



AVNEET SAINI

Department of Biophysics,
Basic Medical Science Block II,
South Campus, Sector 25
Panjab University,
Chandigarh 160014
India

Email: avneet@pu.ac.in

Website: <https://www.avneetsaini.com/>

Office: +91-0172-2534119

Mobile: +91-9876442266

Web : <http://biophysics.puchd.ac.in/>
<https://scholar.google.co.in/citations?user=QmmPnLEAAAAJ>
https://www.researchgate.net/profile/Avneet_Saini
<https://orcid.org/0000-0002-1101-8623?lang=en>
<http://www.scopus.com/authid/detail.url?authorId=56590952900>

EDUCATION

- Ph.D., Biophysics, 2011
Department of Biophysics, Panjab University, Chandigarh, India. Title: ***“Peptoids as Antimicrobial and Collagen Mimetics: A Computational Study”***.
- Master of Science (Honours School), Biophysics, 2005 (University Medal) Department of Biophysics, Panjab University, Chandigarh, India

WORK EXPERIENCE

- Assistant Professor, Department of Biophysics- Panjab University, Chandigarh, July 2010-till date.
- Post-Doctoral Research Fellow, Institute of Structural and Molecular Biology, University College London, United Kingdom March 18, 2014-March 17, 2015
- Assistant Professor, Department of Bioinformatics- GGSDS College, Chandigarh, July 2007- July 2010.
- Department of Biotechnology (DBT), India- Junior Research Fellow, March 2006 - June 2007.

AWARDS & HONORS

- Awarded International Travel Award from Schlumberger Foundation for presenting *“In silico designing and In vitro Biovalidation of Novel Peptide Analog from Chicken Cathelicidin-2”* at the Faculty for the Future Fellows and Alumnae Forum, **Abu Dhabi, UAE, 2018.**

- Awarded the prestigious ‘Faculty for the Future International Fellowship’ of USD 40,000 by the Schlumberger Foundation for the year **2013-14** to carry out Post-doctoral research work at University College London, United Kingdom.
- International Travel Award from Panjab University to participate in the “RSC Macrocyclic and Supramolecular Chemistry Meeting (MASC11)”, held at the University of Bath, Bath- **United Kingdom** from December 19th – 20th Dec’ **2011**
- International Travel Award from Department of Biotechnology, Government of India for participating in the 6th Asian Biophysics Association Symposium, **Hong Kong**, January **2009**.
- *University Medal* for standing first in M. Sc. (Hons. School) Biophysics, Panjab University.
- *University Medal* for standing first in B. Sc. (Hons. School) Biophysics, Panjab University.
- *Certificate of Merit* for outstanding academic performance & being among the top 0.1% of successful candidates in Mathematics, of All India Secondary School Examination.
- *Awarded National Scholarships thrice* for maintaining excellent academic record in secondary school examination, B. Sc. (Hons. School) and M. Sc. (Hons. School) in 1997, 2003 & 2004 respectively.

ACADEMIC POSITIONS

- **Warden**, Working Women Hostel, Panjab University, Chandigarh July **2018-** till date
- **Coordinator**, Choice Based Credit System, Basic Medical Sciences, Panjab University, Chandigarh **2016-till date**.
- **Member Organizing Committee**, National Conference on “Role of Biophysics in Academia and Industry”, Panjab University Chandigarh **2017**, 12-13 October
- **Member Venue and Stage Committee**, 10th Chandigarh Science Congress 2016 Panjab University, Chandigarh **29-2-2016 to 2-03-2016**.
- **Organizing Committee Member**, National Seminar on “Biophysical Techniques in Drug Design and Disease”, Panjab University Chandigarh **2016**, 30th January.
- **Member of Executive Council** of Panjab University Teachers’ Association (PUTA), Chandigarh **2015- 2016**.
- **Time Table Incharge**, Department of Biophysics, Panjab University, Chandigarh July **2015- till date**
- **President, Biophysical Society**, Department of Biophysics, Panjab University, Chandigarh **2011**.

