. Sci.*, **2017**, 8, 3126-3136.
31. J. Reddy Yarava, **Sachin R. Chaudhari**, A. J. Rossini, A. Lesage, and L. Emsley, Solvent suppression in DNP-Enhanced solid state NMR, *J. Magn. Reson.*, **2017**, 277, 149-153.
32. D. Lee, **Sachin R. Chaudhari**, and G. De Paepe, Spectral editing for Solvent suppression in DNP-Enhanced solid state NMR, *J. Magn. Reson.* **2017**, 278, 60-66.
33. D. Silverio; Ta-C. Ong; M. Baudin; M. Yulikov; L. Veyre; P. Berruyer; **Sachin R. Chaudhari**; D. Gajan, D Baudouin; B. Vuichoud; M. Cavallès; A. Bornet; G. Jeschke; G. Bodenhausen; A. Lesage; L. Emsley; S. Jannin; C. Thieuleux; C. Copéret, Tailored Polarizing Hybrid Solids with Nitroxide Radicals Localized in Mesoporous Silica Walls, *Helv. Chim. Acta.* **2017**, doi:10.1002/hlca.201700101.
34. **Sachin R. Chaudhari**, Dorothea Wisser, David Gajan, Moreno Lelli, Anne Lesage, Lyndon



Emsley, Dynamic Nuclear Polarization Efficiency Increased by Very Fast Magic Angle Spinning, **2017**, *J. Am. Chem. Soc.*, **139**, 10609–10612.

35. K. Jaudzems, L. B. Andreas, J. Stanek, **Sachin R. Chaudhari**, D. Lalli, Andrea Bertarello, T. Le Marchand, D. Cala-De Paepe, S. Kotelovica, I. Akopjana, L. Emsley, K. Tars, T. Herrmann, A. Lesage, G. Pintacuda, Dynamic nuclear polarization enhanced biomolecular NMR spectroscopy at high magnetic field with fast magic-angle spinning, *Angew. Chem., Int. Ed.* **2018**, <https://doi.org/10.1002/anie.201801016>, *In press*.
36. N. Nath, **Sachin R. Chaudhari**, Old and new insights in chiral discrimination by NMR spectroscopy, *In press Magn. Reson. Chem.* **2018**, doi: 10.1002/mrc.4719., *In press*.
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