

Dr. Vikas Jaitak

Assistant Professor
Centre for Pharmaceutical Sciences and Natural Products
School of Basic and Applied Sciences
Central University of Punjab
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Education

Course	Name of Institution	Year	Subject
Ph.D.	CSIR-Institute of Himalayan Bioresource Technology, Palampur (HP), India	2011	Natural Product and Synthetic Chemistry
B. Ed	Himachal Pradesh University, Shimla (HP), India	2004	
M.Sc. -	Guru Nanak Dev University, Amritsar (Pb), India	2003	Chemistry
B.Sc. (N.M.)	Himachal Pradesh University, Shimla (HP), India	2001	

Experience

1. Project Assistant at CSIR-Institute of Himalayan Bioresource Technology, Palampur (HP), India from February 2005-February 2007.
2. Project Assistant-II at CSIR-Institute of Himalayan Bioresource Technology, Palampur (HP), India from March 2007- March 2008
3. Senior Research Fellow at CSIR-Institute of Himalayan Bioresource Technology, Palampur (HP), India from April 2008- March 2011
4. Assistant Professor at Central University of Punjab, Bathinda (Pb.), India from July 2011-till date.

Teaching Assignments

1. Organic Chemistry-I &II
2. Logics of Organic Chemistry-I &II
3. Spectral Analysis and Chromatographic Techniques
4. Green Chemistry
5. Basics of Drug Action and Discovery
6. Medicinal Chemistry of Anticancer Agents
7. Chemistry of Natural Products
8. Physical Medicinal Chemistry

9. Medicinal Chemistry-I
10. Inorganic Medicinal Chemistry

Research Projects:

Ongoing

1. Project:- Synthesis of Rebaudioside-A: Natural Substitute for sugar from *Stevia rebaudiana* (Bertoni)

DST Fast track Project- 25.5 lacs,

Project Investigator: Dr. Vikas Jaitak

2. Project:- Chemical investigation, Antidiabetic and Anticancer study of *Stevia rebaudiana* (Bertoni) through in-vitro and in-silico approach

UGC Start- up – Grant – 6 lacs

Project Investigator: Dr. Vikas Jaitak

3. Project:- Studies on Phytoestrogens as anticancer agents from *Asparagus racemosus* (Shatavari) used in Breast cancer chemotherapy

Research Seed Money, Central University of Punjab, Bathinda (Pb.), India- 3.0 lacs

Project Investigator: Dr. Vikas Jaitak

4. Project:- Phylogenetic Selection of Target Taxa for Anti-Proliferative and Anti-Metastatic Marine Natural Products from Seaweeds of Indian Coast (Recommended)

Ministry of Earth Sciences (MoES), Government of India- 91.2 lacs

Co-Project Investigator: Dr. Vikas Jaitak

Submitted

Two more projects have been submitted.

Professional Recognition /Awards/Scholarship :

- 2003- Qualified LS CSIR-NET in Chemical Sciences
- 2005- Qualified LS CSIR-NET in Chemical Sciences
- 2007- Qualified JRF CSIR-NET in Chemical Sciences
- 2008- CSIR-Senior Research Fellowship (Direct)

Peer Recognition :

Journals Reviewer

- *Natural Product Research*
- *Annals of Microbiology*
- *Medicinal Chemistry Research*
- *Journal of Agricultural and Food Chemistry*
- *African Journal of Pharmacy and Pharmacology*
- *Pharmaceutical Biology*
- *Phytotherapy Research*
- *RSC Advances*

- *European Journal of Medicinal Chemistry*
- *Mini-Review in Medicinal chemistry*
- *International Journal of Food Sciences and Technology*

Editor/Associate Editor

- *International Journal of Analytical Chemistry Research*
- *International Journal of Chemical Research*
- *Journal of Medicinal Chemistry Letters*
- *Evidence-Based Complementary and Alternative Medicine*
- *Journal of Evolving Stem Cell Research*

