

## CURRICULUM VITAE

### Umesh Kumar, Ph.D.

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#### Google Scholar:

<https://scholar.google.com/citations?user=19qDI5gAAAAJ&hl=en&authuser=1>

Research Gate: <https://www.researchgate.net/profile/Umesh-Kumar-20>

Orcid ID: <https://orcid.org/my-orcid?orcid=0000-0002-0961-8048>

Web of Science: <https://www.webofscience.com/wos/author/record/2121957>

## EDUCATIONAL QUALIFICATION

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May 2023- Present	<b>Postdoctoral Researcher</b> Institute of Pharmacy/Pharmacognosy University of Innsbruck, Center for Chemistry and Biomedicine Innrain 80 - 82/IV <i>Project Title: "Novel Laboratory techniques in clinical routine" (VASCage),</i>	VASCage
2021-2023	<b>Research Associate – Senior Level</b> <b>Institute:</b> ICAR-National Bureau of Animal Genetic Resources, (NBAGR), Karnal, India-132001 <b>Project Title:</b> <i>Characterizing milk colostrum of Ladakhi cows and Yak for identification of Biomolecules with therapeutic potential.</i> (Mega Project). <b>PI:</b> Dr. Manishi Mukesh, Prinicipal Scientist, Adaptive Physio-Genomic Laboratory, NBAGR, Karnal.	DST- Project
2015-2021	<b>Ph.D. Zoology (NMR based metabolomics)</b> <b>Institute:</b> School of Life Sciences, Department of Zoology, Babasaheb Bhimrao Ambedkar University (Central University), Lucknow, India <i>and</i>	Awarded in 2022

Centre of Biomedical Research, S.G.P.G.I.M.S. campus, Lucknow, India-226014

**Thesis Title:** *Identification of distinctive metabolic signature of autoimmune inflammatory diseases using NMR based metabolomics approach.*

**Ph.D. Supervisor:** Dr. Venkatesh Kumar R., Professor, Babasaheb Bhimrao Ambedkar University, Lucknow, India

**Ph.D. Co-Supervisor:** Dr. Dinesh Kumar, Additional Professor, Centre of Biomedical Research, S.G.P.G.I.M.S. campus, Lucknow, India-226014

**2010-2012 M.Sc. Zoology (Applied Animal Sciences)**

**Institute:** School of Life Sciences, Department of Zoology, Babasaheb Bhimrao Ambedkar University (Central University), Lucknow, India-226025

**2007-2010 B.Sc. (Zoology, Botany and Chemistry)**

**Institute:** M.J.P Rohelkhand University, Bareilly, Uttar Pradesh, 226 007

## **EXPERIMENTAL SKILLS**

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### **Biochemistry/Chemical Biology Lab of CBMR:**

- ❖ Expertise in Sample preparation of Various Biological entities such as Animal/Plant extract, tissue extract, Biological/Clinical bio-fluids (serum, plasma, urine, CSF, SE, saliva, milk etc) for the Solution state NMR spectroscopy.
- ❖ Expertise in sample preparation (Serum, Plasma, urine and milk) for LC-MS and GC-MS.
- ❖ Expertise in 1D and 2D-NMR spectra recording from Solution-state 400 & 800 MHz NMR spectroscopy by using different 1D <sup>1</sup>H-NMR (CPMG, ZGPR,NOESY etc), <sup>1</sup>H-<sup>1</sup>H NMR (JRES, COSY), <sup>1</sup>H-<sup>13</sup>C NMR (HSQC, HMBC and TOCSY) pulse programs.
- ❖ Expertise in data analysis and peak assignment of 1D and 2D NMR spectra by using Bruker Topspin, Amix Aurelia (spectral bucketing), Chenomx (Concentration profiling), Metaboanalyst (Multivariate statistical Analysis), SIMCA, GraphPad prism, Biorender, Pathviews, ChemBiodraw, Adobe Allustrator etc.
- ❖ Well Proficiency in Chenomx software.
- ❖ Hands on experience in HPLC, LC-MS, GC-MS, UV-Vis.

### **Adaptive Physio-Genomic Laboratory:**

- ❖ Experience in RNA isolation from milk somatic cells.
- ❖ Expertise in finding the baseline compositions like Fat, Protein, Lactose, SNF, somatic cell count, water content present in colostrum and milk.

