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- **EDUCATIONAL/PROFESSIONAL QUALIFICATION**: **PhD**, All India Institute of Medical Sciences, New Delhi, India

  MSc: Jamia Hamdard, New Delhi, India
- **FIELDS OF TEACHING:** Biochemistry, Proteomics and Protein Engineering
- **RESEARCH AREA** : Structure Biology & Structure Based Drug Design
- **RESEARCH PUBLICATIONS -International Journals** (39)

1. Mir R, **Singh N**, Vikram G, Sinha M, Bhushan A, Kaur P, Srinivasan A, Sharma S, Singh TP.(2010) Structural and binding studies of C-terminal half (C-lobe) of lactoferrin protein with COX-2-specific non-steroidal anti-inflammatory drugs (NSAIDs). **Arch. Biochem. Biophys.** 2010 500(2):196-202.
2. Kumar, S**., Singh N,** Sinha M, Dube D, Singh SB, Bhushan A, Kaur P, Srinivasan A, Sharma S, Singh TP. Crystal structure determination and inhibition studies of a novel xylanase and alpha-amylase inhibitor protein (XAIP) from Scadoxus multiflorus. **FEBS J.** 2010 Jul;277(13):2868-2882.
3. Mir R, Kumar RP, **Singh N**, Vikram GP, Sinha M, Bhushan A, Kaur P, Srinivasan A, Sharma S, Singh TP (2010).Specific interactions of C-terminal half (C-lobe) of lactoferrin protein with edible sugars: binding and structural studies with implications on diabetes. **Int. J. Biol. Macromol.** 47(1):50-59.
4. Singh, A.K., **Singh, N**., Sinha, M., Sharma, S., Kaur, P., Srinivasan, A. and Singh, T.P. (2010). First structural evidence of mode of diffusion of aromatic ligands and ligand induced closure of hydrophobic tunnel in heme peroxidases. **J. Bio. Inorg. Chem**. 1099-1107.
5. **Singh, N**., **Singh, A.K**., Sinha, M., Sharma, S., Kaur, P., Srinivasan, A. and Singh, T.P. (2009). Mode of ligand-binding and assignment of subsites in mammalian peroxidase: Crystal structures of complex of lactoperoxidase with acetylsalicylic acid, selicylhydroxamic acid and benzylhydroxamic acid. **J. Biol. Chem. 284, 20311-20318.**
6. Singh, A.K., Kumar, R.P., Pandey, N., **Singh, N**., Sinha, M., Kaur, P., Sharma, S. and Singh, T.P. (2010). Mode of the binding of the tuberculosis prodrug isoniazid to peroxidases: Crystal structure of bovine lactoperoxidase with isoniazid at 2.7Å resolution. **J. Biol. Chem. 285, 1569-1576.**
7. Mir, R., **Singh, N.**, Gopalakrishana pillai, V., Kumar R.P., Sinha, M., Bhushan, A., Kaur, P., Srinivasan, A., Sharma, S. and Singh, T.P. (2009) Structural Basis of the Prevention of NSAID- Induced Damage of the Gastrointestinal Tract by C-Terminal Half (C-lobe) of Bovine Colostrum Protein Lactoferrin : Binding and Structural Studies of C-lobe Complexes with Indomethacin, Diclofenac, Aspirin and Ibuprofen. **Biophysical J**. **97, 3178-3186**. **(Journal cover page)**