Membership of Professional Bodies

- Lifetime membership of Indian Scientific Analytical Scientists Delhi, India

Area specializations/Research Interests

- Chemical investigation of bioactive compounds from natural resources for the development of drug molecules
- Development of new analytical procedures for determination of bioactive compounds and their quality control
- Design, synthesis and Biological evaluation of anticancer and antidiabetic molecules
- Nano-encapsulation of anticancer and anti-diabetic molecules from plants for better drug delivery Synthetic methodologies development & catalysis specifically focus on solid-supported catalysis Drug design and synthesis of bioactive molecules specifically focus on anti-diabetic and anticancer
- Characterizing and synthesis of high grade perfumery molecules
- Biocatalysis
- *In-silico* studies of natural products

Publications

Research Papers

- **Vikas Jaitak**, A.P.Gupta, V.K.Kauland P.S Ahuja. Validated high-performance thin-layer chromatography method for steviol glycosides in *Stevia rebaudiana*. *Journal of Pharmaceutical and Biomedical Analysis* **47**: 790-794,2008.
- **Vikas Jaitak**, Bikram Singh and V.K.Kaul. Variability of volatile constituents in *Artemisia maritima* western Himalaya. *Natural Product Research* **22**: 565-568, 2008.
- **Vikas Jaitak**, Bandna, Bikram Singh and V.K.Kaul. An efficient microwave-assisted extraction process of stevioside and rebaudioside-A from *Stevia rebaudiana*. *Phytochemical Analysis* **20**: 240-245, 2009.
- **Vikas Jaitak**, Vijay Kumar Kaul, Bandna, Neeraj Kumar, Bikram Singh, Laxman. S. Savergave, V.V.Jogdand, and Sanjay Nene. Simple and efficient enzymatic

transglycosylation of stevioside by β -Cyclodextrin glucanotransferase from *Bacillus firmus*. *Biotechnology Letters* **31**: 1415-1420, 2009.

- Bandna, **Vikas Jaitak**, Bikram Singh and V.K.Kaul. Synthesis of novel acetates of Caryophyllene under lewis acid conditions. *Natural Product Research* **23**: 1445-1450, 2009.
- **Vikas Jaitak**, Kapil Sharma, Kalpana Kalia, Neeraj Kumar, H.P.Singh, Bikram Singh and V.K.Kaul. Antioxidant activity of *Potentilla fulgens*: An alpine plant of western Himalaya. *Journal of Food Composition and Analysis* **23**:142-147, 2010.
- Nitin P. Kurade, **Vikas Jaitak**, V.K.Kaul and O.P.Sharma. Chemical composition and antibacterial activity of essential oil of *Lantana camara*, *Ageratum houstonianum* and *Eupatorium adenophorum*. *Pharmaceutical Biology* **48**: 539-544, 2010.
- **Vikas Jaitak**, V.K.Kaul, Himlata, Neeraj Kumar, Bikram Singh, Jyoti Dhar, and O.P.Sharma . New Hopane Triterpenes and antioxidant constituents from *Potentilla fulgens*. *Natural Product Communication* **5**:1561-1566, 2010.
- **Vikas Jaitak**, Bandna, Pralay Das, V.K.Kaul, Bikram Singh and Neeraj Kumar. One pot multicomponent Michael-Thorpe Ziegler reaction of aryl methyl ketone. *Synthetic Communication*. **41**, 2727-2737, 2011.
- Shailja Guleria, Rikki Saini, **Vikas Jaitak**, V.K.Kaul, Brij Lal, Praveen Rahi, Arvind Gulati and Bikram Singh. Volatile oil composition and antimicrobial activity of the essential oil of *Heracleum thomsonii* (Clarke) from cold desert western Himalaya. *Natural Product Research* **25**: 1250-1260,2011.
- Shailja Guleria, **Vikas Jaitak**, Rikki Saini, Vijay K. Kaul, Brij Lal, G. D. Kiran Babu, Bikram Singh and R.D.Singh. Comparative studies of volatile oil composition of *Rhododendron anthopogon* by hydrodistillation, supercritical carbon dioxide extraction and head space analysis. *Natural Product Research* **25**, 1271-1277, 2011.
- Rikki Saini, **Vikas Jaitak**, Shailja Guleria, V.K.Kaul, G.D.Kiran Babu, Bikram Singh, Brij Lal and R.D.Singh. Comparison of headspace analysis of hydrodistilled and supercritical fluid extracted oil of *Capillipedium parviflorum*. *Journal of Essential Oil Research* **24**: 315-320, 2012.
- **Vikas Jaitak**, V.K.Kaul and Pralay Das. Enviornmentally benign Michael and Claisen Schmidt reaction of aryl carbonyl compounds by alkali exchange resin. *Indian Journal of Chemistry B* **52B**, 1137-1145, 2013.
- Ramit Singla, Rajbir Kaur, Saroj Arora, **Vikas Jaitak***. In-vitro anti-mutagenic activity of *Asparagus racemosus*- An Ayurvedic medicinal plant. *American Journal of Drug discovery and Development***3** (4), 286-292, 2013.
- Fabio Firenzuoli, **Vikas Jaitak**, Gyorgyi Horvath, Imaël Henri Nestor Bassolé, William N. Setzer, Luigi Gori. Essential Oils: New Perspectives in Human Health and Wellness. *Evidence-Based Complementary and Alternative Medicine* **2014**, 1-2, 2014.
- Iris Stappen, Jürgen Wanner, Nurhayat Tabanca, David E. Wedge, Abbas Ali, Ikhlas A. Khan, Vijay K. Kaul, Brij Lal, **Vikas Jaitak**, Velizar Gochev, Tania Girova, Albena Stoyanova, Erich Schmidt, Leopold Jirovetz. Chemical composition and biological effects of Artemisia essential oils from Western Himalaya. *Planta Medica*, **2014**, 80, 1079-1087.