- ❖ Hands on experience in antioxidant assay such as FRAP, DPPH, GSH, and Catalase present in milk samples.
- ❖ Hands-on practice of Cancer Cell line.
- ❖ Hands-on practice of ELISA assay of various Immunoglobulins (IgA, IgG1, IgG2, IgM) and their statistical Analysis.
- ❖ Hands-on practice of Flow cytometry
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## **RESEARCH EXPERIENCE**

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### **Research Associate-III (Dec 2021- 2023) \_ DST Project work in NBAGR**

**Project:** *Characterizing milk colostrum of Ladakhi cows and Yak for identification of Biomolecules with therapeutic potential.*

- ❖ Samples collection from Leh-Ladakh Region area
- ❖ To find Baseline compositions like Fat, Protein, Lactose, SNF of colostrum and milk.
- ❖ Metabolome of Colostrum using NMR and LC-MS based metabolomics.
- ❖ RNA isolation from milk somatic cells and RNA sequencing.
- ❖ Biological samples antioxidants assay such as FRAP, DPPH, GSH and Catalase.
- ❖ Immunoglobulins (IgA, IgG1, IgG2, IgM) ELISA Assay and their analysis.
- ❖ Gene Expression (qPCR).
- ❖ PCR
- ❖ Flow Cytometry
- ❖ Cell culture

### **Ph.D (Sep. 2015 - Oct 2021) Centre of Biomedical Research (CBMR), Lucknow**

**Project:** Identification of distinctive metabolic signature of autoimmune inflammatory diseases using NMR based metabolomics approach.

1. Disease identification and sample collection from clinical wards.
2. Sample preparation and data recording from NMR spectroscopy.
3. Multivariate statistical analysis (PCA, PLS-DA, VIP, ANOVA etc.).
4. **Analytical Skills:** 1H 1D NMR (CPMG, ZGPR, NOESY etc), 1H-1H NMR (JRES, COSY), 1H-13C NMR (HSQC, HMBC and TOCSY), HPLC, LC-MS, GC-MS, UV-Vis.
5. **Computational Skills:** Bruker Topspin, 1D & 2D NMR spectrum Analysis, Amix, Chenomx , SIMCA, MetaboAnalyst, Graphpad Prism, Biorender, Pathviews, ChemBiodraw, Origin, Adobe Illustrator and Microsoft office tools .

**Project Assistant (Apr 2013 - Aug 2015): Nematode Parasitology Lab, Bareilly College Bareilly.**

**Summer Training (June 2011 - Aug 2011): CES, Indian Institute of Sciences, Bangalore.**

**Project:** Molecular Phylogeny of *Hemidactylus brookii* species complex in Himalaya region.  
~DNA isolation

**MSc dissertation (Jan 2012 - June 2012),** Department of Zoology, BBAU Lucknow

## **RESEARCH INTEREST**

***Disease metabotyping:** To identify the disease specific metabolic signatures and to explore their utility in clinical diagnosis and surveillance.*

## **PUBLICATIONS**

	<b>Author (s)</b>	<b>Title</b>	<b>Journal</b>
1	<b>Umesh Kumar</b> , Venkatesh Kumar R., Ramnath Misra* and Dinesh Kumar.	Circulatory Glutamine/Glucose ratio for evaluating disease activity in Takayasu arteritis: A NMR based serum metabolomics study	Journal of Pharmaceutical and Biomedical Analysis.
2	<b>Umesh Kumar</b> , Venkatesh Kumar R., Ramnath Misra* and Dinesh Kumar.	Circulatory Histidine levels as Predictive Indicators of Disease Activity in Takayasu Arteritis	Analytical Science Advances
3	<b>Umesh Kumar</b> , Abhai Kumar*, R.N. Chaurasia, and Dinesh Kumar	An elaborative NMR based plasma metabolomics study revealed metabolic derangements in patients with Mild Cognitive Impairment (MCI): A study on North Indian Population.	Metabolic Brain Disease
4	<b>Umesh Kumar</b> , Supriya Sharma, Venkatesh Kumar R, Gaurav Pande*, and Dinesh Kumar	Serum Metabolic Disturbances Associated with Acute-on-chronic Liver Failure in Patients with Underlying Alcoholic Liver Diseases: An Elaborative NMR-based Metabolomics Study.	Journal of Pharmacy and Bioallied Sciences
5	Gaurav Pande, Manjunath, Dinesh Kumar, <b>Umesh Kumar</b> ... Vikas Agarwal	Response guided slow infusion of albumin, vasoconstrictors and furosemide improves ascites mobilization and survival in acute on chronic liver failure: a proof-of-concept study.	Journal of Inflammation Research.
6	Payal Arya, <b>Umesh Kumar</b> , Gaurav Pande* and Dinesh Kumar	Targeted NMR based serum metabolic profiling of serine, glycine and methionine in Acute-on- Chronic liver failure patients: Possible insights into mitochondrial dysfunction	Analytical Science Advances.
7	Anupam Guleria, <b>Umesh Kumar</b> , Dinesh Kumar... Vikas Agarwal, Ramnath Misra and Latika Gupta	NMR based Serum and Muscle Metabolomics for Diagnosis and Activity Assessment in Idiopathic Inflammatory Myopathies.	Analytical Science Advances

