

Curriculum Vitae



1. Name of the Applicant: Dr. Sarika Saxena. Associate Prof.

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3. Date of Birth & Gender: 18.01.1974, Female.

4. Educational Qualifications (Starting from Graduation onwards):

- B.Sc. General ‘Gr. B’: Delhi University (June 1992- July 1995).
- M.Sc. Biochemistry: Jamia-Hamdard (June, 1996 - July, 1998).
- Ph.D. Biophysical Chemistry: Delhi University (1998-Feb. 2002).
- Post-doctorate: FIBER (Frontier Institute of Biomolecular Engineering and Research), Konan University, Japan (July 2008-Aug. 2010).

5. Professional recognition, awards, fellowships received:

1. CSIR-UGC (NET) Qualified.
2. NET (For Lecturership/Assistant Professor ship) in Plant Biochemistry conducted by Agricultural Scientists Recruitment Board (ICAR).
3. SRF from ‘Lady Tata Memorial Trust’, Mumbai’ (Aug 2000-Aug. 2002).
4. Winner of Gilbert Ling Poster Award (Only Indian selected from Asia and also received travel grant of 500 dollars from the organizer Gerald Pollack), Bulgaria, Sofia.
5. Received Travel Grant from Steven Sedmeyer, USA, Bulgaria, Sofia.

Total Citations: 500

h-index: 9

i-10 index: 9

Details of completed research projects, duration, total budget, sponsoring agency:

1. To study the effect of natural biomolecules as molecular crowding agents on the structure and stability of nucleic acid structures. **Approved from Department of Science and Technology (DST) as Principal Investigator. Total Budget: Rs. 22,75,000/-.**

2. Identification of specific small peptide inhibitors that bind to G-quadruplex motifs of cellular and viral proto-oncogenes and telomeric sequences in cancer and cancer stem cells for therapeutic intervention. **Approved from Department of Biotechnology (DBT) as Principal Investigator. Total Budget: Rs. 54 Lakhs.**

Full Patent: 'A PEPTIDE LIBRARY FOR SCREENING THE TELOMERIC AND CANCER PROTO[1]ONCOGENE G-QUADRUPLEX AND METHOD THEREOF' Submitted on Feb, 18, 2022. **Application Number 202211008538**

Papers published

1. **Sarika Saxena***, Sarvpreet Kaur, Nikita Kundu, Taniya Sharma, Jadala Shankaraswamy, Structural studies of peptide identified from the 2KRR domain of nucleolin protein with c-Myc G4 structure. 2024 (*RSC Advances* under peer review)
2. Sarvpreet Kaur, Nikita Kundu, Taniya Sharma, Jadala Shankaraswamy, **Sarika Saxena** Targeting G4 motifs of various stem cell makers with designed peptide for therapeutic applications. *Discov Appl Sci* **6**, 236 (2024).
3. Sarvpreet Kaur, Nikita Kundu, Taniya Sharma, Jadala Shankaraswamy, **Sarika Saxena**. Identification of G4 motifs of various stem cell markers and their biophysical and biochemical characterization. *J Biomol Struct Dyn*. Published online October 14, 2023.