8. **Singh N**., Prem Kumar, R., Kumar, S., Sharma S., Mir, R., Kaur, P., Srinivasan, A. and Singh T.P. (2009). Simultaneous inhibition of anti-coagulation and inflammation: Crystal structure of phospholipase A_2 complexed with indomethacin at 1.4Å resolution reveals the presence of the new common ligand binding site. **J. Mol. Recognit**. **22, 437-445.**
9. Kumar, S., **Singh,** N., Sinha. M, Sharma, S, Kaur, P., Srinivasan, A. And Singh, T.P. (2009). Isolation, purification, crystallization and preliminary crystallographic studies of a plant-pathogenesis related protein, amaryllin from *amaryllis belladonna.* **Acta Crystallogr. F65, 635-637.**
10. Sheikh, I.A., Singh, A.K., **Singh, N**., Sinha, M., Sharma, S., Kaur, P., Srinivasan, A. and Singh, T.P. (2009). Structural evidence of substrate-specificity in mammalian peroxidase: Crystal structure of the complex of lactoperoxidase with thiocyanate at 2.4 Å resolution. **J. Biol. Chem**. **284, 14849-14856.**
11. Mishra, P., Prem Kumar, R., Ethayathulla, A., **Singh, N.,** Sharma, S., Perbendt, M., Betzel, C., Kaur, P., Srinivasan, A., Bhakuni, V. and Singh, T.P. (2009). Crystal structure of a phage encoded hyaluronate lyase and its complexes with lactose and ascorbic acid reveals the substrate-binding channel. **FEBS J. 276, 3392-3402. (Journal cover page)**
12. Kumar, V., Roske, Y., **Singh, N**, Heinemann, U., Singh, T. P. and Yadav, S. (2009). Purification and X-ray crystallographic preliminary studies of β-microsemino protein from human seminal plasma. **Acta Crystallogr. F65, 518-521.**
13. Sharma, P., **Singh, N**., Sinha, M. Sharma, S., Perbendt, M., Betzel, C., Kaur, P., Srinivasan, A. and Singh, T.P. (2009). Tryptophan as a three-way switch in regulating the function of the secretory signalling glycoprotein (SPS-40) from mammary glands: crystal structure of SPS-40 complexed with 2-methyl-pentane-2,4 diol at 1.6 Å resolution. **Acta Crystallogr. D65**. **375-378.**
14. Singh, A. K., **Singh, N**., Sharma, S. and Singh T. P. (2009). Inhibition of peroxidase by its catalytic product: Crystal structure of the hypothiocyanate-inhibited lactoperoxidase at 2.3Å resolution. **Biophysical. J., 96, 646-654**.
15. Sharma, P., **Singh, N**., Sinha, M. Sharma, S., Perbendt, M., Betzel, C., Kaur, P., Srinivasan, A. and Singh, T.P. (2008).Crystal structure of the peptidoglycan recognition protein at 1.8Å resolution reveals dual strategy to combat infection through two independent functional homodimers. **J. Mol. Biol. 378, 921-930.**
16. Singh, A. K., **Singh, N**., Sharma, S., Singh, S.B., Kaur, A, Srinivasan, A. and Singh T. P. (2008). Crystal structure of goat lactoperoxidase at 2.4Å resolution. **J. Mol. Biol. 376. 1060-1075.**
17. Mir, R. Sinha, M., Sharma, S., **Singh, N**., Kaur, P., Srinivasan, A and Singh, T. P. (2008). Isolation, purification, crystallization and preliminary crystallographic studies of sagitoxin, an oligomeric cardiotoxin fron *naja naja saggitifera*. **Acta Crystallogr. F64, 545-547.**
18. Hasan, M.I., Kumar, V., **Singh, N**., Yadav, S., Kaur, P and Singh, T. P. (2008). Crystal structure of the novel complex formed between Zinc a2-glycoprotein (ZAG) and Prolactin inducible protein (PIP) from human seminal plasma. **J. Mol. Biol. 384, 663-672.**
19. Jain, R., Sharma, P., **Singh, N.,** Sharma, S., Kaur, P. and Singh, T. P. (2008). Crystal Structure of the Complex of Cameline Peptidoglycan Recognition Protein with Disaccharide at 3.2Å Resolution. **Biophysical Journal 94: 3256.**

20. Sharma, P., **Singh, N.,** Sinha, M., Sharma, S., Perbendt, M., Betzel, Ch., Kaur, P., Srinivasan , A. and Singh, T. P. (2008). Crystal Structure of Peptidoglycan Recognition Protein at 1.8Å Resolution. **Acta Cryst**. **A64, C314**

