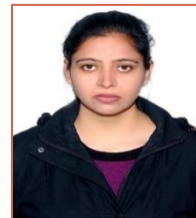


**Harmandeep Kaur Gulati**

M. Pharm, Ph.D. (Pursuing)

E-mail: [harman1491@gmail.com](mailto:harman1491@gmail.com)

Contact no: 91-7837600808

**Research Background**

My research endeavours have so far focused on the design, synthesis and biological evaluation of inhibitors targeting various enzymes. In my research work, various molecules that are anticipated to have potential as anti-Alzheimer, anti-hyperuricemic and anti-microbial agents were rationally designed and synthesized by various organic chemistry methods. I am experienced in using a wide range of characterization techniques such as  $^1\text{H}$  NMR,  $^{13}\text{C}$  NMR, mass spectrometry, infrared spectroscopy and UV spectroscopy. I also have experience of using structural elucidation via sophisticated techniques for structure interpretation. Being a medicinal chemist, I also have experience in the *in vitro* biological evaluation of the molecules. The assays I have performed were based on ELISA, UV spectroscopy, colorimetry. With the results of the biological evaluation in hand, I proposed the structure-activity relationship for the synthesized compounds. The establishment of a structure- activity relationship helped me to clarify many basic concepts of organic chemistry such as electronic effects and steric effects. I also did the molecular docking and molecular dynamic simulation studies to analyze the molecular interactions of ligands with their targeted proteins. The molecular modeling assignment basically helped me to rationalize the results of *in vitro* assays. My futuristic research objectives include some potential ideas for the development of new bioactive molecules for various pharmacological exploration.

**Academic Credential****DOCTORATE OF PHILOSOPHY (Pursuing)****(2017-Till date)**

Department of Pharmaceutical Sciences

Guru Nanak Dev University

Amritsar, Punjab, India

**Tentative title:** Synthesis and evaluation of novel Indole N-glycosides as antidiabetic agents**CGPA in PhD Course Work:** 9.40**Supervisor:** Prof. Preet Mohinder Singh Bedi, M. Pharm., Ph.D.

Department of Pharmaceutical Sciences,  
Guru Nanak Dev University, Amritsar-143001

**Co-Supervisor:** Dr. Debaraj Mukherjee, Principal Scientist  
Natural Product Chemistry Division,  
CSIR-Indian Institute of Integrative Medicine, Jammu-180001

**MASTER OF PHARMACY (Pharmaceutical Chemistry)** (2014-2016)

Department of Pharmaceutical Sciences and Drug Research  
Punjabi University, Patiala.

**Thesis title:** Stability studies on *Gymnema sylvestre*

**CGPA obtained:** 7.79

**Supervisors:** Prof. Gulshan Bansal, M. Pharm., Ph.D.  
Department of Pharmaceutical Sciences and Drug Research  
Punjabi University, Patiala.

**BACHELOR OF PHARMACY** (2010-2014)

Lala Lajpat Rai College of Pharmacy, Moga

**Percentage:** 73.5 %

**Project work (VIII Sem):** To investigate the renoprotective effect of antioxidant in diabetic nephropathy

**SENIOR SECONDARY EXAMINATION** (March 2010)

Saint Fateh Singh Convent School, Bathinda Dasmesh Public School

**Percentage:** 70 %

**Board:** C.B.S.E

**MATRICULATION** (March 2008)

Dasmesh Public School, Faridkot

**Percentage:** 75.6 %

**Board:** C.B.S.E

### Awards & Honors

#### ➤ Fellowship Awards

1. Research Fellowship awarded by **All India Council for Technical Education** (Under **GPAT** Scheme), Government of India (July 2014 - May 2016).

2. Research Fellowship awarded by **Department of Science and Technology** (Under **DST-PURSE** Scheme), Government of India (September 2017 - March 2021).
3. Research Fellowship awarded by **Council of Scientific & Industrial Research** (under **CSIR-SRF** Scheme), Government of India (April 2021 – till date).