4. Taniya Sharma Nikita Kundu, Sarvpreet Kaur, Jadala Shankaraswamy and **Sarika Saxena**. Why to target G-quadruplexes using peptides: Next-generation G4-interacting ligands. *Journal of Peptide Science*, 2023 Apr 3: e3491.
5. Nikita Kundu, Taniya Sharma, Sarvpreet Kaur, Mamta Singh, Vinit Kumar, Uttam Sharma, Aklank Jain, Jadala Shankaraswamy, Daisuke Miyoshi and **Sarika Saxena**. Significant structural change in human c-Myc promoter G-quadruplex upon peptide binding in potassium. *RSC Advances*, 2022, 12(13):7594-7604.
6. Nikita Kundu, Taniya Sharma, Sarvpreet Kaur, Aman Kumar Mahto, Rikeshwer Prasad Dewangan, Jadala Shankaraswamy and **Sarika Saxena**. Significant destabilization of human telomeric G-quadruplex upon peptide binding: dramatic effect of flanking bases. *Journal Biomol. Struct Dyn.*, 2022, 29:1-9.
7. Taniya Sharma, Nikita Kundu, Sarvpreet Kaur, Vibha Tandon, Jadala Shankaraswamy and **Sarika Saxena**. Short designed peptide unfolding Human telomeric G-quadruplex mimicking the helicase function. *Journal Biomol. Struct Dyn.*, 2022, 28:1-10.
8. Taniya Sharma, Nikita Kundu, Sarvpreet Kaur, Amlan Chakraborty, Aman Kumar Mahto, Rikeshwer Prasad Dewangan, Jadala Shankaraswamy and **Sarika Saxena**. Recognition and unfolding of human telomeric G-quadruplex by short peptide binding identified from the HRDC domain of BLM helicase. *RSC Advances*, 2022, 12(34):21760-21769.
9. Shikhar Tyagi, Taniya Sharma, Nikita Kundu, **Sarika Saxena**, Sarvpreet Kaur. G-quadruplex motifs in c-Myc promoter region and the role of various small molecule ligands/proteins in stabilizing this promoter region: *International Journal of Pharmaceutical Sciences and Research*, 2021; 12(1): 1000-22.
10. Shikhar Tyagi, Priyansh Srivastava, Taniya Sharma, Nikita Kundu, Sarvpreet Kaur, Jadala Shankaraswamy and **Sarika Saxena**. Screening the binding potential of quercetin with parallel, antiparallel and mixed G-quadruplexes of human telomere and cancer protooncogenes using molecular docking approach. *SN Applied Sciences*, 2020, 2:490.
11. Shikhar Tyagi, Taniya Sharma, Nikita Kundu, Amlan Chakraborty, Sarvpreet Kaur, Daisuke Miyoshi, Jadala Shankaraswamy and **Sarika Saxena**. Selective recognition of

- human telomeric G-quadruplex with designed peptide via hydrogen bonding followed by base stacking interactions. *RSC Advances*, 2019, 9: 40255-40262.
12. J. Shankaraswamy, Shikhar Tyagi, Anju Singh, Daisuke Miyoshi and **Sarika Saxena***, Metal sensitive and DNA concentration dependent structural rearrangement of short oligonucleotide into large suprastructures. *Journal Biomol. Struct Dyn.*, (2019), 1-8.
 13. **Sarika Saxena***, Savita Joshi, J. Shankaraswamy, Shikhar Tyagi, Shrikant Kukreti., Magnesium and molecular crowding of the cosolutes stabilize the i-motif structure at physiological pH. *Biopolymers* (2017), 2-11.
 14. Abhishek Sengupta, Amlan Chkraborty, Monendra Grover and **Sarika Saxena.***, HEPNet: A Knowledge Base Model of Human Energy Pool Network for Predicting the Energy Availability Status of an Individual: *Plos One* 2015, 10(6):e0127918.
 15. **Saxena, S.**, Nagatoshi, S., Miyoshi, D., and Sugimoto, N. Structural and Functional Characterization of RecG Helicase Enzyme under Dilute and Molecular Crowding Conditions. Accepted for publication in *Journal of Nucleic acids*. **2012392039. (Special Annual Issue)**
 16. Pramanik S, Nagatoishi S, **Saxena S**, Bhattacharyya J, Sugimoto N. (2011) Conformational Flexibility influences degree of hydration of nucleic acids. *J Phys Chem B.*, 47: 2790-2
 17. Pramanik S, Nakamura K, Usui K, Nakano S, **Saxena S**, Matsui J, Miyoshi D, Sugimoto N. (2011) Thermodynamic Stability of Hoogsteen and Watson-Crick base pairs in the presence of histone H3 mimicking peptide under molecular crowding condition. *Chem Commun* (Camb). 47:2790-2.
 18. **Saxena, S.**, Miyoshi, D., and Sugimoto, N., (2010) Sole and stable RNA duplexes of G-rich sequences located in the 5'-untranslated region of protooncogenes. *Biochemistry*, 49: 7190-7201.
 19. Kukreti S, Kaur H, Kaushik M, Bansal A, **Saxena S**, Kaushik S, Kukreti R. (2010) Structural polymorphism at LCR and its role in beta-globin gene regulation. *Biochimie*. 92, 1199-206.
 20. Zhang, D. H., Fujimoto, T., **Saxena, S.**, Yu, H.O., Miyoshi, D., and Sugimoto, N., (2010) Monomorphic RNA G-quadruplex and polymorphic DNA G-quadruplex structures responding to cellular environmental factors. *Biochemistry*, 49: 4554-63.

