

Ram Vishwakarma

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PROFESSIONAL EXPERIENCE

- Director, Indian Institute of Integrative Medicine (CSIR), Jammu (March 2009 onwards).
- Vice-President and Head (Medicinal Chemistry) Piramal Life Sciences (Nicholas Piramal Research Centre), Mumbai (2005-2009): Responsible for new drug discovery projects in the areas of inflammation, cancer, diabetes and drug-resistant infections.
- Staff-Scientist-VI at National Institute of Immunology, New Delhi, India (2005-2005).
- Staff-Scientist-V at National Institute of Immunology, New Delhi, India (2001-2005).
- Staff-Scientist-IV at National Institute of Immunology, New Delhi, India (1994-2000).
- Research Associate at Cambridge University (Dept. of Chemistry) England (1991-1993).
- Scientist at Central Institute of Medicinal & Aromatic Plants Lucknow, India (1986-1990).
- Scientist at Defense R&D organization (Govt. of India), New Delhi, India (1985-1985).
- Research Fellow (CSIR) at Central Drug Research Institute, Lucknow, India (1981-1985).

EDUCATION

- Post-doctoral studies at the Cambridge University, England (with Sir Alan Battersby FRS on biosynthesis of Vitamin B₁₂ and related corrins and porphyrins) (1991-1993).
- Ph.D. (Medicinal Chemistry) from Central Drug Research Institute Lucknow. (Thesis Title: Structure, synthesis and medicinal chemistry of polyketide) (1981-1987).

- M.Sc. (Organic Chemistry) from Bundelkhand University, India (1978-1980).

RESEARCH EXPERTISE AND INTERESTS

- 28 years of research experience (both in scientific institution and pharma company) in drug discovery, medicinal chemistry, natural-products chemistry, organic-synthesis, chemical-biology and glycobiology.
- Chemical biology of Glycosylphosphatidylinositol (GPI) anchors in parasitic protozoa.
- Molecular target based drug discovery for cancer, diabetes, inflammation and infections.
- Research and leadership experience in both academic as well as industrial setting.
- Specific interest in the questions related to the chemistry of small molecules in biology.

RECOGNITIONS AND PROFESSIONAL ASSOCIATIONS

- Ranbaxy Research Award (2014) for Pharmaceutical Sciences.
- Fellow of the National Academy of Sciences of India.
- Adjunct Professor, Institute of Life Sciences, Hyderabad (2009 onwards).
- Bronze Medal of the Chemical Research Society of India, Bangalore (2005).
- Member of the Editorial Board of the *Journal of Chemical Sciences* (published by the Indian Academy of Sciences, Bangalore (2008 onwards)).
- Member of Expert Committee on Drugs & Pharmaceuticals Research Program of the Department of Science and Technology (Govt. of India) (2009 onwards).
- Member of Genetic Engineering Approval Committee (GEAC) of the Ministry of Environment and Forests (Govt. of India) (2009 onwards).
- Member of the High Power Committee of NMITLI program of CSIR (2009 onwards).
- Member Program Advisory Committee (Organic-Chemistry) of the Department of Science and Technology (Govt. of India) (2004 onwards)
- Member of Task Force (Plant Biotechnology) of the Department of Biotechnology (Govt. of India) (2008-onwards).
- Member of Research Council of Institute of Genomics and Integrative Biology, Delhi.
- Member of Research Council of Central Inst. Medicinal & Aromatic Plants, Lucknow.

- Member of Research Council of Indian Institute of Chemical Biology, Calcutta.
- Member of Program Advisory Committee (Bio-prospecting & Molecular-Taxonomy) of the Department of Biotechnology (Govt. of India) (2003-2005).
- Member of Expert Committee of the CSIR on the trans-disciplinary research (2005-2008).
- Invited lecture at the Gordon Research Conference (Glycobiology) in USA (2005).
- 45 Invited lectures at the various International and National scientific conferences.
- Referee for various journals published by ACS, RSC and Elsevier.
- Grant-reviewer for American (NSF), British (Wellcome-Trust) and Indian (DBT, DST and CSIR) national funding agencies.
- Received continuous research grants from various Indian (DST, DBT and CSIR) and the US (NIH) funding agencies.
- Member of the ACS (USA) and RSC (UK).
- BOYSCAST-Fellowship of DST (Govt. of India) for the Chemical Sciences (1991).
- A number of Ph.D. students supervised both in chemistry and biology (recognized as Ph.D. guide of the Jawaharlal Nehru University, JNU, New Delhi).

