

## BHAWNA CHAUBEY, Ph.D.

Postdoctoral Scholar  
Department of Chemistry  
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### RESEARCH INTERESTS

Applications of advanced Solution state Nuclear Magnetic Resonance (NMR) methods and other spectroscopic/ biophysical techniques to characterize structure and dynamics of macromolecules (i.e., nucleic acids, proteins etc.); macromolecules-small molecule interactions; drug discovery; chemical exchange; ODNP (Overhauser Dynamic Nuclear Polarization).

### EDUCATIONAL QUALIFICATIONS

Class	Year	University/Board	School/Institute	% Marks / CGPA
X	2008	Central Board of Secondary Education	Lovely Rose Secondary Public School, New Delhi	84
XII (PCMB)	2010	Central Board of Secondary Education	Guru Harkrishan Public School, New Delhi	80
B.Sc. Hons. (Chemistry)	2013	University of Delhi	Daulat Ram College, India	73.22
M.Sc. (Chemistry)	2015	Jamia Millia Islamia	Jamia Millia Islamia, India	8.62/ 10
PhD (Chemistry)	2021	Indian Institute of Technology Jodhpur	Indian Institute of Technology Jodhpur, India	8.5/ 10

### CURRENT RESEARCH POSITION

**Postdoctoral Scholar** in Varani Lab at Department of Chemistry, **University of Washington, Seattle**: - **April 2021-Present**  
Working on 'Structural and dynamical characterization of microRNA, flaviviruses and their interaction with small molecules employing multidimensional NMR methods' under the supervision of Prof. Gabriele Varani.

### PAST RESEARCH EXPERIENCE

#### IIT Jodhpur, India

PhD, Chemistry

**Aug 2015- March 2021**

Thesis Title: 'Solution State  $^{19}\text{F}$  Magnetic Resonance (MR) Account of Molecular Interactions in Solutions' supervised by Dr. Samanwita Pal

#### Jamia Millia Islamia, New Delhi

**2014- 2015**

M.Sc., Chemistry (Project Thesis)

Thesis Title: 'Removal of Ni (II) from Aqueous Solution onto chitosan/TTP/CMC Composite: Equilibrium, Dynamics and Kinetics studies' supervised by Dr. Rahisuddin

### ANALYTICAL/ TECHNICAL SKILLS

#### Instruments:

- Bruker Ascend 500, 600 and 800 MHz WB NMR spectrometer with BBFO/ Solid State/TCI and cryo-probe.
- Can switch NMR probes from liquid to solid and vice versa and know cryogen filling
- UV-Vis Spectrophotometer: Agilent Varian Cary 4000.
- FT-IR Spectrometer: VERTEX 70v Vacuum Bruker.
- Fluorescence Spectrophotometer: LS 55 Perkin-Elmer.
- Circular Dichroism (J-815): JASCO.
- Powder X-Ray Diffraction (XRD): D8 Advance, Bruker.
- Cyclic Voltammetry and HPLC

**Softwares:** Bruker NMR TopSpin, Sparky, CCPNMR, PyMOL, Chimera, Windows, MS Office, Origin, ChemDraw, Coral Draw, MATLAB, MATHEMATICA, Mendeley, EndNote, Linux.

## TEACHING EXPERIENCE

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➤ **Teaching Assistant** at IIT Jodhpur from July 2015-July 2020 in the subjects:

- Principle of Nuclear Magnetic Resonance (CY752)
- M.Sc. Physical Chemistry Lab (CY513)
- M.Sc. Organic Chemistry Lab (CY511)
- B. Tech General Chemistry Theory and Lab (CY211)
- Physical Chemistry Laboratory (CYP6040)
- Instrumentation Hands on

## PUBLICATIONS

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### Journal Articles:

