

**Sunil Vishnuprasadji Sharma**

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I am a synthetic chemist with keen interest in synthesis of bioactive molecules and developing analytical tools for biochemical processes. My research interests include total synthesis of natural products, multi-step synthesis and development of bio-analytical methods. My experience includes synthesis design and commercialisation on multinational collaborative projects involving biologists and IP experts.

**Employment Record**

- Royal Society Fellow, School of Chemistry, University of St. Andrews, Prof. R. J. M. Goss, April 2020-present
- Research Fellow, School of Chemistry, University of St. Andrews, Prof. R. J. M. Goss, Aug 2014-present
- Senior Research Associate, School of Pharmacy, University of East Anglia, Norwich, Dr. C. J. Hamilton May 2010-July 2014
- Post-doctoral Research Fellow, School of Chemistry, University of East Anglia, Norwich, Dr. S. P. Bew, June 2008-Sep 2009
- Senior Associate Tutor, School of Chemistry, University of East Anglia, Norwich. Jan 2004-May 2008
- Lecturer and Research Chemist (Organic & Medicinal Chemistry), Centre for Advanced Drug Research and Testing, JSS College of Pharmacy, Ooty, India. July 1999-Dec 2003
- Assistant Lecturer (Pharmaceutical & Organic Chemistry), VB Pharmacy College, Amravati, India (98-99), John's Pharmacy College, Bangalore, India (97-98) Oct 1997-June 1999

**Education**

**PhD (Synthetic Organic Chemistry)** University of East Anglia, Norwich, (Supervisor: Dr. S. P. Bew) Jan 2004-April 2008 (Awarded June 2008) *Thesis:* Studies towards the synthesis of (*S*)-tyrosine based calix[4]arenes and innovative synthetic protocols towards *para-tert*-butylcalix[n]arenes using conventional and microwave methods.

**Master of Pharmacy** (Pharmaceutical Chemistry) Dr M. G. R. Medical University, India 1994-1996.

**Bachelor of Pharmacy** (Pharmaceutical Sciences), Amravati University, India 1990-1994.

**Skills and Knowledge**

- Extensive experience in organic synthesis via multi-step and convergent routes, parallel synthesis, microwave-assisted organic reactions and biotransformations. Experience in developing chemical tools for applications at the interface of chemistry and biology.
- Extensive experience in using NMR, RP/chiral HPLC, FT-IR, UV-Vis, fluorimetry, LC-MS, automated chromatography, microwave/high pressure reactors and determination of physico-chemical properties.

**Selected Conference Presentations**

1. Living Genochemetics: Synchronous biosynthesis, bio-halogenation and catalytic cross-coupling in bacterial cultures, presented at CBNP11, Warwick; ECECR2 & Industry Chemistry Forum, St Andrews.
2. Chemical and chemoenzymatic syntheses of bacillithiol: An unusual thiol cofactor in *B. anthracis*, *S. aureus* and related pathogens, European Symposium of Organic Chemistry (ESOC-2011), Greece, 2011.
3. Total synthesis of bacillithiol: An unusual cofactor in *B. anthracis*, *B. cereus*, *S. aureus* and other Low G+C Gram positive bacterial pathogens, RSC Carbohydrate and Bio-organic Meeting, London, 2011.
4. Development of novel bioactive molecules using the calix[4]arene scaffold, presented at Bio-organic Chemistry Conference, Manchester and Medicinal Chemistry Symposium, Pfizer, Sandwich, 2007.

**Funding Awarded**

**2020:** Royal Society of Edinburgh – Enterprise Fellowship (Cohort-17, April 2020).

**2009:** Awarded UEA research travel grant and Pfizer grant for conference presentations.

**2004:** Awarded UEA and the School of Chemical Sciences & Pharmacy fellowships; received full funding for doctoral research (2004-2007) as an outstanding international scholar.

**2003:** Received four financial grants (total INR 140K) for the Post-Graduate research projects from Council for Scientific and Industrial Research (CSIR), India and Tamilnadu Pharmaceutical Sciences Welfare Trust (TNPSWT), India during 2000-2003.