- **Placement Officer**, Department of Biophysics, Panjab University, Chandigarh **2010-Nov 2018**.
- Member of Academic Committee, Technical Committee and Administrative Committee of the Department of Biophysics, Panjab University, Chandigarh.

RESEARCH INTERESTS

The underlying theme of our research is Design and Structural Characterization of novel peptides/peptidomimetics to solve the challenges posed by the existing molecules, and the use of a range of Computational Biology, Molecular Biophysics and Biophysical Chemistry Techniques to analyze these macromolecules and their interactions with the target.

We have also extended our research in the field of Bioconjugates. The modification of graphene with active peptides extends the potential applications of graphene materials in various fields. The bound bioconjugate could improve the biocompatibility and bio-recognition ability of graphene-based nano-composites, and hence, greatly enhance their biosensing performances on both selectivity and sensitivity.

Many of our projects are directed towards biological problems of therapeutic and diagnostic relevance, and we have an extensive network of interdisciplinary collaborations, within Panjab University, at other institutions, and with industry.

RESEARCH PROJECTS

- Studies on the consequences and prevention of the intra cellular amyloid B-aggregation and cognitive decline in progression of Alzheimer's disease. Department of Science & Technology-Cognitive Science Research Initiative (2019).
- Design and Development of Novel Peptides/Peptoids against selected pathogens. Defense Research and Development Organization (DRDO) (2017). Rs 59, 52, 876/-.
- Design and Bio validation of novel antimicrobial peptides. UGC-BSR (2016).

RESEARCH PUBLICATIONS

- Joshi S, Siddiqui R, Sharma P, Kumar R, Verma R, **Saini A**. Green synthesis of peptide functionalized reduced graphene oxide (rGO) nano bioconjugate with enhanced antibacterial activity. **Scientific Reports**. 2020;10:9441. DOI: 10.1038/s41598-020-66230-3.
- Sharma S, Saini R, Sharma P, **Saini A**, Nehru B. Maintenance of Amyloid-beta Homeostasis by Carbenoxolone Post A β -42 Oligomer Injection in Rat Brain. **Neuroscience**. 2020;431:86-102. DOI: 10.1016/j.neuroscience.2020.02.004.
- Joshi S, Sharma P, Siddiqui R, Kaushal K, Sharma S, Verma G, Saini A. A review on peptide functionalized graphene derivatives as nanotools for biosensing. **Microchimica Acta**. 2020;187(1):27. DOI: 10.1007/s00604-019-3989-1.
- Ankush Parmar, Panchali Barman, Gurpreet Kaur, **Avneet Saini**, Shweta Sharma. Biogenic Synthesis of Carbon-Based Micro Composites from Mushroom (*Asparagus Disporus*). **Material Today: Proceedings**. 2020;21:1862-7. DOI: 10.1016/j.matpr.2020.01.242.
- Sheetal Sharma, Neha Sharma, **Avneet Saini**, Bimla Nehru, Carbenox olone Reverses the Amyloid Beta 1-42 Oligomer-Induced Oxidative Damage and Anxiety-Related Behavior in Rats. **Neurotoxicity Research**. 2019;35(3):654-667. DOI: 10.1007/s12640-018-9975-2.
- Divya Goyal, **Avneet Saini**, G. S. S. Saini and Rajesh Kumar. Green synthesis of anisotropic gold nanoparticles using cinnamon with superior antibacterial activity. **Materials Research Express**. 2019;6(7):075043. DOI: 10.1088/2053-1591/ab15a6.
- Sheetal Sharma, Bimla Nehru, **Avneet Saini**. Inhibition of Alzheimer's amyloid-beta aggregation in-vitro by carbenoxolone: Insights into mechanism of action. **Neurochemistry International**. 2017;108:481-493. DOI: 10.1016/j.neuint.2017.06.011.
- Sheetal Sharma, Sonia Verma, Monika Kapoor, **Avneet Saini**, Bimla Nehru. Alzheimer's disease like pathology induced six weeks after aggregated amyloid-beta injection in rats: increased oxidative stress and impaired long-term memory with anxiety-like behavior. **Neurological Research** 07/2016; DOI: 10.1080/01616412.2016.120933
- **Saini A**. Structural Modeling and Conformational Analysis of Aromatic Polypeptoid Models confined to different environmental conditions. **International Journal of Computer Applications**. 2016;143(7):46-56. DOI:10.5120/ijca2016910265
- **Saini A**, Sharma S, Jaswal RR. Non-covalent interactions guide the structural plasticity of Desmin Tubulin binding peptides: A Molecular Mechanics and Molecular Dynamics Study. **International Journal of Peptide Research and Therapeutics** 2015 DOI: 10.1007/s10989-015-9474-8.
- Nandel FS, Jaswal RR, **Saini A**, Nandel V, Shafique M. Construction and conformational behavior of peptoids with *cis*-amide bond geometry: design of