- Prakriti Monga, Rajbir Kaur, **Vikas Jaitak***. In-vitro antimutagenic potential of *Potentilla fulgens*: A Western Himalayan Plant. *Journal of Natural Remedies* **2014**, 14 (2), 26-34.
- Ramit Singla, **Vikas Jaitak***. Molecular Docking Simulation Study of Phytoestrogens from *Asparagus racemosus* in Breast Cancer Progression. *International Journal of Pharmaceutical Sciences and Research*, **2015**, 6(1), 1000-1011.
- Iris Stappen, Jürgen Wanner, Nurhayat Tabanca, David E. Wedge, Abbas Ali, Vijay K. Kaul, Brij Lal, **Vikas Jaitak**, Velizar K. Gochev, Erich Schmidt, Leopold Jirovetz. Chemical Composition and Biological Activity of Essential Oils of *Dracocephalum heterophyllum* Benth. and *Hyssopus officinalis* L. collected wild from Western Himalaya. *Natural Product Communications* 10 (1), 133-138, 2015.
- Mayank, **Vikas Jaitak***. Interaction Model of Steviol glycosides from *Stevia rebaudiana* (Bertoni) with Sweet Taste Receptors: A Computational Approach. *Phytochemistry* 116, 12-20, 2015.
- Stappen I, Tabanca N, Ali A, Wedge DE, Wanner J, Kaul VK, Lal B, Jaitak V, Gochev VK, Schmidt E, Jirovetz L. Chemical Composition and Biological Activity of Essential Oils from Wild Growing Aromatic Plant Species of *Skimmia laureola* and *Juniperus macropoda* from Western Himalaya. *Natural Product Communications* 10(6), 1071-1074, 2015.
- Iris Stappen, Abbas Ali, Nurhayat Tabanca, Ikhlas A. Khan, Jürgen Wanner, Velizar K. Gochev, Virendra Singh, Brij Lal, **Vikas Jaitak**, Vijay K. Kaul, Erich Schmidt and Leopold Jirovetz. Antimicrobial and Repellent Activity of the Essential Oils of Two Lamiaceae Cultivated in Western Himalaya. *Current Bioactive Compounds*, 11, 23-30, 2015.
- Mayank, **Vikas Jaitak***. Molecular Docking Study of Natural Alkaloids as Multi-targeted Hedgehog Pathway Inhibitors in Cancer Stem Cell Therapy. *Computational Biology and Chemistry* (Press).
- Vinay Kumar Gupta, Rajbir Kaur, Ramit Singla, **Vikas Jaitak***. Photoprotective, antioxidant screening and new ester from dry root extracts of *Potentilla atrosanguinea* (Himalayan cinquefoil). *South African Journal of Botany*, 103, 49–53, 2016.
- Ramit Singla, **Vikas Jaitak**. Synthesis of Rebaudioside A from Stevioside and their Interaction Model with hTAS2R4 Bitter Taste Receptor. *Phytochemistry*, 125, 106-111, 2016.