8	Sujata ganguly, <b>Umesh Kumar</b> ... Amita Aggarwal, Dinesh Kumar, Ramnath Misra	NMR based Targeted profiling of urinary acetate and citrate following Cyclophosphamide therapy in patients with Lupus nephritis.	Lupus
9	Avinash Jain, Dinesh Kumar*, <b>Umesh Kumar</b> , Debashish Danda, Ramnath Misra	NMR-based Serum Metabolomics of patients with Takayasu arteritis (TA) – Relationship with disease activity	Journal of Proteome Research
10	Anupam Guleria, Amit Kumar, <b>Umesh Kumar</b> , Ritu Raj, and Dinesh Kumar	NMR based metabolomics: An exquisite and facile method for evaluating therapeutic efficacy and screening drug toxicity.	Current Topics in Medicinal Chemistry.
11	Anupam Guleria*, Sanat Phatak, <b>Umesh Kumar</b> , Amita Aggarwal, Dinesh Kumar*, and Ramnath Misra	NMR based serum metabolomics reveals reprogramming of lipid dysregulation following Cyclophosphamide based induction therapy in lupus nephritis.	Proteome Research.
12	Dinesh Kumar*, Gaurav Pandey*, Atul Rawat, <b>Umesh Kumar</b> , and Vivek Anand Saraswat	NMR based urinary profiling of Lactulose/Mannitol ratio used to assess the altered intestinal permeability in acute on chronic liver failure (ACLF) patients.	Magnetic Resonance in Chemistry.
13	Anupam Guleria*, <b>Umesh Kumar</b> , Paul Bacon, Ramnath Misra and Dinesh Kumar*.	NMR based serum metabolomics reveals a distinctive signature in patients with Lupus Nephritis	Scientific Reports
14	Atul R., Durgesh, Anupam, <b>Umesh Kumar</b> , Anand Prakash, Sudipta Saha, and Dinesh Kumar	*. 1H NMR based Serum Metabolomics reveals Erythromycin induced Liver Toxicity in Albino Wistar Rats	Journal of Pharmacy and Bioallied Sciences.

### Articles on Pharmaceutical based metabolomics

1	Nisha Raquibun, Pranesh Kumar, <b>Umesh Kumar</b> , Anupam Guleria, and Shubhini A. Saraf	Assessment of hyaluronic acid-modified imatinib mesylate cubosomes through CD44 targeted drug delivery in NDEA-induced hepatic carcinoma.	International Journal of Pharmaceutics
2	Nisha, Raquibun, Pranesh Kumar, <b>Umesh Kumar</b> ,.....and Shubhini A. Saraf	Fabrication of imatinib mesylate-loaded lactoferrin-modified PEGylated liquid crystalline nanoparticles for mitochondrial-dependent apoptosis in hepatocellular carcinoma	Molecular pharmaceutics.
3	Pranesh Kumar, A.K., Gautam, <b>Umesh Kumar</b> , Dinesh Kumar, and Sudipta Saha	Mechanistic Exploration of the activities of PLGA-loaded betulinic acid nanoparticles against hepatocellular carcinoma at cellular and molecular levels.	Archieves of Physiology and Biochemistry.
4	Sandeep Kumar Singh*, <b>Umesh Kumar</b> , Anupam Guleria and Dinesh Kumar.	A brief overview about the use of different bioactive liposome-based drug delivery systems in Peritoneal Dialysis and some other diseases.	Nano Express

