Curriculum Vitae

Santosh Kumar, PhD, Assistant Professor, Grade II, (Feb. 2018 – Continuing)
Life Science, National Institute of Technology, Rourkela, Odisha-769008, India

RESEARCH EXPERIENCE

1. **SERB N-PDF fellow** (File no.: PDF/2016/000004), IISER Pune, on the project entitled "Structural and Biophysical Characterization of miRNA-7/HuR/MSI2 ternary complex" (July 2016-Feb 2018).
2. **Post-doctoral researcher**, on a project entitled "Small molecule mediated regulation of miRNA biogenesis and its therapeutic implications in glioblastoma" at WTCCB, University of Edinburgh, UK (Dec. 2014-Dec. 2015).
3. **PhD awarded** (Degree awarded from Savitribai Phule Pune University), Thesis title "Biophysical characterization of RNA–Protein interactions", under the guidance of Dr. Souvik Maiti from CSIR-IGIB, New Delhi, India. (2009- 2014)
4. **M.Sc. Dissertation** entitled "Co-solvent (Polyamines) assisted protein refolding using Lysozyme as a model protein" at School of Biotechnology, Jawaharlal Nehru University, New Delhi (2008-2009), Supervisor Prof. Rajiv Bhat.

Education Qualification

2016-2018	**SERB N-PDF** at Chemistry department, IISER Pune, Pune, India
2014-2015	**Post-doctoral researcher at** The Wellcome Trust Centre for Cell Biology, University of Edinburgh, UK.
2009-2013	**PhD (Biotechnology), CSIR-**IGIB, Delhi, Degree awarded by Savitribai Phule Pune University, Pune.
2007-2009	**M.Sc (Biotechnology),** School of Biotechnology, Jawaharlal Nehru University, New Delhi, CGPA 6.57, max. CGPA is 9.0, Lower First Class.
2004-2007	**B.Sc (Hons.),** Department of Chemistry, Banaras Hindu University, Varanasi, India. Score: 1278/1800, 71%, First class
2003-2004	**Intermediate (10+2),** Tilakdhari Singh Inter College Jaunpur, UP Board, Score 323/500, 64.6%, First Division
2001-2002	**High School (10th)** Tilakdhari Singh Inter College Jaunpur, UP Board, Score 370/600, 61.6%, First Division

Externally Sponsored R & D Projects

1. ICMR Extra mural research grant, India, research proposal entitled “SNP mediated changes in the structure of VPS26A mRNA and its implication in the etiology of Diabetes” awarded (Total Budget: Rs. 4062398/-), Jan 2022 to Dec. 2024.
2. SERB, DST, research proposal entitled “Genome-wide identification of lncRNA Ribosnitches and their Biophysical characterization”. (Total budget: Rs. 3763000/-), Feb. 2019 to Aug 2022.
3. SERB DST research proposal for SERB National Post-Doctoral fellowship, file number : PDF/2016/000004 titled **Structural and Biophysical Characterization of miRNA-7/HuR/MSI2 ternary complex.**(Total allocated money Rs. 19,20,000/) 26/07/2016 – 12/02/2018.

Publications

Research Articles and Reviews

1 Dwibedy SSL, Singh M, Biswal SR, Muthuswamy S, Kumar A, **Kumar S**, Circular RNA and RNA binding proteins act together and regulate glioma. **Human Gene**, Volume 35, 2023, 201156, ISSN 2773-0441, https://doi.org/10.1016/j.humgen.2023.201156.

2 Tiwari RK, Rawat SG, Gupta VK, Jaiswara PK, Sonker P, **Kumar S**, Gautam V, Mishra MK, Kumar A. Epinephrine facilitates the growth of T cell lymphoma by altering cell proliferation, apoptosis, and glucose metabolism. Chem Biol Interact. 2022 Nov 22;369:110278. doi: 10.1016/j.cbi.2022.110278. Epub ahead of print. PMID: 36423730.

3 Singh M, **Kumar S**, Effect of Single Nucleotide Polymorphisms on the structure of long noncoding RNAs and their interaction with RNA Binding Proteins. **bioRxiv** 2022.07.26.501647; doi: https://doi.org/10.1101/2022.07.26.501647

4 Kumari, S., **Kumar, S.**, Muthuswamy, S. RNA N6-methyladenosine modification in regulating cancer stem cells and tumor immune microenvironment and its implication for cancer therapy. J Cancer Res Clin Oncol (2022). https://doi.org/10.1007/s00432-022-04158-z

5 Rawat SG, Tiwari RK, Jaiswara PK, Gupta VK, Sonker P, Vishvakarma NK, **Kumar S**, Pathak C, Gautam V & Kumar A, Phosphodiesterase 5 inhibitor sildenafil potentiates the

antitumor activity of cisplatin by ROS-mediated apoptosis: a role of deregulated glucose metabolism. Apoptosis, 2022, 27(7-8), pp. 606–618.