* Stands for Corresponding author

Book Chapters

- **Vikas Jaitak**, Kiran Kaul, V.K.Kaul, Virendera Singh and Bikram Singh. *Stevia rebaudiana*- a natural substitute for sugar. Genetic Resources, Chromosome Engineering, and Crop Improvement: Medicinal Plants, Ed. Ram J. Singh: University of Illinois, Urbana, USA; Chapter 26, Vol 6, CRC Press USA; 1-1056, 2011.

Review Articles

- Kiran Kaul, **Vikas Jaitak** and V.K.Kaul. Review on pharmaceutical properties and conservation measures of *Potentilla fulgens* Wall. Ex Hook.- A medicinal endangered herb of higher Himalaya. *Indian Journal of Natural Products and Resources* 2, 298-306, 2011.
- Yashika Bhalla, Vinay Kumar Gupta, Vikas Jaitak*. Anticancer activity of essential oils: A review. *Journal of the Science of Food and Agriculture* 93, 3643-3653, 2013.
- Vinay Kumar Gupta, Yashika Bhalla, **Vikas Jaitak***. Impact of ABC transporters, glutathione conjugates in MDR and their modulation by flavonoids: an overview. *Medicinal Chemistry Research* 23, 1-15, 2014.
- Mayank Bashyal Insan, **Vikas Jaitak***. New approaches to target Cancer Stem Cells: Current scenario. Mini-review in *Medicinal Chemistry* 14, 20-34, 2014.
- Ramit Singla, **Vikas Jaitak***. Shatavari (*Asparagus racemosus* Wild): A review on its Ethnobotany, Phytochemistry and Pharmacological importance. *International Journal of Pharmaceutical Sciences and Research* 5 (3), 742-757, 2014.
- Mayank, **Vikas Jaitak***. Drug Targeting Strategies in Breast Cancer Treatment: Recent Updates. *Anticancer Agents in Medicinal Chemistry* 4 (10), 1414-1427, 2014.
- Anuradha Thakur, Ramit Singla, **Vikas Jaitak***. Coumarins as anticancer agents: A review on synthetic strategies, mechanism of action and SAR studies. *European Journal of Medicinal Chemistry*, 101, 476-495, 2015.
- Jagpreet Singh Sidhu, Ramit Singla, Mayank, **Vikas Jaitak***. Indole Derivatives as Anticancer Agents for Breast Cancer Therapy: A Review. *Anticancer Agents in Medicinal Chemistry*, 16 (2), 160-73, 2015.

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Communication

Communicated-6

Conferences/Symposiums

1. **Vikas Jaitak**. Society of Biopesticide Sciences, IPRC, Jalandhar, India, Nov 11-13, 2005.
2. **Vikas Jaitak**, V.K. Kaul, Bikram Singh “Enzymatic biotransformation for upgradation of stevioside (Poster # P-5) Bio, Nano, Geo Sciences, addressing issues of concern to mankind. Sponsored by Humboldt Academy Chandigarh and Kanpur and held at IHBT Palampur (HP) March 24-26 (2006)
3. **Vikas Jaitak**, Bandna, Bikram Singh, V.K.Kaul “An efficient microwave Assisted extraction of stevioside and rebaudioside-A from *S.renaudiana*. Poster presentation organised by ISAS, IHBT, Palampur ,November 23-25 (2008)
4. V.K.Kaul, **Vikas Jaitak**, G.D.Kiran Babu, K.Kaul, B. Singh & P.S.Ahuja. *Stevia rebaudiana* –Current status & future prospects. International symposium on current status and oppurtunities in aromatic and medicinal plants. CIMAP, Lucknow, Feb 21-24, 2010.