a peptoid with alternate φ , ψ values of *inverse* PP-II/PP-II and PP-I structures. **Journal of Molecular Modeling**. **2014**;20:2429.

- **Saini A**, Jaswal RR, Negi R, Nandel FS. Insights on the structural characteristics of Vim-TBS (58-81) peptide for future applications as a cell penetrating peptide. **BioScience Trends**. **2013**;7:209-220. DOI: 10.5582/bst.2013.v7.5.209.
- **Saini A**, Bansal R. Insights on the Structural Characteristics of NDM I: The Journey so far. **Advances in Biological Chemistry**. **2012**;3:323-334. DOI: 10.4236/abc.2012.24040.
- Nandel FS and **Saini A**. Peptoids with aliphatic sidechains as helical structures without hydrogen bonds and collagen/ *inverse*-collagen type structures. **Journal of Biophysical Chemistry**. **2011**;2:37-48. DOI:10.4236/jbpc.2011.21006.
- Nandel FS and **Saini A**. Conformational Study of Short peptoid models for future applications as potent antimicrobial compounds. **Macromolecular Theory and Simulations**. **2007**;16:295-303. DOI: 10.1002/mats.200600080
- Nandel FS and **Saini A**. Construction and Design of Single Strand Collagen like Structure. **Indian Journal of Biochemistry and Biophysics**. **2007**;44:106-113.

BOOK CHAPTERS

- Jaswal RR, Kaushal K, Joshi S, Sharma P, Sharma S, Preet S, **Saini A**. Exploring the Potential of peptides and peptidomimetics in Biosensing. In Strategies to Overcome Superbug Invasions: Emerging Research and Opportunities. IGI Global (**2019**). ISBN10:1799803074, ISBN13:9781799803072
- Tripathi R, Sharma P, **Saini A**, Verma G. Self-healed Materials from Elastomeric Composites: Concepts, Strategies and Developments. In Smart Polymer Nanocomposites (**2017**) Pg 219-242. Springer International Publishing. Print ISBN: 978-3-319-50423-0, Electronic ISBN: 978-3-319-50424-7.
- **Saini A** and Verma G. "Peptoids: Tomorrow's Therapeutics". In Nanostructures for Novel Therapy: Synthesis, Characterization and Applications. (**2017**). Chapter 10, Pg 251-280. Elsevier Publications. ISBN: 978-0-323-46142-9.