6 Kanoria S., Kumar S.*, Editorial: Non-coding RNA Mediated Post-Transcriptional Regulation in Human Diseases, Frontiers in Genetics RNA, 2022, 13, 901664.

7 Singh M, Dwibedy SLL, Biswal SR, Muthuswamy S, Kumar A, **Kumar S***. Circular RNA: A novel and potential regulator in pathophysiology of schizophrenia. Metab Brain Dis. 2022, 37(5), pp. 1309–1316.

8 Mishra P, **Kumar S*,** Association of lncRNA with regulatory molecular factors in brain and their role in the pathophysiology of Schizophrenia. **Metab Brain Dis**. 36, 849–858 (2021). https://doi.org/10.1007/s11011-021-00692-w.

9 **Kumar S**, Velasco ADR, Michlewski G. Oleic Acid induces miR-7 processing through remodelling of pri-miR-7/protein complex. **J Mol Biol.** 2017 Jun 2; 429(11): 1638–1649. (IF: 5.067)

10 **Kumar S,** Mapa K, Maiti S. Understanding the effect of LNA and 2-O methyl modification on the hybridization thermodynamics of miRNA-mRNA pair in the presence and absence of AfPiwi protein. **Biochemistry**. 2014 Mar 18;53(10):1607-15. (IF: 3.194)

11 **Kumar S**, Maiti S. The effect of N-acetylation and N-methylation of Lysine residue of Tat peptide on its interaction with HIV-1 TAR RNA. **PLoS ONE**, 2013 Oct 17;8(10):e77595. (IF: 3.534)

12 **Kumar S**, Maiti S. Effect of different arginine methylations on the thermodynamics of Tat peptide binding to HIV-1 TAR RNA. **Biochimie**. 2013 Jul;95(7):1422-31. (IF: 3.123)

13 **Kumar S**, Bose D, Suryawanshi H, Sabharwal H, Mapa K, Maiti S. Specificity of RSG-1.2 peptide binding to RRE-IIB RNA element of HIV-1 over Rev peptide is mainly enthalpic in origin. **PLoS One**. 2011;6(8):e23300. (IF: 4.092)

14 Jaiswara P K, Gupta V K, Sonker P, Rawat S G, Tiwari R K, Pathak C, **Kumar S**, Ajay Kumar. Nimbolide induces cell death in T lymphoma cells: Implication of altered apoptosis and glucose metabolism Environ Toxicol. 2021 Apr;36(4):628-641. doi: 10.1002/tox.23067. Epub 2020 Dec 4

15 Bhosle GS, Kharche S, **Kumar S**, Sengupta D, Maiti S, Fernandes M. Superior HIV-1 TAR-Binders with Conformationally Constrained R52 Arginine Mimics in Tat (48-57) Peptide. **ChemMedChem**. 2018 Feb 6;13(3):220-226 (IF: 3.016)

16 Soni V, Suryadevara P, Sriram D; OSDD Consortium, **Kumar S**, Nandicoori VK, Yogeeswari P. Structure-based design of diverse inhibitors of Mycobacterium tuberculosis N-acetylglucosamine-1-phosphate uridyltransferase: combined molecular

docking, dynamic simulation, and biological activity. **J Mol Model**. 2015 Jul;21(7):2704. (IF: 1.736)

17 Agarwala P, **Kumar S**, Pandey S, Maiti S. Human Telomeric RNA G-Quadruplex Response to Point Mutation in the G-Quartets. **J Phys Chem B.** 2015 Apr 2;119(13):4617. (IF: 3.377)

18 Dey D, **Kumar S**, Banerjee R, Maiti S, Dhara D. Polyplex Formation Between PEGylated Linear Cationic Block Copolymers and DNA: Equilibrium and Kinetic Studies. **J Phys Chem B.** 2014 Jun 26;118(25):7012. (IF: 3.377)

19 Agarwal T, Roy S, **Kumar S**, Chakraborty TK, Maiti S. In the Sense of Transcription regulation by G-quadruplexes: Asymmetric effects in sense and anti-sense strand. **Biochemistry**. 2014 Jun 17;53(23):3711. (IF: 3.194)