➤ **Other Honors**

1. **Fellow** of **CSIR-SRF**, 2021.
2. **Former fellow** of **DST PURSE** Program, 2017.
3. Bagged **1<sup>st</sup> position** in **Poster Presentation in National Conference** on “Current Trends and Futuristic Challenges in Pharmaceutical Sciences and Biotechnology” held at G.H.G Khalsa College of Pharmacy, Gurusar Sadhar in 2018.
4. **Best academic student award** in 2014 in **B. Pharm**
5. **Qualified** Graduate Pharmacy Aptitude Test (**GPAT**) in 2014.
6. Secured **2<sup>nd</sup> position** in B Pharmacy 2<sup>nd</sup> semester in Examination May - 2011 in Lala Lajpat Rai College of Pharmacy, Moga.
7. Secured **3<sup>rd</sup> position** in B Pharmacy 6<sup>th</sup> Semester in Examination May-2013 in Lala Lajpat Rai College of Pharmacy, Moga.

### Research Experience

1. **June-2015 to May-2016:** Department of Pharmaceutical Sciences and Drug Research, Punjabi University, Patiala.
2. **January 2019 to June 2019:** Natural Product Chemistry Division, CSIR-IIIM, Jammu.
3. **September 2017 to Till date:** Department of Pharmaceutical Sciences, Guru Nanak Dev University, Amritsar.

### Publications

#### Research articles

1. **Harmandeep Kaur Gulati**, Kavita Bhagat, Atamjit Singh, Nitish Kumar, Arshmeet Kaur, Akriti Sharma, Shilpa Heer, Harbinder Singh, Jatinder Vir Singh, Preet Mohinder S. Bedi. Design, synthesis and biological evaluation of novel indolinedione-coumarin hybrids as xanthine oxidase inhibitors. **Medicinal Chemistry Research**. 29: 1632-1642 (2020). ISSN: 1554-8120.

2. Jasmeen Kaur, **Harmandeep Kaur** and Gulshan Bansal. Assessment of shelf-life of *Gymnema sylvestre* extract through WHO recommended stability study involving chromatographic and biological activity analyses. **Natural Product Research** (2019) 1-6.
3. Kavita Bhagat, Jatinder Vir Singh, Aakriti Sharma, Arshmeet Kaur, Nitish Kumar, **Harmandeep Kaur Gulati**, Atamjit Singh, Harbinder Singh, Preet Mohinder Singh Bedi. Novel series of triazole containing coumarin and isatin based hybrid molecules as acetylcholinesterase inhibitors. **Journal of Molecular Structure**. (2021). ISSN: 0022-2860.
4. Nitish Kumar, Atamjit Singh, **Harmandeep Kaur Gulati**, Kavita Bhagat, Komalpreet Kaur, Jaspreet Kaur, Shilpa Dudhal, Amit Duggal, Puja Gulati, Harbinder Singh, Jatinder Vir Singh, Preet Mohinder Singh Bedi. Phytoconstituents from ten natural herbs as potent inhibitors of main protease enzyme of SARS-COV-2: In silico study. **Phytomedicine Plus**. 1: 100083 (2021). ISSN: 2667-0313.
5. Atamjit Singh, Sahil Sharma, Saroj Arora, Shivani Attri, Prabhjot Kaur, **Harmandeep Kaur Gulati**, Kavita Bhagat, Nitish Kumar, Harbinder Singh, Jatinder Vir Singh, Preet Mohinder Singh Bedi, New coumarin- benzotriazole base hybrid molecules as inhibitors of acetylcholinesterase and amyloid aggregation. **Bioorganic & Medicinal Chemistry Letters**. 30: 127477 (2020). ISSN: 0960-894X.
6. Gurinder Kaur, Jatinder V. Singh, Manish K. Gupta, Kavita Bhagat, **Harmandeep K. Gulati**, Atamjit Singh, Preet Mohinder S. Bedi, Harbinder Singh, Sahil Sharma. Thiazole-5-carboxylic acid derivatives as potent xanthine oxidase inhibitors: Design, synthesis, in vitro evaluation and molecular modelling studies. **Medicinal Chemistry Research**. 29: 83-93 (2020). ISSN: 1554-8120.
7. Kavita Bhagat, Jyoti Bhagat, Manish Kumar Gupta, Jatinder Vir Singh, **Harmandeep Kaur Gulati**, Atamjit Singh, Kamalpreet Kaur, Gurinder Kaur, Shally Sharma, Abhineet Rana, Harbinder Singh, Sahil Sharma, Preet Mohinder Singh Bedi. Design, synthesis, anti-microbial evaluation and molecular modeling studies of novel indolinedione-coumarin molecular hybrids. **ACS Omega**, 4: 8720-8730 (2019). ISSN: 2470-1343.
8. Kavita Bhagat, Atamjit Singh, Suruchi Dhiman, Jatinder Vir Singh, Gurinder Kaur, **Harmandeep Kaur Gulati**, Palwinder Singh, Raman Kumar, Rajan Salwan, Kajal Bhagat, Harbinder Singh, Preet Mohinder Singh Bedi, Sahil Sharma. Microwave assisted synthesis of 11-substituted-3,3-dimethyl-2,3,4,5,10,11- hexahydrodibenzo[b,e][1,4]diazepin-1-one derivatives