21. M. Kaushik, S. Kaushik, A. Bansal, S. Saxena and S. Kukreti (2011) Structural Diversity and Specific Recognition of four stranded G-quadruplex DNA *Current Molecular Medicine*, 11: 13862–13872.
22. Saxena, S., Bansal, A., Kukreti S. (2008) Structural polymorphism exhibited by a homopurine.homopyrimidine sequence found at the right end of human c-jun protooncogene. *Archives of Biochem. Biophys.* 471(2), 95-108.
23. Kaushik, M., Bansal, A., Saxena, S., Kukreti, S. (2007) Possibility of an Antiparallel (Tetramer) Quadruplex exhibited by the double repeat of the Human Telomere. *Biochemistry*, 46, 7119-7131.
24. Shikhar Tyagi, Sarika Saxena, Nikita Kundu, Taniya Sharma and Sarvpreet Kaur. G-Quadruplex motifs in C-Myc promoter region and the role of various small molecule ligands/proteins in stabilizing this promoter region. *International Journal of Pharmaceutical Science and Research*, 2021, 12, 22-43.
25. Abhishek Sengupta, **Sarika Saxena.**, A computational Model of Mitochondrial Beta-Oxidation Highlighting the Implications on Uremia Disease in Human. *International Journal of Soft Computing and Engineering*, 3, (2014), 2231-2307.
26. Abhishek Sengupta, **Sarika Saxena**, Gaurav Singh, Priyanka Narad, Ayushi Yadav, Monendra Grover. A Computational Systems Biology Approach to Decipher Significant Intricacies of Dihydrolipoamide Dehydrogenase Deficiency in Human. *International Journal of Soft Computing and Engineering*, 4, (2014), 166-170.

Book Links

1. <https://www.amazon.com/Advances-chemical-modifications-role-therapeutics/dp/6139458587>
2. <https://www.flipkart.com/folate-pharmaceutical-perspectives-cancer-therapeutics/p/itm0bea4ffd3f886>

International Conferences

1. Sarvpreet Kaur, Taniya Sharma, Nikita Kundu, Jadala Shankaraswamy, Sarika Saxena* Metal sensitive and DNA concentration dependent structural rearrangement of short oligonucleotide into large suprastructures Amity Institute of Biotechnology. Conceptual Advances in Biophysics and its Applications held at Advanced Centre for Treatment, Research and Education in Cancer, Navi Mumbai, India from **30th March to 1st April, 2022**
2. Taniya Sharma, Nikita Kundu, Sarvpreet Kaur, Jadala Shankaraswamy, Sarika Saxena* Amity University of Biotechnology. Significant destabilization of Human telomeric G-quadruplex by short designed peptide under dilute and molecular crowding conditions: A New Class of Therapeutic Agents. Amity Institute of Biotechnology. Conceptual Advances in Biophysics and its Applications held at Advanced Centre for Treatment, Research and Education in Cancer, Navi Mumbai, India from **30th March to 1st April, 2022.**
3. Nikita Kundu, Taniya Sharma, Sarvpreet Kaur, Jadala Shankaraswamy, Sarika Saxena* Dimeric to Unimolecular structural transition of human c-Myc promoter Gquadruplex upon peptide binding and its transcriptional down-regulation in Human Breast Carcinoma Cells. Amity Institute of Biotechnology. Conceptual Advances in Biophysics and its Applications held at Advanced Centre for Treatment, Research and Education in Cancer, Navi Mumbai, India from **30th March to 1st April, 2022.**
4. Sarika Saxena *6th World Conference on Nanomedical Sciences (2019)*, **Vigyan Bhawan, India.**
5. Sarika Saxena, *Twelfth International Conference on Physics, Chemistry and Biology of Water (2018)*, **Bulgeria, Sofia. (Received Travel grant from Steven Sedmeyer).**
6. Sarika Saxena, *Eleventh International Conference on Physics, Chemistry and Biology of Water (2017)*, **Bulgeria, Sofia. (Winner of Gilbert Ling Poster Award. Only Indian Selected from India and also received travel grant of 500 dollars from the organizer Gerald Pollack).**