- M. D. Shortridge, **B. Chaubey et al.** Drug-like small molecules that inhibit expression of the oncogenic microRNA-21. *ACS Chemical Biology*, **2022**. (Just accepted with minor revisions, also available at bioRxiv 2022.04.30.490150; doi: <https://doi.org/10.1101/2022.04.30.490150>)
- **Chaubey, B.**, Chandrakumar, N. & Pal, S. Preferential solvation of carbohydrates in water-trifluoroethanol mixtures: A solvent detected heteronuclear NMR approach. *Communication in Physical Chemistry Chemical Physics*, **23**, **2021**, 14564-14568.
- **Chaubey, B.**, Narawal, P., Khandelwal, A. & Pal, S. Aqueous photo-degradation of Flupyradifurone (FPD) in presence of a natural Humic Acid (HA): A quantitative solution state NMR analysis. *Photochemistry and Photobiology A: Chemistry*, **405** (2021), **2021**, 112986.
- **Chaubey, B.**, Singh, P. & Pal, S. Solution State NMR evaluation of molecular interaction between monoaromatic Carboxylic Acids and dissolved Humic Acid. *Environment Science and Pollution Research*, **28**, **2021**, 17775–17788.
- **Chaubey, B.**, Dey, A., Banerjee, A., Chandrakumar, N. & Pal, S. Assessment of the role of TFE solvent dynamics in inducing conformational transitions in MLT: An approach with solvent <sup>19</sup>F low field NMR relaxation & ODNP studies. *Journal of Physical Chemistry B.*, **124** (28), **2020**, 5993–6003.
- **Chaubey, B.**, & **Pal, S.** Binding Interaction of Organofluorine–Serum Albumin: A Comparative Ligand-Detected <sup>19</sup>F NMR Analysis. *Journal of Physical Chemistry B.* **122**(40), **2018**, 9409–9418.
- Vandana, **Chaubey, B.**, Dhaharwal, A. K., & **Pal, S.** Solvent-dependent binding interactions of the organophosphate pesticide, chlorpyrifos (CPF), and its metabolite, 3,5,6- trichloro-2-pyridinol (TCPy), with Bovine Serum Albumin (BSA): A comparative fluorescence quenching analysis. *Pesticide Biochemistry and Physiology*, **139**, **2017**, 92-100.
- Padmapriya, S., Harinipriya, S., Sudha, V., Kumar, D., **Pal, S.**, & **Chaubey, B.** Polyaniline coated copper for hydrogen storage and evolution in alkaline medium. *International Journal of Hydrogen Energy*. **42**(32), **2017**, 20453-20462.

### Conference papers:

- **Chaubey, B.**, & **Pal, S.** Hexaflumuron  $\beta$ -Cyclodextrin Inclusion Complex as Improved Pesticide Formulation: A NMR Case Study. *AIP Conference Proceedings*. **2142**, **2019**, 180003(1)- 180003(4).

## CONFERENCES/ WORKSHOPS ATTENDED

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### Oral Presentations:

- 'Preferential Solvation of Carbohydrates in Water – Trifluoroethanol Mixtures: A Solvent Detected Heteronuclear NMR Approach' at EUROMAR 2020 online meeting during 7<sup>th</sup> – 8<sup>th</sup> December, 2020.
- 'Quantitative Investigation of Interaction Between Aqueous Humic Acid and 2, 6 Difluorobenzoic Acid by <sup>19</sup>F & <sup>1</sup>H NMR Spectroscopy' at Conference on Magnetic Resonance in Medicine & 25<sup>th</sup> National Magnetic Resonance Society Meeting (NMRS) organized by AIIMS and INSA, New Delhi (13<sup>th</sup> February, 2019- 16<sup>th</sup> February, 2019)
- 'Structural transition of aqueous Melittin in presence of Trifluoroethanol: A NMR relaxometry approach' at 3<sup>rd</sup> North-West Meeting on Spectroscopy, Structure and Dynamics organized by IIT Roorkee (5<sup>th</sup> April, 2019- 7<sup>th</sup> April, 2019)

### Poster Presentations:

- 'A Solution NMR Analysis of Photo-degradation of Flupyradifurone: Role of Humic Acid and Its Origin' at ISMAR-APNMR-NMRSJ-SEST 2021 during 22<sup>nd</sup>-27<sup>th</sup> August, 2021 at Osaka, Japan (held online).
- 'Solvation and Structural Transition of Melittin in Trifluoroethanol/Water: A NMR relaxometry and DNP Study' at Small Molecule NMR conference (SMASH 2019) , Porto, Portugal during 21<sup>st</sup> - 25<sup>th</sup> September , 2019.
- 'Structural transition of aqueous Melittin in presence of Trifluoroethanol: A NMR relaxometry and DNP Study' at ISMAR EUROMAR JOINT Conference (EUROISMAR 2019) at Berlin ,Germany during 25<sup>th</sup> – 30<sup>th</sup> August, 2019.