catalyzed by silica supported fluoroboric acid as potent antioxidant and anxiolytic agents. **Medicinal Chemistry Research**, 28: 2200-2217 (2019). ISSN: 1554-8120.

9. Atamjit Singh, Jatinder V. Singh, Abhineet Rana, Kavita Bhagat, **Harmandeep Kaur Gulati**, Raman kumar, Rajan Salwan, Kajal, Gurinder Kaur, Navjot Singh, Randeep Kumar, Harbinder Singh, Sahil Sharma, Preet Mohinder S. Bedi. Monocarbonyl curcumin based molecular hybrids as potent antibacterial agents. **ACS Omega**, 4: 11673-11684 (2019). ISSN: 2470-1343.

#### Review articles

1. Nitish kumar, **Harmandeep Kaur Gulati**, Aakriti sharma, Shilpa Heer, Anupmjot Kaur Jassal, Lovenish Arora, Simranpreet Kaur, Atamjit Singh, Kavita Bhagat, Arshmeet Kaur, Harbinder Singh, Jatinder Vir Singh, Preet Mohinder Singh Bedi. Most recent strategies targeting estrogen receptor alpha for the treatment of breast cancer. **Molecular Diversity**. (2020) (doi: 10.1007/s11030-020-10133-y). ISSN: 1573-501X.
2. Harbinder Singh, Jatinder Vir Singh, Kavita Bhagat, **Harmandeep Kaur Gulati**, Mohit Sanduja, Nitish Kumar, Nihar Kinarivala, Sahil Sharma. Rational Approaches, Design Strategies, Structure Activity Relationship and Mechanistic Insights for Therapeutic Coumarin Hybrids. **Bioorganic & Medicinal Chemistry**, 27: 3477-3510 (2019) ISSN: 0968-0896.

#### Communicated articles

1. **Harmandeep K Gulati**, Sushil Choudhary, Nitish Kumar, Debaraj Mukherjee, PMS Bedi. "Design, Synthesis, Biological Investigations and Molecular Interactions of Tacrine Fused Glycoconjugates as Acetylcholinesterase Inhibitors with Reduced Hepatotoxicity", **Bioorganic Chemistry**. (Under revision in **Bioorganic Chemistry**- submitted)
2. Jatinder V Singh, Shubham Thakur, Nitish Kumar, Harjeet Singh, Mithu, Venus Singh, Harpreet Singh, Kavita Bhagat, **Harmandeep Kaur Gualti**, Sahil Sharma, Preet Mohinder Singh Bedi. "Donepezil inspired multi- targeting indanone derivatives as effective anti-Alzheimer's agents". **ACS chemical Neuroscience** (under Revision)
3. Kavita Bhagat, Jatinder Vir Singh, **Harmandeep Kaur Gulati**, Nitish Kumar, Aanchal Sharma, Harbinder Singh, Preet Mohinder Singh Bedi, Dihydrofolate reductase inhibitors: Patent landscape and their phases of clinical development (2001-2021).