#### Awards and honours

**2017:** **SCI Best Poster Prize** at 2<sup>nd</sup> EaST-Chem Early Career Researcher Conference, St. Andrews.

**2002-04:** Prof. S. B. Sonawane Memorial **Award for the Best Paper** in Pharmaceutical Chemistry section of the Indian Journal of Pharmaceutical Education & Research (*consecutive three years*).

**1999:** Awarded '**Best Oral Presentation**' for "Preliminary Phytochemical, Anthelmintic and Antimicrobial Studies on seeds of *Melia dubia*" at 51<sup>st</sup> Indian Pharmaceutical Congress' Annual Conference, Indore, India.

**1996:** Awarded three medals, namely The Indian Pharmaceutical Association Award, Shri N.M. Sood Gold Medal and Shri J.S.S. Mahaswami Award given by J.S.S. Mahavidyapitha, Mysore for the '**Best Outgoing Student**' in M. Pharm.

#### Selected Publications (Total research papers in peer-reviewed journals: 38)

1. A marine viral halogenase that iodinated diverse substrates, D.S. Gkotsi, H. Ludewig, **S. V. Sharma**, J.A. Connolly, J. Dhaliwal, Y. Wang, W.P. Unsworth, R.J.K. Taylor, M.M.W. McLachlan, S. Shanahan, J.H. Naismith & R. J. M. Goss, *Nature Chem.*, **2019**, 11, 1091–1097.
2. Buchwald-Hartwig diversification of unprotected halotryptophans, halotryptophan containing tripeptides and the natural product baretin in aqueous conditions, Y.J.G. Renault, R. Lynch, E. Marelli, **S. V. Sharma**, C. Pubill-Ulldemolins, J.A. Sharp, C. Cartmell, P. Cardenas & R.J.M. Goss\*, *Chem. Commun.*, **2019**, 55, 13653-13656.
3. Heck diversification of indole-based substrates under aqueous conditions: from indoles to unprotected halo-tryptophans and halo-tryptophans in natural product derivatives, C. Pubill-Ulldemolins, **S. V. Sharma**, C. Cartmell, J. Zhao, P. Cardenas & R.J.M. Goss\*, *Chem. Eur. J.*, **2019**, 25(46), 10866–10875.
4. Physiological studies of chlorobiaceae suggest that bacillithiol derivatives are the most widespread thiols in bacteria, J. Hiras, **S. V. Sharma**, V. Raman, R.A.J. Tinson, M. Arbach, D.F. Rodrigues, J. Norambuena, C.J. Hamilton & T.E. Hanson\*, *mBio.*, **2018**, 9(6), e01603-18.
5. GenoChemetics: Synthesis through Hyphenating Synthetic Biology and Synthetic Chemistry *in vivo*; **S. V. Sharma**, X. Tong, C. Pubill-Ulldemolins, C. Cartmell, E.J.A. Bogosyan, E.J. Rackham, E. Marelli, R.B. Hamed & R.J.M. Goss\*, *Nature Commun.*, **2017**, 8(10), 229.
6. Sonogashira Diversification of Unprotected Halotryptophans, Halotryptophan containing Tripeptides; and Generation of a New to Nature Bromo-natural Product and its Diversification in Water; M.J. Corr, **S. V. Sharma**, C. Pubill-Ulldemolins, R.T. Bown, P. Poirot, D.R.M. Smith, C. Cartmell, A. Abou-Fayad and R.J.M. Goss\*, *Chem. Sci.*, **2017**, 8, 2039
7. Pac13 is a small, monomeric dehydratase that mediates the formation of the 3'-deoxy nucleoside of pacidamycins; Michailidou, F., Chung, C., Brown, M.J.B., Bent, A. F., Naismith, J.H., Leavens, W.J., Lynn, S.M., **Sharma, S. V.** & Goss, R.J.M., *Angew. Chemie Int. Edn.*, **2017**, 56, 12492.
8. Mild, aqueous  $\alpha$ -arylation of ketones: towards new diversification tools for halogenated metabolites and drug molecules, Marelli, E., Renault, Y., **Sharma, S. V.**, Nolan, S.P. & Goss, R.J.M., *Chem. Eur. J.*, **2017**, 23(16), 3832-3836
9. Thiol redox and pKa properties of mycothiol, the predominant low molecular weight thiol cofactor in the Actinomycetes, **Sharma, S. V.**, Van Laer, K., Messens, J., Hamilton, C. J., *ChemBioChem* **2016**, 17 (18) 1689–1692.
10. Rapid enzyme regeneration results in the striking catalytic longevity of an engineered, single species, biocatalytic biofilm, Tong, X., Barberi, T. T., Botting, C. H., **Sharma, S. V.**, Simmons, M. J. H., Overton, T. W. & Goss, R. J. M., *Microbial Cell Factories*. **2016**, 15, 180.
11. A one-pot synthesis of symmetrical and unsymmetrical dipeptide ureas, Fayad, A. A., C. Pubill-Ulldemolins, **S. V. Sharma**, D. Day, and R. J. M. Goss\*, *Eur. J. Org. Chem.* **2015**, 25: 5603-5609
12. Biophysical features of bacillithiol, the glutathione surrogate of bacillus subtilis and other firmicutes; **S. V. Sharma**, M. Arbach, A.A. Roberts, C.J. Macdonald, M. Groom, C.J. Hamilton\*, *ChemBioChem* **2013**, 14(16):2160-2168.
13. Mechanistic studies of FosB: a divalent metal-dependent bacillithiol-S-transferase that mediates fosfomycin resistance in *Staphylococcus aureus*; A.A. Roberts, **S. V. Sharma**, A.W. Strankman, S.R. Duran, M. Rawat, C.J. Hamilton\*, *Biochem. J.*, **2013**, 451(1):69-79.