5	Pranesh Kumar, Aakriti, Ashok, <b>Umesh Kumar</b> , Dinesh Kumar, Sudipta Saha	Antineoplastic properties of zafirlukast against hepatocellular carcinoma via activation of mitochondrial mediated apoptosis.	Regulatory Toxicology and Pharmacology
6	Vinit Raj, Archana S. Bhadauria, Ashok Singh, <b>Umesh Kumar</b> ....Dinesh Kumar and Sudipta Saha*.	Novel 1, 3, 4-thiadiazoles inhibit colorectal cancer via blockade of IL-6/COX-2 mediated JAK2/STAT3 signals as evidenced through data-based mathematical modeling.	Cytokine
7	Vimal Maurya, Pranesh Kumar... <b>Umesh Kumar</b> , Dinesh Kumar, Sudipta Saha	Zolmitriptan attenuates hepatocellular carcinoma via activation of caspase mediated apoptosis.	Chemico-Biological Interactions.
8	Amit Rai, <b>Umesh Kumar</b> , Vinit Raj, Ashok K Singh, Dinesh Kumar, and Sudipta Saha	Novel 1,4 benzothazines obliterate COX-2 mediated JAK-2/STAT-3 signals with potential regulation of oxidative and metabolic stress during colorectal cancer.	Pharmacological Research.
9	Ashok K Singh, <b>Umesh Kumar</b> , Vinit Raj, Dinesh Kumar, and Sudipta Saha*.	Novel fused oxazepino-indoles (FOIs) attenuate liver carcinogenesis through IL 6/JAK2/STAT3 signaling blockade with strong metabolic regulations.	Life Sciences.
10.	Ashok Singh, Archana, <b>Umesh Kumar</b> ,...Dinesh Kumar, Anand Prakash, and Sudipta Saha	Novel Indole-fused benzo-oxazepines (IFBOs) inhibit invasion of hepatocellular carcinoma by targeting IL-6 mediated JAK2/STAT3 oncogenic signals.	Scientific Reports
11	Priyanka Mishra, Vinit Raj, Archana, <b>Umesh Kumar</b> , Dinesh Kumar, Sudipta Saha*.	6,7- dimethoxy-1,2,3,4 tetrahydroisoquinoline-3-carboxylic acid attenuates colon carcinogenesis via blockade of IL-6 mediated signals.	Biomedicine & Pharmacotherapy.
12	Atul Rawat, Anupam Guleria, Durgesh, <b>Umesh Kumar</b> , Dinesh Kumar*, Sudipta Saha	Metabolomics approach discriminates toxicity index of Pyrazinamide and its metabolic products; Pyrazinoic acid and 5-Hydroxy Pyrazinoic acid.	Human and Experimental Toxicology.
13	Vinit Raj, Amit Rai, Ashok K Singh, <b>Umesh Kumar</b> , Dinesh Kumar, and Sudipta Saha*	Discovery of Novel 2- Amino-5- (Substituted)-1,3,4-Thiadiazole Derivatives: New Utilities for Colon Cancer Treatment.	Anti-Cancer Agents in Medicinal Chemistry.
14	Pranesh, Ashok, Amit, <b>Umesh Kumar</b> , Dinesh Kumar, Anand Prakash, Anupam, Sudipta Saha*.	6,7-dimethoxy-1,2,3,4-tetrahydro-isoquinoline-3-carboxylic acid attenuates hepatocellular carcinoma in rats with NMR based metabolic perturbations.	Future Science.
15	Anil Sahadev, Vinit Raj, Ashok, <b>Umesh Kumar</b> , Atul, Dinesh Kumar, Anand Prakash, and Sudipta saha*.	Ameliorative effects of Pyrazinoic acid against oxidative and metabolic stress manifested in rats with dimethylhydrazine induced colonic carcinoma.	Cancer Biology and Therapy.