21. **Singh N**., Somvanshi, R. K.., Sharma S., Kaur, P. and Singh T.P. (2007). Structural Elements of Ligand Recognition Site in Secretory Phospholipase A_2 and Structure-Based Design of Specific Inhibitors. **Cur. Topics Med. Chem. 7, 757-764.**

22. Kumar, J., Ethayathulla, A. S., Srivastava, D. B., **Singh, N.**, Sharma, S., Kaur, P. and Singh, T. P. (2007). Carbohydrate Binding Properties of Goat Secretory Glycoprotein (SPG-40) and its Functional Implications: Crystal Structures of the Native Glycoprotein and its Four Complexes with Chitin - Like Oligosaccharides. **Acta Crystallogr. D63, 437-446.**

23. **Singh N.,** Jabeen T., Pal, A., Sharma S., Betzel Ch. and Singh T. P. (2006). Regulation of phospholipase A_2 activity by plant originated compounds: Crystal structures of the complexes of phospholipase A_2 with anisic acid and atropine at 1.3 and 1.2 Å resolution respectively. **Proteins: Struct. Funct. Bioinformatics 64, 89-100.**

24. **Singh N.,** Jabeen T., Sharma S. and Singh T. P. (2006). Phospholipase A_2 is a target molecule for the action of non-steroidal anti-inflammatory drugs: Crystal structure of the complex of phospholipase A_2 with diclofenac drugs at 2.7 Å resolution. **Acta Crystallogr. D62, 410-416.**

25. Jabeen, T., **Singh, N.,** Sharma, S., Singh, R.K., Jasti, J., Kaur, P., Srinivasan, A. and Singh T.P. (2006). Crystal structure of a C49 phospholipase A_2 from Indian cobra reveals carbohydrate binding in the hydrophobic channel. **Proteins: Struct. Funct. Bioinformatics 62, 329-337.**

26. Sharma M., Ethayathulla A. S., Jabeen T., **Singh, N**., Sarvanan K., Yadav S., Sharma S., Srinivasan A. and Singh, T. P. (2006). Crystal structure of a highly acidic neurotoxin from scorpion *buthus tamulus* at 2.2 Å resolution reveals novel structural features. **J. Struct. Biol. 155, 52-62.**

27. Srivastava, D. B.., Ethayathulla, A. S., Kumar, J., **Singh, N.,** Sarvanan K., Sharma S., Srinivasan A. and Singh, T. P. (2006). Crystal structure of signalling protein (SPS-40) from sheep. **J. Struct. Biol. 156, 505-516.**

28. **Singh N.,** Jabeen T., Bilgrami S., Sharma S., Roy I., Gupta M.N., Somvanshi, R., Dey, S. , Srinivasan, A. and Singh T.P. (2005). Detection of native peptides as potent inhibitors of enzymes: Crystal structure of the complex formed between the treated bovine α-chymotrypsin and an autocatalytically produced fragment Ile-Val-Asn-Gly-Glu-Glu-Ala-Val-Pro-Gly-Ser-Trp-Pro-Trp at 2.2 Å resolution. **FEBS J. 272, 562-572.**

29. Jabeen, T. Sharma, S., **Singh, N**., Singh, R.K., Kaur P. and Singh T.P. (2005). Crystal Structure of a calcium dimer phospholipase A_2 from venom of *Naja naja sagittifera* at 1.6Å resolution. **Proteins: Struct. Funct. Bioinformatics 59, 856-863**.

30. Jabeen T., Sharma, S., **Singh N**., Singh, R.K. and Singh T.P. (2005). Crystal structure of a zinc-induced cobra venom phospholipase A_2 dimer at 2.7Å resolution. **Acta Crystallogr. D61, 302-308.**

31. Jabeen, T., Sharma, S., **Singh, N**., Bhusan, A. and Singh T. P. (2005). Structure of the zinc-saturated C-terminal lobe of bovine lactoferrin at 2.0 A resolution. **Acta Crystallogr. D61, 1107-1115 (Journal Cover page).**

32. Singh R.K., **Singh N**., Jabeen T., Sharma S., Dey S. and Singh T.P. (2005). Crystal structure of the complex of group I PLA_2 with a group II-specific peptide Leu-Ala-Ile-Tyr-Ser (LAIYS) at 2.6 Å resolution. **J. Drug Target. 13, 367-374**.