## Book

**Harmandeep Kaur Gulati**, Parul Grover, Debaraj Mukherjee “**Chromenes as anticancer agents**” (Under communication). Bentham Science Publisher.

### Posters & Oral Presentations

1. **Oral presentation** on Design, synthesis, biological investigations and molecular interactions of Tacrine fused glycoconjugates as acetylcholinesterase inhibitors with reduced hepatotoxicity at 3<sup>rd</sup> World Congress on Drug Discovery & Development 2021, Bengaluru, India.
2. **Certified participation** in ISFCON-2021 online International Conference on Recent Advances in Pharmaceutical Sciences: Vision 2030 at ISF college, Moga on July 1- July 3, 2021.
3. **Presented a poster** entitled “Design, synthesis, antimicrobial evaluation and molecular modeling studies of novel indolinediones-Coumarin molecular hybrids” on International Conference on Drug Discovery, held at BITS Pilani, Hyderabad in Feb 2020.
4. **Presented a poster** entitled “Benzoflavone derivatives as potent antihyperuricemic agents” at 2<sup>nd</sup> International Conference of Pharmacy (ICP-2019) on 12<sup>th</sup>-14<sup>th</sup> Sept, 2019 at Lovely Professional University, Phagwara.
5. **Poster presentation** on “Synthesis, Screening and Docking Studies of Benzochromone Derivatives as Xanthine Oxidase Inhibitors” in seminar on “Scope and Development of Entrepreneurship in Pharma and Recent Advances in Pharmaceutical Research” on 26<sup>th</sup> October, 2017 organised by Herbal Health Research Consortium Pvt. Ltd., Amritsar.
6. **Presented a poster** entitled “Exploration of potential of *Clerodendrum inerme*, *Jasminum mesnyi* Hance and *Callistemon citrinus* in Type-2 diabetes.” in 1<sup>st</sup> Indo-Korean Conference on “Current Progress and Future Prospectives in Pharmaceutical Technology” organized by APP Punjab State Branch in collaboration with G.H.G Khalsa College of Pharmacy Gurusar Sadhar, Ludhiana, Punjab on October 17, at college campus in 2015.
7. **Presented a poster** entitled “Comparative hypoglycaemic potential of *Clerodendrum inerme*, *Jasminum mesnyi* Hance and *Callistemon citrinus*.” in the 2<sup>nd</sup> Annual National Conference of “Association of Pharmaceutical Teachers of India” organized by Department of Pharmaceutical Sciences, Maharshi Dayanand University, Rohtak and APTI Haryana State Branch in 2015.
8. **Poster presentation** in one day Regional Seminar on “Importance of Intellectual Property Rights

in Pharmaceutical Sciences and Research” on January 29<sup>th</sup>, 2016 at Senate Hall, Baba Farid University of Health Sciences, Faridkot.

9. **Certified participation and poster presentation** on “Exploration of potential of *Clerodendrum inerme*, *Jasminum mesnyi* Hance and *Callistemon citrinus* in Type-2 diabetes.” in the International Seminar on “Nanotherapeutics & Crystal Engineering: Challenges and Future Prospectives” on 8 February, 2016 organized by Department of Pharmaceutical Sciences and Drug Research, Punjabi University, Patiala and Centre For Pharmaceutical Engineering Science, School of Pharmacy, University of Bradford, UK.
10. **Oral presentation** on “Long Term Stability Testing on Dried Extracts of *Centella asiatica* as per ICH guidelines.” in 2<sup>nd</sup> Annual National Convention of Association of Pharmaceutical Teachers of India (Punjab State Branch) on 18<sup>th</sup> and 19<sup>th</sup> March, 2016 organized by APTI and GPCG, Patiala.