16	Amit Kesari, Ashok <b>Umesh Kumar</b> ,....Dinesh Kumar, and Sudipta Saha*.	5H-benzo[h]thiazolo[2,3b] quinazolines ameliorate NDEA induced hepatocellular carcinogenesis in rats through IL-6 down-regulation along with oxidative and metabolic stress reduction.	Drug Design, Development and Therapy.
17	Amit K Keshari, Singh AK, Vinit Raj..... <b>Umesh Kumar</b> , Atul Rawat, Dinesh Kumar, and Sudipta Saha*.	p-TSA- promoted syntheses of 5H-benzo[h]thiazolo[2,3-b]quinazoline and indeno[1,2-d]thiazolo[3,2-a]pyrimidine analogs: molecular modeling and in vitro antitumor activity against hepatocellular carcinoma.	Drug Design, Development and Therapy.
18	Amit Rai, <b>Umesh Kumar</b> , Dinesh kumar and Sudipta Saha.	Design and synthesis of 1, 4-benzothiazine derivatives with promising effects against colorectal cancer cells.	Cogent Chemistry
19	Venkatesh K.R., Devika, Vandana, <b>Umesh Kumar</b> , Dinesh Kumar	Characterization, biological evaluation and molecular docking of mulberry fruit pectin.	Scientific Reports
<b>Book chapters/ conference papers</b>			
1.	Ramnath Misra, Avinash Jain, Dinesh Kumar, <b>Umesh Kumar</b> and Paul Bacon.	NMR-Based serum metabolomics of patients with Takayasu Arteritis (TA) and Relationship with Disease Activity. (Conference paper, 2017ACR/ARHP, Abstract Number: 1848).	Arthritis and Rheumatology.
2	Avinash Jain*, Dinesh Kumar, <b>Umesh Kumar</b> , Bacon PA, and Ramnath Misra. DOI: 10.1136/annrheumdis-2017-eular.6057	NMR-Based serum metabolomics of patients with Takayasu Arteritis (TA): Relationship with Disease Activity. (Conference paper, EULAR-2017, Identifier: THU0307).	Annals of Rheumatic disease.
3	Gaurav Pandey, Krishna V P, <b>Umesh Kumar</b> , Prabhat Sharma, Dinesh Kumar, Samir Mohindra, Deepak Bansal, and Vivek A. Saraswat.	NMR based urinary profiling of Lactulose/Mannitol ratio to compare the intestinal permeability in cirrhosis, acute on chronic liver failure (ACLF) patients and normal controls. (Conference paper, The Liver Meeting AASLD 2016, Label: Infections and Acute on Chronic Liver Failure).	Hepatology
4	Dinesh Kumar#, Atul, Durgesh, <b>Umesh Kumar</b> , Amit, Sudipta and Anupam Guleria	NMR based Metabolomics: An emerging tool for therapeutic evaluation of Traditional Herbal Medicines.	SMe Books: Nuclear Magnetic Resonance Spectroscopy.
5	Latika Gupta, Dinesh Kumar, <b>Umesh Kumar</b> , Able Lawrence, and Ramnath Misra.	NMR-based serum metabolomics as surrogate for disease activity in inflammatory myositis. Conference paper accepted for Oral Presentation during 20th Asia Pacific League of Associations for	International Journal of Rheumatic Diseases.

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		Rheumatology Congress (APLAR), 6–9 September 2018, Kaohsiung, Taiwan.	
6	V.P. Krishna, Gaurav Pandey, Dinesh Kumar, <b>Umesh Kumar</b> , Samir Mohindra, Manjunath Hatti and Vivek Saraswat	Significant Increase in Intestinal Permeability in Acute-On-Chronic Liver Failure (ACLF) is Reversed After Slow Albumin Furosemide Infusion With or Without Terlipressin.	Journal of Clinical and Experimental Hepatology.
7	Vivek Saraswat, Gaurav Pandey*, Dinesh Kumar, <b>Umesh Kumar</b> , Krishna Vp, Anupam Guleria.	Significant Increase in Intestinal Permeability in Acute-On-Chronic Liver Failure (ACLF) is Reversed after Slow Albumin furosemide Infusion with or without Terlipressin.	Journal of Clinical and Experimental Hepatology.
8	<b>Umesh Kumar</b>	Circulatory Histidine levels for the assessment of disease activity in Takayasu arteritis: A targeted NMR based serum metabolomics study	Metabolomics