33. Jabeen T., **Singh N**., Sharma, S., Singh, R.K. and Singh T.P. (2005). Crystal structure of the complex formed between cobra venom phospholipase A_2 and a non-steroidal anti-inflammatory drug, niflumic acid at 2.5 Å resolution. **Acta Crystallogr. D61, 1579-1586.**

34. Jain R., Kumar S., **Singh N**., Sharma S. and Singh T.P. (2005). Characterization of proteins from human pleural fluid. **Eur. Biophys. J. 34, 825.**

35. Srivastava D.B., Kumar J., Srivastava P., Mandal A., Jain R., Jabeen T., **Singh N**., Sharma S., Srinivasan A. and Singh T.P. (2005). Clinical Proteomics: characterization and structural studies of new proteins from human body fluids and tissues. **Eur. Biophys. J**. **34, 773.**

36. Jabeen, T., **Singh, N**., Sharma, S., Srinivasan, A. and Singh T. P. (2005). Crystal structure of a novel phospholipase A_2 from *Naja naja sagittifera* with a strong anticoagulant activity. **Toxicon 46, 865-875.**

37. Singh, N., Sarvanan, K., Paramasivam, M., Sharma, S., Srinivasan, A. and Singh T. P. (2005). Purification and partial characterization of neurotoxins from Indian r ed scorpion venom and cloning of toxin cDNAs. **Ind. J. Phys. 6, 77-86**.

38. Singh N., Jabeen T., Sharma S., Somvanshi, Rishi, Dey, S. and Singh T.P. (2004). Phospholipase A_2 is a target for action of non-steroidal anti-inflammatory drugs (NSAIDs): Crystal structure of the complex formed between Russell's viper PLA_2 and an anti-inflammatory agent oxyphenbutazone at 1.6Å resolution. **Biochemistry 43, 14577-14583**.

39. Sharma A. K., Kumar S., Sharma V., Nagpal A.**, Singh N**., Tamboli I., Mani I., Raman G., Singh T. P. (2001). Lactoferrin-melanin interaction and its possible implications in melanin polymerization: Crystal structure of the complex formed between mare lactoferrin and melanin monomers at 2.7Å resolution. **Proteins: Struct. Funct. Genet. 45, 229-236.**

➢ AWARDS & ACHIEVEMENTS

1. National Academy of Sciences of India (NASI) young scientist award-2009
2. DST-young scientist fellowship-2005
3. Talekar Medal for the best PG thesis in Department of Biophysics, AIIMS
4. Awarded "Meeting of Noble Laureates and Students" in the field of medicine by DST, June-July 2003, Lindau, Germany
5. Best paper of the year award for 2006, by Society of young Scientist, AIIMS
6. CSIR-Senior Research fellowship (2002)
7. CSIR-Junior Research fellowship and NET-UGC (1999)
8. Graduate Aptitude Test in Engineering (GATE-IIT)-1999
9. Best Poster award in 5th Biotech Research Society of India (BRSI) conference- 2008, Hyderabad
10. Best Presentation award in Indian Biophysical Symposium (IBS-2004), Bangalore
11. Best Presentation award in International Biophysics Congress-2005 Montpellier, France

➢ PROJECT FUNDING: 02

***(a) Structure based ligand design of anti-inflammatory drugs using phospholipase A_2 and cycloxyhenase-2 enzymes as target molecules*" (**2005 - 2008), Department of Science and Technology, Ministry of S&T, India.

(b) "*Structural and functional studies of plant defence proteins*" (2011-ongoing), Department of Science and Technology, Ministry of S&T, India.

- **Talk/Presentation/Conferences attended/Seminar/Symposia/Workshop**:

  International Conferences: 14

  National Conferences: 12

- **PROFESSIONAL AFFILIATION**:
  1. Member of Indian Biophysical Society
  2. Member of Indian Crystallographic Association

- **NO. OF PATENTS**: 04