VISITING ASSIGNMENTS

- Visiting Scientist (1991) at Cambridge University, England.
- Visiting Scientist (1996) at the Institute Armand-Frappier, University of Quebec, Canada.
- Visiting Scientist (2000-2001) at Virginia Tech University Blacksburg USA.

RESEARCH PUBLICATIONS (In chronological order, 2015 downwards)

- Manda, S.; Sharma, S.; Wani, A.; Joshi, P.; Kumar, V.; Guru, S.K.; Bharate, S.S.; Bhushan, S.; Vishwakarma, R.A.; Kumar, A. and Bharate, S.B. Discovery of a marine-derived bis-indole alkaloid fascaplysin, as a new class of potent P-glycoprotein inducer and establishment of its structure-activity relationship. **European Journal of Medicinal Chemistry**, 2015,107, 1–11.
- Sharma, R; Vishwakarma, R.A.; Bharate, S.B. An efficient transformation of furano-hydroxychalcones to furanoflavones via base mediated intramolecular tandem O-arylation and

C-O bond cleavage: A new approach for synthesis of furanoflavones. **Organic & Biomolecular Chemistry**, 2015, 13, 10461-10465.

- Yadav, R.R.; Sharma, S.; Joshi, P.; Wani, A.; Vishwakarma, R.A.; Kumar, A.; Bharate, S.B. Meridianin derivatives as potent Dyrk1A inhibitors and neuroprotective agents. **Bioorganic and Medicinal Chemistry Letters**, 2015, 25, 2948-2952.
- Yadav, R.R.; Khan, S.I.; Singh, S.; Khan, I.A.; Vishwakarma, R.A.; Bharate, S.B. Synthesis, antimalarial and antitubercular activities of meridianin derivatives. **European Journal of Medicinal Chemistry**, 2015, 98, 160-169.
- Sharma, R.; Abbat, S.; Mudududdla, R.; Vishwakarma, R.A.; Bharatam, P.V.; Bharate, S.B. Ortho-quinone methides: TFA-mediated generation in water and trapping with lactams and styrenes. **Tetrahedron Letters**, 2015, 56, 4057-4059.
- Mahale, S.; Bharate, S.B.; Manda, S.; Joshi, P.; Jenkins, P.; Vishwakarma, R.A.; Chaudhuri, B. Anti-tumour Potential of N-(Biphenyl-2-yl)-Tryptoline (BPT): A Dual Inhibitor of Cdk4 and Tubulin Polymerization. **Cell death and Disease**, 2015, 6, e1743.
- Bharate, J.B.; Singh, S.; Wani, A.; Sharma, S.; Joshi, P.; Khan, I.A.; Kumar, A.; Vishwakarma, R.A.; Bharate, S.B. Discovery of 4-acetyl-3-(4-fluorophenyl)-1-(p-tolyl)-5-methylpyrrole as a dual inhibitor of human P-glycoprotein and Staphylococcus aureus Nor A efflux pump. **Organic & Biomolecular Chemistry**, 2015, 13(19):5424-31.
- Singh, B.; Kumar, A.; Joshi, P.; Guru, S.K.; Kumar, S.; Wani, Z.A.; Mahajan, G.; Hussain, A.; Qazi, A.; Kumar, A.; Bharate, S.S.; Gupta, B.D.; Sharma, P.R.; Dar, A.H.; Saxena, A.K.; Mondhe, D.M.; Bhushan, S.; Bharate, S.B.; Vishwakarma, R.A. Design and synthesis of colchicine derivatives with potent in vitro and in vivo anticancer activity and reduced p-glycoprotein induction liability. **Organic & Biomolecular Chemistry**, 2015, 13, 5674-5689.
- Bharate, J.B.; Batarseh, Y.S.; Wani, A.; Sharma, S.; Vishwakarma, R.A.; Kaddoumi, A.; Kumar, A.; Bharate, S.B. Synthesis and P-glycoprotein induction activity of colupulone analogs. **Organic & Biomolecular Chemistry**, 2015, 13, 5488-96.
- Sawant, S.D.; Reddy, G.L.; Dar, M.I.; Srinivas, M.; Gupta, G.; Sahu, P.K.; Mahajan, P.; Nargotra, A.; Singh, S.; Sharma, S.C.; Tikoo, M.; Singh, G.; Vishwakarma, R.A.; Syed, S.H. Discovery of Novel

Pyrazolopyrimidinone Analogs as Potent Inhibitors of Phosphodiesterase Type-5. **Bioorganic & Medicinal Chemistry**, 2015, 23, 2121-8.