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## **NATIONAL/INTERNATIONAL CONFERENCES AND WORKSHOPS**

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- ❖ **Presented** an oral presentation paper titled "Unraveling milk and colostrum characteristics of Ladakhi cows adapted to high altitude hypoxia environment: A metabolomic approach" in SOCDAB-2022, XIX Annual convention & National symposium on Contemporary technology for Animal Genetic Resource (AnGR) Management, at ICAR-NBAGR, Karnal, India, 21-22 September, 2022.
- ❖ **Presented** a poster presentation titled in ISAGB-2021 National Conference on Animal Breeding Strategies in the Era of Genomics and Phenomics, 17-18 December 2021.
- ❖ **Attended** "8th International Translational Cancer Research Conference: Role of Inflammation and Immune System for Cancer Prevention and Treatment" held during February 13 – 16, 2020. Organized by: Department of Biochemistry, Institute of Science, Banaras Hindu University, Varanasi-221005, INDIA & Society for Translational Cancer Research (STCR).
- ❖ **Attended** National Symposium on "Integration of Natural Healthcare Systems and Modern Science: Potential Merits and Future Roadmap" (TBRS-2019) held at Babasaheb Bhimrao Ambedkar University (BBAU), Lucknow-226025, UP (A Central University) during November 2nd to 3rd, 2019 in association with Translational Biomedical Research Society (TBRS)| India.
- ❖ **Presented Poster** in The Conference on Magnetic Resonance in Medicine & 25th National Magnetic Resonance Society Meeting held at AIIMS, Delhi during 13th-16th Feb, 2019.
- ❖ The International symposium on Molecular Medicine (ISMM-2018) held at SGPGIMS, Lucknow during 14th-16th Dec, 2018 (Organized by: Department of Molecular Medicine & Biotechnology) (**Poster Presentation** on "Depleted Serum Phenylalanine, Tyrosine and their Ratio during initial hours of Acute Myocardial Infarction revealed by Targeted 1H NMR based metabolomics").



- ❖ **Presented** a poster presentation titled “Increased Intestinal Permeability in Patients with Acute-on Liver Failure (ACLF) and Its Reversal by Gut Decongestion, Fluid Mobilization is Revealed by Based Urinary Profiling of Lactulose/Mannitol Ratio (LMR)”, in 24th meeting of the “National Magnetic Resonance Society” of India (NMRS 2018) held at the Indian Institute of Science Education and Research (IISER), Mohali, during February 16-19.
- ❖ **Abstract entitled** “Serum Metabolomics Analysis Reveals a Distinct Metabolic Profiles of Myositis Patients Compared to Lupus patients.” by Latika Gupta, Anupam Guleria, Dinesh Kumar, Umesh Kumar, and Ramnath Misra was selected for Oral Presentation selected for 58th Annual Scientific Meeting of Australian Rheumatology Association held at Melbourne during May 5-8, 2018 (Under APLAR Scholarship).
- ❖ **Presented a poster presentation titled** “NMR based serum metabolomics reveals a distinctive signature in patients with Lupus Nephritis” in 33rd annual conference of the Indian Rheumatology Association (IRACON 2017) , held during 30th November to 3rd December, 2017 at SGPGIMS, Lucknow.
- ❖ **Attended** National Workshop on “Discovering Biomarkers of Diseases: A Bioinformatics Approach”, held at Biotech Park, Lucknow, during March 1 to 4, 2017.
- ❖ **Attended** International Conference on Updates in Cancer Prevention and Research 2017 (ICUCPR 2017) held at Department of Biotechnology, BBAU, Lucknow. (Talk on “NMR Based Metabolomics for Biomarker Discovery and its use in Cancer Diagnosis, Prognosis, and Therapeutic evaluation”)
- ❖ **Attended** National “Workshop on NMR/MRI: From Molecules to Human Behaviour”, held at University of Mysore, Mysore, Karnataka, during Nov 15 to 20, 2015. (Organized and attended).

## AWARDS AND ACHIEVEMENTS

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- ❖ **2022:** Qualified Assistant Professor Exam of Uttar Pradesh Higher Education Service Commission (UPHESC) in Zoology at national level.
- ❖ **2020:** Life Member of Indian Scientific Education and Technology Foundation (ISETF).
- ❖ **2019:** Life Member of Translational Biomedical Research Society, India (TBRSI)
- ❖ **2016:** Life Member of National Magnetic Resonance Society (NMRS), India
- ❖ **2015:** Qualified National Eligibility Test (NET) in Life Science UGC-CSIR Exam, Council of Scientific and Industrial Research, New Delhi, India. **(All India Rank 77).**
- ❖ **2014:** Qualified ICMR-JRF, Indian Medical Council of Medical Research, New Delhi, India, **(All India Rank 34).**
- ❖ **2014:** Qualified GATE, Graduate aptitude test in engineering, IIT-Kharagpur, India

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**Number of publications = 43(02 Chapters)**

**Citation: 503 (Google Scholar)**

**H-index: 13, i10- index: 21**