5. V.K.Kaul, **Vikas Jaitak**, G.D. Kiran Babu. *Stevia rebaudiana*-A wonder plant for diabetes. Symposium on natural products in health & disease. Biochemical and Molecular mechanisms. PU Chandigarh, March 5-6, 2010.
6. **Vikas Jaitak**, V.K.Kaul, GD Kiran Babu, Bikram Singh & PS Ahuja. Symposium on prospects of stevia. Institute of Himalyan Bioresource Technology (CSIR), Palampur (HP), Sept 24-25, 2010.
7. **Vikas Jaitak**, Kiran Kaul, V.K.Kaul, GD Kiran Babu, Bikram Singh & PS Ahuja. *Stevia rebaudiana*-A natural sweetener for diabetes. International conference on new developments in drug discovery from natural products and traditional medicines. NIPER, Mohali, 20-24 Nov. 2010.
8. **Vikas Jaitak**. International conference on “NMR at the interface of Physics Chemistry and Biology” IISER Mohali, 29-30 Nov. 2010.
9. **Vikas Jaitak**. National seminar on Environment and Health. Central University of Punjab Bathinda, 27th Sept 2011.
10. Mayank, Akanksha Sharma, **Vikas Jaitak**. Multi-targeted Breast Cancer chemotherapy- Answer to Existing problems. 50th Annual Convension of chemists, Golden Jubilee Celebrations of Indian Chemical Society, at Panjab University Chandigarh, December 04-07, 2013.
11. **Invited Lecture: Vikas Jaitak**, *Stevia rebaudiana*: Natural substitute for sugar. 4th Biennial International Conference on Drug Discovery from Natural Products and Traditional Medicines (DDNPTM-2014), 20 - 22 November 2014, NIPER Mohali
12. Anuradha Thakur, **Vikas Jaitak**, Coumarins: An emerging invaluable agent with potential anticancer property. One day symposium on Recent Trends in Molecular Medicine, Dec 5, 2014, Central University of Punjab, Bathinda
13. Ramit Singla, **Vikas Jaitak**, *Asparagus racemosus* Wild: An Emerging Plant of Enormous Medicinal and Phytochemical Importance. One day symposium on Recent Trends in Molecular Medicine, Dec 5, 2014, Central University of Punjab, Bathinda.
14. Ramit Singla, **Vikas Jaitak**, Phytoestrogens from *Asparagus racemosus* targeting breast cancer pathway components. ISBOC-10 an IUPAC's International Symposium on Bio-Organic Chemistry was been held at Indian Institute of Science Education and Research, Pune, India, January 11-15, 2015.
15. Participated to organize three days' workshop on “Drug Design, Molecular Docking, Virtual Screening and Pharmacoinformatics” at Central University of Punjab, Nov 26-28, 2015.
16. Ramit Singla, Jagpreet Singh Sidhu, **Vikas Jaitak**, Design, Synthesis and *In-vitro* Evaluation of Indole Derivatives as Putative Agents in Breast Cancer Therapy. 6th International Symposium on “Current trends in drug discovery & research”, Lucknow, India, February 25th-28th, 2016.

Research Guidance

Ph.D. supervision

Pursuing

Ramit Singla (JRF)