14. Cross-functionalities of Bacillus deacetylases involved in bacillithiol biosynthesis and bacillithiol-S-conjugate detoxification pathways; Z. Fang, A.A. Roberts, K. Weidman, **S. V. Sharma**, A. Claiborne, C.J. Hamilton, P.C. Dos Santos\*, *Biochem. J.*, **2013**, 454(2):239-247.
15. Chemical and chemoenzymatic syntheses of bacillithiol: A unique low molecular weight thiol amongst low G+C Gram-positive bacteria; **S. V. Sharma**, V.K. Jothivasan, G.L. Newton, H. Upton, J.I. Wakabayashi, M.G. Kane, M. Rawat, A.A. Roberts, J.J. La Clair and C.J. Hamilton\*, *Angew. Chem. Int. Edn.*, **2011**, 50(31), 7101-7104.
16. Do commercially available metal salts mediate calixarene formation via hydrogen-bonded dimers? S. P. Bew\* and **S. V. Sharma**, *J. Org. Chem.*, **2011**, 76(17), 7076-7083. (Highlighted as Controlling Calixarene Size with Metal Salts: The First Brønsted-Free Synthesis, *Synfacts*, 2011, 11, 1188)
17. Mass spectroscopic investigation of bis-1,3-urea calix[4]arenes and their ability to complex N-protected  $\alpha$ -amino acids; S.P. Bew\*, A.W.J. Barter, and **S. V. Sharma**, *J. Incl. Phenom. & Macrocycl. Chem.*, **2010**, 66, 195-208.

*Book Chapters:*

Natural products incorporating pyrimidine nucleosides, Michailidou, F., Burnett, D. A., **Sharma, S. V.**, Van Lanen, S. & Goss, R.J.M., Reference Module in Chemistry, Molecular Sciences and Chemical Engineering, 2020, Elsevier Inc.

Microwave Technology: A Step Towards Green Chemistry, **Sunil V. Sharma** and Shrishailappa Badami, in *Chemistry For Green Environment*, Srivastava, M. M., Sanghi, Rashmi (Edn), Narosa Pub House Published 2005/07; US-ISBN:8173196206