7. Daisuke Miyoshi, Dong-Hao Zhang, Takeshi Fujimoto, Sarika Saxena, Hai-Qing Yu, and Naoki Sugimoto, Monomorphic structure of G-rich RNA sequences and polymorphic structure of G-rich DNA sequences responding to cellular environmental factors. **(2010). International Chemical Congress of Pacific Basin Societies, Hawaii.**

8. Sarika Saxena, Daisuke Miyoshi., and Naoki Sugimoto. Sole and stable RNA duplex of G-rich sequences located in 5'-untranslated region of protooncogenes. **(2010) Japan Chemical Society, (Oral presentation) March.**

9. Sarika Saxena, Daisuke Miyoshi and Naoki Sugimoto. Highly polymorphic unstable to highly monomorphic stable: Structural mystery of GC rich DNA and RNA sequences under cell mimicking conditions. **(2009) FIBER FORUM, Frontier Institute for Biomolecular Engineering Research, Konan University, 8-9-1 Okamoto, Higashinada-ku, Kobe 658-8501, Japan.**

Status of Ph.D. Students:

PhD students supervised : 5

International Collaborations

1. I am already working with **Prof. Daisuke Miyoshi, FIBER, FIRST, Konan University, Japan** and recently we published three papers together two in RSC Advances and Journal of Biomolecular Structural Dynamics I have also published another four papers with him in past few years.

2. I am also doing collaborative work with **Dr. Amlan Chakraborty**, Division of Immunology, Immunity to Infection and Respiratory Medicine (DIIRM), School of Biological Sciences, University of Manchester, Manchester, England

3. **Dr. Suprakash Dutta** from York University, Canada co-supervisor of my Ph.D. student Shikhar Tyagi

4. **Dr. Shoizeb Haider**, Rudolph Peters Building, Department of Biochemistry, South Parks Road, The University of Oxford, Oxford Ox1 3QU (Will start Bioinformatics work with him very soon, waiting for my peptide PDB to generate).

5. **Dr. Francesca Ripanti**, Dipartimento di Fisica e Geologia ,Via Alessandro Pascoli, 06123 Perugia (Italy) (Will start Raman Spectroscopy work with her very soon work in under progress).

Indian Collaborator of Central and State Universities

- 1. Prof. T.P. Singh (AIIMS)** (recently we started working together for SPR and X-Ray Crystallographic data).
- 2. Prof. Vibha Tandon (JNU)** (recently we submitted paper in Biochemistry, ACS).
- 3. Dr. Aklank Jain** (Associate Prof. in Central University, Bathinda (published recently in RSC advances, he is also co-supervisor for my Ph.D. student).
- 4. Dr. Shweta Singh (INMAS)** (she is a co-supervisor and I will start cellular work very soon with her, waiting for peptide to be received).

Administrative Work:

1. Course Coordinator of Biophysics, Biophysics and Structural Biology and Introduction of Biophysics, to both UG and PG students
2. Member of instrument repair committee, IQAC
3. Program Leader of B.Sc. Zoology, B.Sc. Zoology + B.Ed., B.Sc. Zoology Research.
4. Question paper setter, question paper evaluator.
5. Mentor.
6. IFC of NTCC and Term Paper..
7. Evaluator of term paper and summer training reports.
8. Designed course for Molecular Biophysics and Structural Biology.
9. GSSC students mentorship.
10. SRC member for Ph.D. students.

Place: Delhi, India

Dr. Sarika Saxena

Signature of the applicant