

BIODATA

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Google scholar link-

<https://scholar.google.com/citations?hl=en>

&user=KHw7fdMAAAAJ



General Details

Date of Birth: 03/09/1985

Gender: Female

Category: General

Nationality: Indian

Marital Status: Married

Children: One (Boy)

Education Details

2010-15: **PhD** (Under 2009 UGC norms)
(Pre PhD course work CGPA=9.2 out of 10)
Broad Area: Synthetic Organic & Medicinal Chemistry
Department of Chemistry
Centre for advanced studies-UGC
Guru Nanak Dev University
Amritsar

PhD Supervisor: Professor Palwinder Singh

Thesis title: Mechanism based design and synthesis of new chemical entities for optimum inhibition of cyclooxygenase-2 and dihydrofolate reductase-potential anti inflammatory and anticancer agents.

Short Summary of PhD thesis work:

Keeping in mind the two health related issues viz. inflammation and cancer and their inter relationship, the thesis work aimed at the development of effective anti-inflammatory and anti-

cancer agents. Indole, chromone and pyrazole are a part of many natural systems and are associated with wide range of biological activities including anti-cancer, anti-inflammatory, anti-microbial, etc. Due to the characteristic biological features of these moieties, it was intended to utilize them in the design and synthesis of new anti-inflammatory and anti-cancer agents. Keeping in mind the higher efficacy of hybrid molecules, it was envisaged that the compounds obtained by the combination of chromone-indole and chromonepyrazole may prove as better COX-2 inhibitors along with exhibiting poor toxicity to the host in comparison to their individual parent molecules. The stepwise synthesis of molecules was performed by the combination of two and three biologically relevant moieties in a single molecule. The anti-inflammatory activities were evaluated by using enzyme immunoassay kits (both COX-1 and COX-2) and using different spectral techniques including NMR and mass spectroscopy. Molecular docking studies were performed to rationalize the designing approach. Analgesic activities were also carried out for compounds that were found active in vitro and resulted into the development of significantly potent anti-inflammatory and analgesic agents. Another set of indole, pyrazole, barbituric acid conjugates were synthesized and evaluated for tumor growth inhibitory activities as well as for their mode of action. In vitro tumor growth inhibitory activities of compounds were investigated on 60 cell line panel of human cancer cells at National Cancer Institute (NCI), Bethesda, MD, USA. The compounds were found to be selective for different cell lines. Results of anti-cancer screening experiments clearly indicated the potency of the compounds for controlling cancer growth over certain cell lines. Mechanistic investigations for mode of action of the compounds with RNR, TS, TP and DHFR (the enzymes involved in the process of propagation of cancer) were investigated with the help of UV-visible spectral studies, enzyme immunoassay and molecular modelling. It was envisaged that the studies may help in further refinement of the compounds for increasing their drug efficacy. The comparison of tumor growth inhibitory activities and UV-visible spectral studies (in presence of DHFR) of the compounds clearly supported the combination of the chemical entities for appreciable anticancer activities and interactions with DHFR. Overall, during the work on hybrid molecules in the last four years, we came out with certain molecules which could act as promising leads for their development to anti-inflammatory and anti-cancer drugs. Moreover, we were able to define the cellular target and hence the mode of action of the compounds.

2007-09:	M.Sc. (Silver Medalist & University 2nd rank holder) Applied Chemistry (Pharmaceuticals) Department of Applied Chemistry Guru Nanak Dev University Amritsar, Punjab	Marks obtained: 1856/2500 (Percentage: 74.2%)
2004-07:	B.Sc. Medical DM College Moga Affiliated to Panjab University Chandigarh	Marks obtained: 1516/2000 (Percentage: 75.8%)

2002-04: **10+2 (PSEB)**
DM College
Moga
Affiliated to Panjab University
Chandigarh
Marks obtained: 338/450
(Percentage: 75.1%)

2002: **10th (CBSE)**
Dr S K Memorial Public School
Moga
Punjab
Marks obtained: 392/500
(Percentage: 78.4%)

Post PhD Teaching Experience and Post Held

May 2022-till date: **Assistant Professor**
Department of Chemistry
Baba Farid College, Bathinda

July 2018-April 2019: **Assistant Professor**
Post Graduate Department of Chemistry
Akal University
Talwandi Sabo

July 2017-April 2018: **Assistant Professor**
Post Graduate Department of Chemistry
DAV College
Bathinda

July 2015-April 2016: **Assistant Professor**
Post Graduate Department of Chemistry
Khalsa College
Amritsar

Industrial Experience

August 2009-February 2010: Trainee Research Associate
Department of Organic Synthesis
Research & Development Centre
Jubilant Chemsys Ltd.
Noida
Uttar Pradesh
(Six Months)

During PhD Teaching Experience and Post Held

July- November 2011: **Research Fellow**
Department of Chemistry
Centre for advanced studies-UGC

Awards & Fellowships

- UGC-BSR JRF & SRF: 2012-15
 - University Fellowship: 2010-12
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Teaching Interests

- Stereochemistry Concepts
 - Pericyclic Reactions
 - Organic Reaction Mechanisms
 - Aromaticity of Organic Compounds
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Research Interests

- Synthesis of bioactive small organic molecules
 - Molecular modelling
 - Molecular Hybridization
 - Spectroscopic characterization of the synthesized molecules
 - Anti-inflammatory bio-evaluation of the synthesized compounds
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Key Skills

- Experience in handling air sensitive reagents and corresponding reactions.
 - Experience in handling the spectroscopic instruments such as NMR, IR, UV-vis. and HRMS spectrometers.
 - Experience in writing research papers/review articles/ projects and designing synthetic schemes.
 - Supervision of research students.
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List of Publications