M.Pharm. thesis supervised

Completed

1. Title: “ *In-Vitro Bio-Assay Guided Fractionation of Crude Root Extracts of Potentilla atrosanguinea Lodd. and In-Silico Study of Polyphenolic Compounds with MDR receptors in Cancer Chemotherapy*” Mr. Vinay Kumar Gupta (Central University of Punjab Regn No: CUPB/M.PHARM-MC/SBAS/CPS/2011-12/07).
2. Title: “*Integrated in-vitro antioxidant and in-silico anti-apoptotic study of Aconitum heterophyllum Wall* - Ms. Yashika Bhalla (Central University of Punjab Regn No: CUPB/M.PHARM-MC/SBAS/CPS/2011-12/09).
3. Title: “*Phytochemical Investigation and Biological evaluation of secondary metabolites from Asparagus racemosus through in-vitro and in-silico approach*”- Ramit Singla (Central University of Punjab Regn No: CUPB/M.PHARM-MC/SBAS/CPS/2011-12/03).
4. Title: “*Phytochemical investigation, in vitro anti-mutagenic activity of Potentilla fulgens Lodd. and in-silico study of flavonoids with CDK-2, CDK-6 receptors*” - Miss Prakriti Monga (Central University of Punjab Regn No: CUPB/M.PHARM-MC/SBAS/CPS/2011-12/08).
5. Title: “*Phytochemical investigation of natural sweetener from Stevia rebaudiana* - Mr. Mayank (Central University of Punjab Regn No: CUPB/M.PHARM-MC/SBAS/CPS/2012-13/03).
6. Title: “*Anticancer activity of Cassia fistula linn. through Invitro and insilico approach*- Miss Akanksha Sharma (Central University of Punjab Regn No: CUPB/M.PHARM-MC/SBAS/CPS/2012-13/09).
7. Title: “*Design and Synthesis of Indole derivatives as Putative Anti-proliferative Agents* - Mr. Jagpreet Singh (Central University of Punjab Regn No: CUPB/M.PHARM-MC/SBAS/CPS/2013-14/03).
8. Title: “*Invitro and Insilico Study of Phytoestrogens from Asparagus racemosus in breast cancer therapy* - Miss Shivani Sharma (Central University of Punjab Regn No: CUPB/M.PHARM-MC/SBAS/CPS/2013-14/04).
9. Title: “*Design and Synthesis of Coumarin Derivatives as Putative Anti-proliferative Agents*” - Miss Anuradha Thakur (Central University of Punjab Regn No: CUPB/M.PHARM-MC/SBAS/CPS/2013-14/09).

M.Sc. thesis supervised

1. Title: “*Chemical composition and anti-bacterial evaluation of essential oils from Azadirachta indica*”– Miss Rajinder Pal Mittal (Central University of Punjab Regn No: CUPB/MSC/SBAS/CPS/2013-14/02).
2. Title: “*In silico study of flavonoids for anti-breast cancer potential*”– Miss Khushboo (Central University of Punjab Regn No: CUPB/MSC/SBAS/CPS/2013-14/04).
3. Title: “*Molecular modelling study of flavonoids for their anti-diabetic properties*”– Miss Jasmin (Central University of Punjab Regn No: CUPB/MSC/SBAS/CPS/2013-14/08).

Research Collaboration

- Dr. Iris Stappen, Department of Pharmaceutical Chemistry, University of Vienna, Vienna, Austria
- Dr. Leopold Jirovetz, Department of Pharmaceutical Chemistry, University of Vienna, Vienna, Austria
- Dr. Jürgen Wanner, Kurt Kitzing Co., Wallerstein, Germany
- Dr. Nurhayat Tabanca, National Center for Natural Products Research, University of Mississippi, University, MS, USA
- Dr. David E. Wedge, US Department of Agriculture, Agricultural Research Service, Natural Products Utilization Research Unit, University of Mississippi, University, MS, USA
- Dr. Ikhlas A. Khan, Department of Pharmacognosy, School of Pharmacy, University of Mississippi, University, MS, USA
- Dr. V.K.Kaul, Natural Plant Products Division, IHBT, Palampur (H.P.), India
- Dr. Rajbir Kaur, Department of Botanical and Environmental Sciences, GNDU, Amritsar (Pb.), India
- Dr. Tirath Raj, JAYPEE University, Kandaghat (H.P.), India
- Dr. Sandeep Singh, Central University of Punjab, Bathinda
- Dr. Felix Bast, Central University of Punjab, Bathinda

Research Award

Got research award (2014-15) from Honourable Chancellor of Central University of Punjab, Bathinda on dated 28th Feb, 2016.



Research award

Extra Curriculum activities

Gold medal in Badminton (doubles) in Sports meets during foundation celebrations from Feb 15-28, 2016.



Gold medal in Badminton doubles