Ph.D. GUIDANCE

PhD Students

- Jyoti, Enrolled 2019
- Panchali Barman, Enrolled 2019
- Sandeep Saini, Enrolled 2018
- Shubhi Joshi, Enrolled 2017
- Pratibha Sharma, Enrolled 2016
- Sheetal Sharma, (2012-2017)

M.Sc. Students

- Ruby Siddiqui, 2018-2019. Synthesis and Characterization of Reduced Graphene Oxide and its Peptide Conjugate: A Versatile Tool with Improved Antibacterial Efficacy
- Puneet Kaur, 2017-18. Comparative Pharmacophore Modeling of Tubulin Binding Drugs: A Study Based on Virtual Screening, Molecular Docking and MD Simulations.
- Aindrilla Chatterjee, 2016-17. Solvent Effects on the Secondary Structure of an Antimicrobial Peptide Derived from Chicken Cathelicidin-2: Structural Insights from In-Silico Studies.
- Aakarshan Datta, 2016-17. Molecular Simulations to study the Effect of Temperature on the Conformation and Interactions of Chicken Cathelicidin-2 Derived Peptide.
- Reetika Sahore, 2015-2016. Identification of Novel Tubulin Inhibitors: A Virtual Screening, Molecular Docking and Molecular Dynamics Study
- Sukriti Sharma, 2012-2013. Conformational Studies of Tubulin Binding peptides derived From the Intermediate Filament Protein Desmin.
- Riteshwari Negi, 2011-2012. Conformational Analysis of Vimentin-Tubulin Binding Site Peptide for Its Putative Cell Penetrating Properties.
- Rohit Bansal, 2011-2012. In silico Analysis of the Active Site Loop Regions of New Delhi Metallo- β -Lactamase.
- Tapish Malik, 2011-2012. Structural Characteristics of Tubulin Binding Site Peptides: A Computational Study.

FACULTY DEVELOPMENT COURSES

- Attended the Short Term Course on Environmental Awareness at UGC-Human Resource Development Centre, Panjab University, Chandigarh. 18 Jan 19 to 24 Jan 2019.
- Attended the Short Term Course in Research Methodology at UGC-Human Resource Development Centre, Panjab University, Chandigarh. 25 Sep 2018 to 1 Oct 2018.
- Attended the UGC Sponsored Refresher Course in Research Methodology (Interdisciplinary) Panjab University, Chandigarh. 1 Sep 2015 to 21 Sep 2015.
- Attended the Refresher Course on 'Research Methodology in Science' organized by the Department of Biochemistry and Academic Staff College, Panjab University Chandigarh. 23 Nov-13 Dec 2012.
- Participated in the 93rd Orientation Course organized by ASC, Panjab University from 22 Feb 2012 to 20 March 2012.

INVITED TALKS

- Resource Person on National Science day; 28.02.2019 at Amar Shaheed Baba Ajit Singh Jujhar Singh Memorial College, Bela, Ropar, Punjab. Delivered a talk on the National Theme "Science for the people and people for the Science".
- Invited as Resource Person at D.A.V. College Jalandhar on 15.02. 2010 to deliver an expert talk on "Bioinformatics, Molecular Modelling and Drug Designing".