20 Agarwal T, Lalwani M K, **Kumar S**, Roy S, Chakraborty T K, Sivasubbu S, Maiti S. Morphological effects of G-quadruplex stabilization using small molecule in Zebrafish. **Biochemistry**, 2014, 53 (7), pp 1117. (IF: 3.194)

21 Kumar A, **Kumar S,** Taneja B. Crystal structure of Rv2372c identifies a RsmE-like methyltransferase from M. tuberculosis. **Acta Crystallogr D Biol Crystallogr**. 2014 Mar;70(Pt 3):821. (IF: 7.2)

22 Dey D, **Kumar S**, Maiti S, Dhara D. Stopped-Flow Kinetic Studies of Poly(amidoamine) Dendrimers-Calf Thymus DNA to Form Dendriplexes. **J Phys Chem B**. 2013 Nov 7;117(44):13767. (IF: 3.377)

23 Arora G, Sajid A, Arulanandh MD, Misra R, Singhal A, **Kumar S**, Singh LK, Mattoo AR, Raj R, Maiti S, Basu-Modak S, Singh Y. Zinc regulates the activity of kinase-phosphatase pair (BasPrkC/BasPrpC) in Bacillus anthracis. **Biometals**. 2013 Oct;26(5):715. (IF: 1.689)

24 Bose D, Jayaraj GG, **Kumar S**, Maiti S. A molecular-beacon-based screen for small molecule inhibitors of miRNA maturation. **ACS Chem Biol**. 2013 May 17;8(5):930. (IF: 5.356)

25 Goel T, **Kumar S**, Maiti S. Thermodynamics and solvation dynamics of BIV TAR RNA-Tat peptide interaction. **Mol Biosyst**. 2013 Jan 27;9(1):88. (IF: 3.183)

26 Agarwal T, **Kumar S**, Maiti S. Unlocking G-quadruplex: Effect of unlocked nucleic acid on G-quadruplex stability. **Biochimie**. 2011 Oct;93(10):1694. (IF: 3.022)

Book and Book Chapters

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1. **Kumar S**, Regulation of posttranscriptional events by RNA-binding proteins, Editor(s): Manoj Garg, Gautam Sethi, Amit Kumar Pandey, Transcription and Translation in Health

and Disease, **Academic Press**, 2023, Pages 93-108, ISBN 9780323995214, https://doi.org/10.1016/B978-0-323-99521-4.00017-9.

2. S Kanoria, **S Kumar**, F Hubé, Non-coding RNA Mediated Post-Transcriptional Regulation in Human Diseases. Frontiers in Genetics RNA – 2022 (eBook)
3. **Kumar S, Srinivansan M**. Biology for Engineers. 2021 Book, Khanna Publishers, Delhi, ISBN: 978-93-92549-01-4, 1st Edition.
4. **Kumar S.**, Vishwakarma N K, Kumar A. Clinical Applications of Non-Coding RNAs in Lung Cancer Patients. (Book Chapter 5 "***Clinical Applications of Non-Coding RNAs in Cancer"***, Elsevier), 2022, Pages 141-175, ISBN: 978-0-12-824550-7.
5. **Kumar S.*** Role of RNA binding proteins in post-transcriptional regulation of cancer. (Book Chapter, **Transcription and Translation in Health and Disease**., Elsevier, in press)
6. **Kumar S*,** Suryawanshi H. Role of miRNAs in cardiovascular diseases and their therapeutic implications. *Mallick/AGO-driven Non-Coding RNAs: Codes to Decode the Therapeutics of Diseases,* **Elsevier., 2019,** 233-259, ISBN: 978-0-12-815669-8.
7. **Kumar S***. Second Messengers. Book chapter in Concepts in Cell Signaling. Agri-Biovet Press, New Delhi, India, (2017) 72-83, ISBN: 978-93-84502-47-8.
8. Pratishtha S, **Santosh K*** Ajay K*. The PI3K/Akt Signaling Pathway. Book chapter in Concepts in Cell Signaling. Agri-Biovet Press, New Delhi, India, (2017) 196-207, ISBN: 978-93-84502-47-8.

Guest Associate Editor in

1. **Frontiers in Genetics** RNA section, Non-coding RNA Mediated Post-Transcriptional Regulation in Human Diseases
2. **Frontiers In Oncology** Cancer Metabolism, Regulation of Metabolic Rewiring in T-Cell Malignancies

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Academic Responsibilities

PhD Student: 03 continuing

MSc dissertation thesis: 08 completed.