- ‘Hexaflumuron\_β-Cyclodextrin Inclusion Complex as Improved Pesticide Formulation: A NMR Case Study’ at International Conference on Advances in Basic Sciences 2019 (AIP conference proceedings) at Bahal, India during 7<sup>th</sup> - 9<sup>th</sup> February 2019
- ‘Binding interaction of 2,6 Difluorobenzoic acid (DFBA)- Bovine Serum Albumin (BSA): A solution state 19F NMR transverse relaxation and diffusion analysis’ at 7th Asia Pacific NMR Symposium & 23rd Annual Meeting of NMRS-India (APNMR-2017) organized by Department of Chemistry, Indian Institute of Science Bangalore, Feb 16-19, 2017.
- Participated in ‘22nd Conference of National Magnetic Resonance Society of India (NMRS-2016)’ at Department of Chemistry, Indian Institute of Technology Kharagpur, February 18-21, 2016

#### **Workshops:**

- National Workshop on Nuclear Magnetic Resonance (NMR) Spectroscopy organised by Sophisticated Analytical Instrument Facility (SAIF), IIT Madras during 5-7 March, 2018
- National workshop on “Medical Technology Innovation” jointly organized by DRDO Jodhpur, AIIMS Jodhpur and IIT Jodhpur at All India Institute of Medical Sciences Jodhpur, India on 12 February, 2017

#### **AWARDS AND RECOGNITIONS**

- (a) Student Scholarship and (b) Registration fee waiver by SMASH 2019 organizing committee to attend Small Molecule NMR conference (SMASH 2019) held at Porto, Portugal during 21 Sep, 2019- 25 Sep, 2019
- (a) Full Airfare travel grant by CSIR - HRDG (b) Partial Expenses Support by Nuclear Magnetic Resonance Society of India (NMRS) (c) Student Stipend by EUROISMAR 2019 organizing committee to attend ISMAR EUROMAR Joint Conference (EUROISMAR 2019) held at Berlin during 25 Aug,-30 Aug, 2019.
- Best Paper Poster Presentation at International Conference on Advances in Basic Sciences 2019 (AIP conference proceedings) at Bahal, India on Feb 9, 2019.
- JRF fellowship and lecturership eligibility in Chemical Sciences from Council of Scientific & Industrial Research, India, [CSIR JRF-NET], held in December, 2015 (AIR-54)
- JRF fellowship and lecturership eligibility in Chemical Sciences from Council of Scientific & Industrial Research, India, [UGC JRF-NET], held in June, 2015 (AIR-53)
- Graduate Aptitude Test in Engineering by MHRD, India, [GATE], in 2015 and 2016

#### **PROFESSIONAL MEMBERSHIPS**

- Lifetime Member of Nuclear Magnetic Resonance Society (NMRS), India
- Student Member, International Society of Magnetic Resonance (ISMAR)
- Member of Students Counselling Service Team, IIT Jodhpur, 2018 – 2020 and Rotoract Club, Jodhpur, 2018 – 2020

#### **REFERENCES**

Dr. Samanwita Pal  
Associate Professor  
Dept. of Chemistry, IIT Jodhpur  
E-mail: samanwita@iitj.ac.in

Dr. Ritu Gupta  
Associate Professor  
Dept. of Chemistry, IIT Jodhpur  
E-mail: ritu@iitj.ac.in

#### **PERSONAL INFORMATION**

Father’s Name	Arbind Chaubey
Mother’s Name	Kavita Chaubey
Date of Birth	August 10, 1993
Nationality	Indian
Gender	Female
Languages Known	English, Hindi
Interests	Travelling, Dancing, Audiobooks
Marital Status	Unmarried
Corresponding Address	527 NE, 115 <sup>th</sup> St. Seattle, Washington, USA-98125

**(Bhawna Chaubey)**