- Raghupathy, R. ; Anilkumar, A.A.; Polley, A.; Singh, P.P.; Yadav, M.; Johnson, C.; Suryawanshi, S.; Saikam, V.; Sawant, S.D.; Panda, A.; Guo, Z.; Vishwakarma, R.A.; Rao, M.; Mayor, S. Transbilayer Lipid Interactions Mediate Nanoclustering of Lipid-Anchored Proteins. **Cell**, 2015, 161,581–594.
- Sharma, R.; Guru, S.K.; Jain, S.K.; Pathania, A.S.; Vishwakarma, R.A.; Bhushan, S.; Bharate, S.B. 3-(2,6-Dichloro-benzyloxy)-11-oxo-olean-12-ene-29-oic acid, a semisynthetic derivative of glycyrrhetic acid: Synthesis, antiproliferative, apoptotic and anti-angiogenesis activity. **Medicinal Chemistry Communications**, 2015, 6, 564-575.
- Mudududdla, R.; Guru, S.K.; Wani, A.; Sharma, S.; Joshi, P.; Vishwakarma, R.A.; Kumar, A.; Bhushan, S.; Bharate, S.B. 3-(Benzo[d][1,3]dioxol-5-ylamino)-N-(4-fluorophenyl)thiophene-2-carboxamide overcomes cancer chemoresistance via inhibition of angiogenesis and P-glycoprotein efflux pump activity. **Organic & Biomolecular Chemistry**, 2015, 13, 4296-4309.
- Mohammed, S.; Vishwakarma, R.A.; Bharate, S.B. Metal-free DBU promoted regioselective synthesis of isoxazoles and isoxazolines. **RSC Advances**, 2015, 5, 3470-3473.
- Mupparapu, Nagaraju.; Battini, Narsaiah.; Battula, Satyanarayana.; Khan, Shahnawaz.; Vishwakarma, R.A.; Qazi, Naveed Ahmed. Aminocatalytic Cross-Coupling Approach via Iminium Ions to Different C-C Bonds. **Chemistry**, 2015, 21, 2954–2960.
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- Rana, S.; Bhat, W.; Dhar, N.; Pandith, S.A.; Razdan, S.; Vishwakarma, R.; Lattoo, S.K. Molecular characterization of two A-type P450s, *WsCYP98A* and *WsCYP76A* from *Withania somnifera* (L.) Dunal: expression analysis and withanolide accumulation in response to exogenous elicitation. **BMC Biotechnology**, 2014, 14(1): 89.