1. Advances in the synthesis and anticancer activities of pyrimidine based scaffolds, Kewal Kumar, Vipin Kumar Swati, **Shaveta**, Shalini, Seema Sharma, Rajesh Kumar, *Eur. J. Med. Chem.*, **2026**, **302**, 118319.
2. Exploring the bioactive components of *Stevia* essential oil and their versatile applications in the food, cosmetic, and agricultural domains, Heena, Pooja Sharma, **Shaveta**, Dharmender Sharma, Ritu Pawan, Denise Fernandes Coutinho, Randolph Arroo, Sonia Malik, *Chem. Biodivers.*, **2025**.
3. Unveiling the versatile biological properties of chromone: A comprehensive exploration, **Shaveta**, *NCMRI-2024*, Baba Farid College, Bathinda, **2024**, ISBN: 9789334027785, 65-72.
4. Rational Design and Synthesis of Isatin-Chalcone Hybrids Integrated with 1H-1,2,3-Triazole: Anti-Proliferative Profiling and Molecular Docking Insights. Swati, Asif Raza, Shefali Chowdhary, Amit Anand, **Shaveta**, Arun Sharma, Kewal Kumar, Vipin Kumar, *Chem Med Chem*, **2024**, 19, e202400015.
5. Hybrid molecules: The privileged scaffolds for various pharmaceuticals, **Shaveta**, Sahil

- Mishra, Palwinder Singh, *Eur. J. Med. Chem.*, **2016**, *126*, 500.
- Insights into inhibition of human amyloid beta protein precursor (APP: PDB ID 3UMI) by (E)-N-(pyridin-2-ylmethylene) arylamine (LR) models: Structure elucidation of a family of ZnX₂-LR complexes, Tushar Shubhra Basu Baul, Sajal Kundu, Palwinder Singh, **Shaveta** and Fátima Guedes da Silva, *Dalton Trans.*, **2015**, *44*, 2359.
 - Arachidonic acid metabolic pathway: Appraisal of differential availability of arachidonic acid and anti-inflammatory drugs to COX-1, COX-2 and 5-LOX enzymes, **Shaveta**, Amrinder Singh, Jagroop Kaur, Palwinder Singh, *Inflammation and Cell Signaling*, **2014**, *01*, e176.
 - Microwave assisted degradation of lignin to monolignols, **Shaveta**, Harshpinder Kaur, Palwinder Singh, *Pharmaceutica Analytica Acta*, **2014**, *5*, 308.
 - Rational design, synthesis and evaluation of chromone-indole and chromone-pyrazole based conjugates: Identification of a lead for anti-inflammatory drug, **Shaveta**, Amrinder Singh, Matinder Kaur, Surbhi Sharma, Rajbir Bhatti, Palwinder Singh, *Eur. J. Med. Chem.*, **2014**, *77*, 185.
 - F/Cl⁻ mediated microwave assisted breakdown of cellulose to glucose, **Shaveta**, Neha Bansal, Palwinder Singh, *Tet. Lett.*, **2014**, *55*, 2467.
 - Structural optimization of indole based compounds for highly promising anti-cancer activities: Structure activity relationship studies and identification of lead molecules, **Shaveta**, Palwinder Singh, *Eur. J. Med. Chem.*, **2014**, *74*, 440.
 - Rationally designed hybrid molecules with appreciable COX-2 inhibitory and anti-nociceptive activities, Palwinder Singh, **Shaveta**, Surbhi Sharma, Rajbir Bhatti, *Bioorg. & Med. Chem. Lett.*, **2014**, *24*, 77.
 - Mechanism inspired development of rationally designed Dihydrofolate Reductase inhibitors as anticancer agents, Palwinder Singh, Matinder Kaur, **Shaveta**, *J. Med. Chem.*, **2012**, *55*, 6381.
 - Antiplasmodial and cytotoxicity evaluation of 3-functionalized 2-azetidinone derivatives, Pardeep Singh, **Shaveta**, Raghu Raj, Vipin Kumar, *Bioorg. & Med. Chem. Lett.*, **2011**, *21*, 4561.

International Books

- Title:-Molecular Hybridisation: A revolution in contemporary drug development.
Authors: Palwinder Singh and **Shaveta**
Publisher: Lambert Academic Publishing is a trademark of: OmniScriptum GmbH & Co. KG, Germany, ISBN No: 3330080191
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Participation/Poster Presentations in Conferences

- 2nd Annual National Conference SPARK (Student platform for Advanced Research and Knowledge Sharing), **2025**, Baba Farid College, Bathinda.
- National Conference on Multidisciplinary Research and Innovation-2024, **2024**, Baba Farid College, Bathinda.
- IVth National Symposium on Advances in Chemical Sciences to Commemorate the National

- Science Day, **2014**, Department of Chemistry, Guru Nanak Dev University, Amritsar
4. 16th National Symposium in Chemistry, **2014**, Department of Chemistry, Indian Institute of Bombay
 5. National Symposium on Recent Trends in Chemistry, Organized under UGC-CAS, **2013**, Guru Nanak Dev University, Amritsar
 6. Workshop on usage of various scientific instruments, **2012**, Department of Chemistry, Guru Nanak Dev University, Amritsar
 7. 8th J-NOST conference, **2012**, I Department of Chemistry, Indian Institute of Guwahati
 8. Bruker pre-NMRS Symposium, **2011**, Department of Chemistry, Guru Nanak Dev University, Amritsar
 9. National Symposium on Chemistry in 21th Century, **2011**, Department of Chemistry, Guru Nanak Dev University, Amritsar.
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