#### Symposium/Workshop Participated

1. Virtual participation in 3 days workshop entitled “Protein Modeling for Drug Discovery and Development” organized by DBT-Bioinformatics Centre, Punjabi University, Patiala, in July, 2021
2. Government of India Sponsored AYUSH Cluster Project Seminar on “Scope and Development of Entrepreneurship in Pharma and Recent Advances in Pharmaceutical Research” held on 26-Oct-2017. Herbal Health Research Consortium Pvt. Ltd, Amritsar, Punjab, India.
3. Attended a Workshop on Analytical Techniques (CPEPA & UGC sponsored) at Guru Nanak Dev University, Amritsar on 15-17 Jan-2018.
4. Participated in workshop “Modern Analytical Techniques in Pharmaceutical Sciences-MATPS-2015” held on 3 March, 2015 at Chitkara College of Pharmacy, Chitkara University, Rajpura.

#### Research Responsibilities

- Design, synthesis and analysis of molecules for screening in drug discovery projects.
- Manage own academic research and administrative activities. This involves small scale project management to co-ordinate multiple aspects of work to meet deadlines
- Adapt existing, and develop new scientific techniques and experimental protocols
- Test hypotheses and analyze scientific data from a variety of sources, reviewing and refining working hypotheses as appropriate
- Contribute ideas for new research projects

- Develop ideas for generating research income, and present detailed research proposals to senior researchers
- Undertake comprehensive and systematic literature reviews and write up the results for publication in peer-reviewed journals
- Collaborate in the preparation of scientific reports and journal articles and occasionally present papers and posters
- Use specialist scientific equipment in a laboratory environment
- Act as a source of information and advice to other members of the group on scientific protocols and experimental techniques
- Represent the research group at external meetings/seminars, either with other members of the group or alone
- Carry out collaborative projects with colleagues in partner institutions, and research groups.
- Actively participate in group meetings and problem sessions.

#### Technical Skills

- Operated and handled instruments: HPLC (High Performance Liquid Chromatography), UV-Visible Spectrophotometer, Rotary evaporator
- Performed chromatographic techniques: HPLC, TLC, column
- Knowledge of modern analytical techniques: IR, NMR and interpretation of data
- Performed synthetic organic reactions and pharmaceutical analysis

#### Personal Details

Father's name : Late Amardeep Singh Gulati

Mother's name : Mrs. Paramjeet Kaur Gulati

Date of Birth : 14 September, 1991

Nationality : Indian

Sex : Female

Current address : Department of Pharmaceutical Sciences, Guru Nanak Dev University, Amritsar

Languages Known : English, Hindi, Punjabi

Marital status : Unmarried



## References

### 1. Dr. Debaraj Mukherjee

Principal Scientist,  
Natural Product Chemistry Division,  
CSIR-Indian Institute of Integrative Medicine,  
Jammu-180001

E-mail: [dmukherjee@iiim.res.in](mailto:dmukherjee@iiim.res.in)

### 2. Dr. Preet Mohinder Singh Bedi

Professor  
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Guru Nanak Dev University, Amritsar  
Amritsar-143005

E-mail: bedi [preet@yahoo.com](mailto:preet@yahoo.com)

### 3. Dr. Harbinder Singh

Postdoctoral Research Fellow  
Western University of Health Sciences,  
Pomona, CA-91766, USA  
E-mail: [singh.harbinder40@gmail.com](mailto:singh.harbinder40@gmail.com)

## Declaration

*I hereby declare that the above written particulars are true to the best of my knowledge and belief.*



**(Harmandeep Kaur Gulati)**