Teaching Experience: more than 04 years, (Subjects taught: Bioanalytical techniques (MSc students), Enzymology and metabolism (MSc students), Biology for B. Tech students, Molecular Evolution (MSc level), Evolutionary Biology (BSc level).

Adhoc Reviewer for Journals: Nature scientific reports, International Physiology Journal,

JBSD, PloS One, Chronobiology International, Metabolic Brain diseases, Frontiers in Genetics, Frontiers in Immunology, Frontiers in Neuroscience.

Reviewer for Book chapters: Book chapter (Elsevier Publication), Book Chapter (Springer publication).

Reviewer for Research Project Proposals: SERB-CRG/EMR project, SERB COVID-19 special call.

Administrative Responsibilities:

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1. PIC NSS, NIT Rourkela, 20/09/2022 to 30/06/2024)
2. Assistant Warden in MSS hall of residence, NIT Rourkela (July 2020–June 2022.
3. Member of Library Advisory Committee of BPCL, NIT Rourkela 2020-2023.
4. Member in department task force committee for COVID-19 since 2020-2022
5. Faculty Advisor for MSc Life Science 2022-2024 Batch NIT Rourkela.
6. Faculty Advisor for MSc Life Science 2018-2020 Batch NIT Rourkela
7. PIC Seminar, LS department from 01/07/2020- 2023
8. Member of disciplinary committee of Hall Management Committee 2020-2022.
9. Member of COVID-19 contact tracing committee of HMC 2021-2022

Conferences and workshop

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1. Invited as a speaker "Identification of lncRNA ribosnitches and their binding proteins involved in cancer" for ***8th International Translational Cancer Research Conference*** organized at the Banaras Hindu University, Varanasi, India from ***February 13-16, 2020***. The theme of the conference was ***"Inflammation and Immune System for Cancer Prevention and Treatment"***.
2. Presented poster "Santosh Kumar, Debojit Bose, Hemant Suryawanshi, Harshana Sabharwal, Koyeli Mappa, Souvik Maiti∗ Specificity of RSG-1.2 Peptide Binding to RRE-IIB RNA Element of HIV-1 Over Rev Peptide is Enthalpic in Origin" national workshop on **"Fluorescence Correlation Spectroscopy and Biophotonics (FCS 2010)"** held at NEHU, Shillong, INDIA 8-13th Nov. 2010.
3. Presented poster "Santosh Kumar#1, Teena Goel#1 and Souvik Maiti1Understanding the Thermodynamics and Solvation dynamics of BIV TAR RNA-Tat Peptide complex formation" at **"National Fluorescence Workshop: Spectroscopy and Microscopy in Biology and Chemistry"** held at ICGEB, New Delhi, November 14-18, 2011.
4. Presented poster "Santosh Kumar, Debojit Bose, Hemant Suryawanshi, Harshana

Sabharwal, Koyeli Mapa, Souvik Maiti∗Enthalpic RSG-1.2 binding vs. Entropic Rev binding: A comparative Thermodynamic study of the two peptides binding to RRE-IIB RNA" at the Keystone symposium **"Protein-RNA Interactions in Biology and Disease"** held at Santa Fe, New Mexico USA during March 4 - March 9, 2012.

5. Presented poster "Post-translation modification of RNA binding proteins and their effect on thermodynamics of their RNA binding (using HIV-1 TAR RNA and Tat peptide as model) Santosh Kumar, Souvik Maiti" at the "International Conference on Chemical Biology: Disease Mechanisms and Therapeutics (ICCB-2014), held at CSIR-IICT, Hyderabad Feb. 6-8, 2014.
6. Attended the conference of **"Asia-Pacific National Magnetic Resonance 2011 (APNMR-2017)"** held at, IISc, Bangalore, 16-19th Feb. 2017.

Awards and achievements

1. RNA society USA, Full member, 19/01/2021-18/01/2024 (membership number: **4883)**
2. Awarded SERB N-PDF fellowship from DST India 2016.
3. Awarded three-year membership of American Chemical Society 2015-2018
4. Granted International travel support from DST, India, to attend Keystone conference held at Santa Fe, New Mexico USA during March 4 - March 9, 2012.
5. Qualified for CSIR-JRF, India (December 2008)
6. Qualified for all India Junior Research Fellowship, DBT, India, (2009)
7. Fellowship from all India DBT, Govt. India for master's degree course 2007.

Contact Address:

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Scopus ID: 57213855920