CONFERENCES AND WORKSHOPS

- Attended and **Presented** my work "Novel Antimicrobial Peptides: Designing to Expansion as Bioconjugates with Graphene-based Nanomaterials" at ICONICA 2020 A Global Summit on Next-Gen Paradigms in Health Care held at Panjab University, Chandigarh. 12-14 February, **2020 (Oral Presentation)**.
- Attended International Workshop Scheme for Promotion of Academic and Research Collaboration (SPARC) at Panjab University, Chandigarh. 31 October **2019**.
- Participated in Microcon Punjab Startup Fest 2019 and International conference on Microbial Biotechnology held at Panjab University, Chandigarh. March 6-8, **2019**.
- Invited to **Present** my Work "*In silico* designing and *In vitro* Biovalidation of Novel Peptide Analog fom Chicken Cathelicidin-2" at the Faculty for the Future Fellows and Alumnae Forum, **Abu Dhabi**, UAE 18 -21 Nov, **2018**.
- Participated in the Global Initiative for Academic Networks Workshop Course on Genome Informatics held at UIET, Panjab University, Chandigarh. October 3-8, **2018**.
- Attended and **Presented** my work "Identification of Novel Tubulin Inhibitors: A Virtual Screening, Molecular Docking and Molecular Dynamics Study" in the Annual Symposium of the Indian Biophysical Society (IBS **2017**) held at IISER Mohali, India during March 23-25, **2017**.
- Symposium **Invited Speaker** at the XXXIII Annual Conference of the Indian Academy of Neuroscience. "Neuroscience Research from Mechanisms to Applications" 2015, 31Oct-2 Nov, **2015**.
- National Biophysics Symposium on 'Recent Perspectives in Biophysics' Organized by the Department of Biophysics, PGIMER, Chandigarh. May 11, **2013**.
- National Symposium on "Recent Trends in Cancer Research" organized by the Department of Biophysics, Panjab University Chandigarh. March **2013**.
- Participated in the Workshop on 'Hands on training in Patent Searching', organized by CIPP, Panjab University Chandigarh. 23rd Feb **2013**.
- **Invited for Poster Presentation:** Conformational Characterization of Peptoids using QM and MD Approaches, Avneet Saini, F.S. Nandel; 2011 RSC

Macrocyclic and Supramolecular Chemistry Meeting (MASC11), organized by the Department of Chemistry at the University of Bath, Bath- **United Kingdom** from December 19th – 20th Dec' **2011**

- Attended the National Workshop on “In silico Approaches for Designing Bioactive Peptides” organized by Bioinformatics Centre at IMTECH, Chandigarh from 18th – 21st Oct' **2011**.
- Participated in the National Seminar on Recent Advances in Oral Controlled Drug Delivery System, organized by Amar Shaheed Baba Ajit Singh Jujhar Singh Memorial College of Pharmacy, Bela (Ropar) Punjab on 1st Oct' **2011**.
- Attended the 13th Punjab Science Congress: Climate Changes, Concerns and Solutions, **2010**; Chandigarh, India
- ‘Conformational Preferences of Peptoids’, 6th Asian Biophysics Association Symposium, **Hong Kong**, January **2009**, (*Poster presentation*).
- ‘Conformational Preferences of Water Solvated Antimicrobial Peptoid Designs: Molecular Dynamics Simulations’, National Symposium on Biophysics ‘Biophysics in Medicine and Biology, **2007**, Chandigarh (*Oral presentation*).
- Attended the National Workshop on “Computational Approaches for Predicting Molecular Interactions” organized by Bioinformatics Centre at IMTECH, Chandigarh from 9th – 12th Oct'2007.
- ‘Peptoids as Antimicrobial Mimetics – A Computational Study’, Saini A., Nandel F. S.; National Symposium on Biophysics: Trends in Biomedical Research 2007; New Delhi; India. (*Poster Presentation*)
- ‘Construction and Conformational Study of Antimicrobial Peptoid Mimics’, Saini A., Nandel F. S.; Indian Biophysical Society Meet 2006, Kolkata; India. (*Poster Presentation*)
- ‘Designing and Conformational Study of Magainin Mimics- Peptoids’, Saini A., Nandel F. S.; National Conference on Thermodynamics of Chemical and Biological Systems 2005, Amritsar; India. (*Oral Presentation*)
- ‘Construction of Biomimetic peptides containing unusual amino acid t-Leu’ Nandel F. S., Saini A.; National Conference on Thermodynamics of Chemical and Biological Systems 2005, Amritsar; India. (*Poster Presentation*)
- Participated in The 91st Session of Indian Science Congress Association (2004), Chandigarh; India.
- Participated in the National Symposium on Oxidative Stress (2003), Chandigarh; India.

MEMBERSHIPS

- Life Member of ‘Indian Biophysics Association’.
- Life Member of ‘Indian Association of Biomedical Scientists’.