- Kumar, S.; Pathania, A.S.; Guru, S.K.; Mupparapu, N.; Kumar, A.; Malik, F.; Bharate, S.B.; Qazi, N.A.; Vishwakarma, R.A.; Bhushan, S. A novel quinazolinone derivative induces cytochrome c interdependent apoptosis and autophagy in human leukemia MOLT-4 cells. **Toxicology Reports**, 2014, 1, 1013–1025.
- Rao, D.N.; Rasheed, S.k.; Vishwakarma, R.A.; Das, Parthasarathi. Copper-catalyzed sequential N-arylation of C-amino-NH-azoles. **Chemical Communications**, 2014, 50, 12911-12914.
- Mahale, S.; Bharate, S.B.; Manda, S.; Joshi, P.; Bharate, S.S.; Jenkins, P.R.; Vishwakarma, R.A.; Chaudhuri, B. Biphenyl-4-carboxylic acid [2-(1H-indol-3-yl)-ethyl]-methanamide (CA224), a non-planar analog of fascaplysin inhibits Cdk4 and tubulin polymerization: Evaluation of in vitro and in vivo anticancer activity. **Journal of Medicinal Chemistry**, 2014, 57, 9658-9672.
- Mudududdla, R.; Sharma, R.; Abbat, S.; Bharatam, P.V.; Vishwakarma, R.A.; Bharate, S.B. Synthesis of 2-phenyl-naphthalenes from styryl-2-methoxybenzenes. **Chemical Communications**, 2014, 50, 12076-12079.
- Jain, S.K.; Singh, S.; Khajuria, A.; Guru, S.K.; Joshi, P.; Meena, S.; Nadkarni, J.; Singh, A.; Bharate, S.S.; Bhushan, S.; Bharate, S.B.; Vishwakarma, R.A. Pyrano-isochromanones as IL-6 inhibitors: Synthesis, in-vitro and in-vivo anti-arthritis activity. **Journal of Medicinal Chemistry**, 2014, 57, 7085–7097.
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- Joshi, P.; Singh, S.; Wani, A.; Sharma, S.; Jain, S.K.; Singh, B.; Gupta, B.; Satti, N.; Koul, S.; Khan, I.A.; Kumar, A.; Bharate, S.B.; Vishwakarma, R.A. Osthol and curcumin as inhibitors of human P-gp and multidrug efflux pumps of Staphylococcus aureus: Reversing the resistance against frontline antibacterial drugs. **Medicinal Chemistry Communications**, 2014, 5, 1540–1547.
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- Jain, S.K.; Kumar, K. A. Aravinda.; Bharate, S.B.; Vishwakarma, R.A. Facile access to amides and hydroxamic acids directly from nitroarenes. **Organic and Biomolecular Chemistry**, 2014, 12, 6465-6469.
- Bhat, W.W.; Rana, S.; Dhar, N.; Razdan, S.; Pandith, S.A.; Vishwakarma, R.A.; Lattoo, S.K. An inducible NADPH-cytochrome P450 reductase from *Picrorhiza kurrooa*- an imperative redox partner of cytochrome P450 enzymes. **Functional and Integrative genomics**, 2014, 14(2), 381-399.
- Reddy, G. L.; Guru, S. K.; Srinivas, M.; Pathania, A. S.; Mahajan, P.; Nargotra, A.; Bhushan, S.; Vishwakarma, R. A.; Sawant, S.D. Synthesis of 5-substituted-1H-pyrazolo[4,3-d]pyrimidin-7(6H)-one analogs and their biological evaluation as anticancer agents: mTOR inhibitors. **European Journal of Medicinal Chemistry**, 2014, 80, 201-8.
- Bhat, W.W.; Razdan, S.; Rana S.; Dhar, N.; Wani, T.A.; Qazi, P.; Vishwakarma, R.; Lattoo, S.K. A phenylalanine ammonia-lyase ortholog (PkpAL1) from *Picrorhiza kurrooa* Royle ex. Benth:

Molecular cloning, promoter analysis and response to biotic and abiotic elicitors. **Gene**, 2014, 547(2), 245–256.

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- Bharate, J.B.; Wani, A.; Sharma, S.; Reja, S.I.; Kumar, M.; Vishwakarma, R.A.; Kumar, A.; Bharate, S.B. Synthesis, antioxidant, neuroprotective and P-glycoprotein induction activity of 4-arylquinoline-2-carboxylates. **Organic and Biomolecular Chemistry**, 2014, 12, 6267-6277.
- Lone, S.H.; Bhat, K.A.; Majeed, Rabiya.; Hamid, Abid. Click chemistry inspired facile synthesis and bioevaluation of novel triazolyl analogs of Ludartin. **Bioorganic & Medicinal Chemistry Letters**, 2014, 24(4), 1047-1051.
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- Jain, S.K.; Meena, S.; Gupta, A.P.; Kushwaha, M.; Uma Shaanker, R.; Jaglan, S.; Bharate, S.B.; Vishwakarma, R.A. Dysoxylum binectariferum bark as a new source of anticancer drug camptothecin: Bioactivity-guided isolation and LCMS-based quantification. **Bioorganic & Medicinal Chemistry Letters**, 2014, 24, 3146-3149.
- Sawant, S.D.; Hudwekar, A.D.; Kumar, K.A. Aravinda.; Venkateswarlu, V.; Singh, P.P.; Vishwakarma, R.A. Ligand- and base-free synthesis of phenols by rapid oxidation of arylboronic acids using iron(III) oxide. **Tetrahedron letters**, 2014, 55, 811–814.
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- Manda, S.; Khan, S.I.; Jain, S.K.; Mohammed, S.; Tekwani, B.L.; Khan, I.A.; Vishwakarma, R.A.; Bharate, S.B. Synthesis, antileishmanial and antitrypanosomal activities of N-substituted tetrahydro- β -carbolines. **Bioorganic & Medicinal Chemistry Letters**, 2014, 24, 3247-3250.
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- Yadav, Mahipal.; Raghupathy, Riya.; Saikam, Varma.; Dara, Saidulu.; Singh, Parvinder Pal.; Sawant, Sanghapal D.; Mayor, Satyajit; Vishwakarma, Ram A. Synthesis of non-hydrolysable mimics of glycosylphosphatidylinositol (GPI) anchors. **Org. Biomol. Chem**, 2014, 12, 1163-1172.
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