

Curriculum Vitae

Srinivas Hotha, PhD

Associate Professor – Chemistry
Indian Institute of Science Education & Research
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Academic Qualifications:

- 2001 PhD**
Chemistry Synthesis of Pentaarabinofuranosyl Motif A and Scyphostatin. Osmania University, Hyderabad; Research work at ICT, Hyderabad and NCL, Pune (*Advisor: Dr. Mukund K. Gurjgar*)
- 1995 MTech**
Biochem Engg Studies on Production and Purification of Alkaline Protease by *B. thuringiensis* H14 in Aqueous Two-phase Systems. IT-BHU, Varanasi.
- 1993 MSc**
Chemistry School of Chemistry, University of Hyderabad, Hyderabad.
- 1991 BSc**
Maths, Phys, Chem D. N. R. Autonomous College, Andhra University, Visakhapatnam.

Research Experience:

- 2010-...** Indian Institute of Science Education & Research, Pune; *Associate Professor*
- 2007-10** National Chemical Laboratory, Pune, India; *Scientist 'E1'*
- 2003-07** National Chemical Laboratory, Pune, India; *Scientist 'C'*
- 2001-03** The Rockefeller University, New York, NY, USA; *Postdoctoral Fellow*
- 1998-01** National Chemical Laboratory, Pune, India; *Senior Research Fellow*
- 1995-98** Indian Institute of Chemical Technology, Hyderabad, *Junior Research Fellow*
- 1993-9** Institute of Technology, BHU, Varanasi, India *Post-graduate Research Fellow*

Awards and Memberships:

- 1989** Secured Special Position in Mathematical Olympiad at A. P. State Level
- 1993-95** GATE Fellowship for M. Tech.
- 1995-2001** CSIR-JRF for Doctoral Studies
- 2002-2003** Revson Fellowship for Biomedical Sciences during Post-doctoral Studies

- 2004-.... Life Member of the Chemical Research Society of India (CRSI)
- 2005 Department of Atomic Energy Young Scientist Research Award
- 2006 Elected to Andhra Pradesh Academy of Sciences as Associate Fellow
- 2006 Indian National Science Academy Medal (INSA) for Young Scientists
- 2006 Council of Scientific & Industrial Research Young Scientist in Chem. Sci.
- 2007 RSC West India Section Young Scientist
- 2008-2011 Member of Royal Society of Chemistry
- 2009 NCL Research Foundation's *Scientist of the Year*
- 2010 AVRA Foundation Young Scientist
- 2010 SwarnaJayanthi Fellowship from Department of Science & Technology
- 2013-2018 Adjunct Visiting Professor in Departments of Chemistry, Biochemistry and Biotechnology, University of Pune
- 2014 CDRI Award for Excellence in Drug Research

Research Funding:

- 2005-2008 Department of Science & Technology (DST)
- 2007-2012 CSIR project on miRNA under XI Five Year Plan
- 2007-2012 Co-Principal Investigator of a CSIR project under XI Five Year Plan
- 2011-2015 SwarnaJayanthi Fellowship from Department of Science & Technology
- 2014-2017 Indo-French Center for Promotion of Advanced Research

Complete List of Publications

2015

56. Propargyl 1,2-Orthoesters for the Stereoselective Synthesis of Thioglycosides and 1-Thiotrehaloses, Boddu Venkateswarao Rao, Sujit Manmode and **Srinivas Hotha*** *Carbohydr. Res.* **2015**, (In Press)
55. Influence of Steric Crowding on Diastereoselective Arabinofuranosylations, Maidul Islam, Gaddamanugu Gayatri, and **Srinivas Hotha*** *J. Org. Chem.* **2015**, *80*, 7937-7945.
54. Propargyl 1,2-Orthoesters for a Catalytic and Stereoselective Synthesis of Pyrimidine Nucleosides, Boddu Venkateswara Rao, Sujit Manmode and **Srinivas Hotha*** *J. Org. Chem.* **2015**, *80*, 1495-1505.
53. Transition Metals for the Synthesis of Glycopolymers and Glycopolypeptides, Maidul Islam, Ashif Y. Shaikh and **Srinivas Hotha*** *Isr. J. Chem.* **2015**, *55*, 373-382.

2014

52. Hypervalent Iodine Mediate Synthesis of C-2 Deoxy Glycosides and Amino Acid Glycoconjugates, Maidul Islam, Nishanth D. Tirukoti, Shyamapada Nandi and **Srinivas Hotha*** *J. Org. Chem.* **2014**, *79*, 4470-4476
51. Efficient Synthesis of oligosaccharyl 1,2-O-orthoesters from *n*-pentenyl glycosides and application to the pentaarabinofuranoside of the mycobacterial cell surface, Shivaji A. Thadke and **Srinivas Hotha*** *Org. Biomol. Chem.* **2014**, *12*, 9914-9920.
50. Gold(III)-Catalyzed Glycosidations for 1,2-trans and 1,2-cis Furanosides, Shivaji A. Thadke, Bijoyananda Mishra and **Srinivas Hotha*** *J. Org. Chem.* **2014**, *79*, 7358-7371.
49. Cationic Charged Helical Glycopolypeptide Using Ring Opening Polymerization of 6-Deoxy-6-azido-glyco-N-carboxyanhydride, Ashif Y. Shaikh, Somen Das, Debasis Pati, Vinita Dhaware, Sayam Sen Gupta,* and **Srinivas Hotha** *Biomacromolecules*, **2014**, *15*, 3679-3686.

2013

48. A tetrazine templated method for the synthesis of ternary conjugates, Venkateswara Rao Boddu, Snehal Dhokale, Pattuparambil Rajamohanam and **Srinivas Hotha*** *Chem. Commun.* **2013**, *49*, 10808-10810.
47. Gold-catalyzed glycosidation for the synthesis of trisaccharides by applying the armed-disarmed strategy, Abhijeet K. Kayastha and **Srinivas Hotha*** *Beil. J. Org. Chem.* **2013**, *9*, 2147-2155.

46. Facile synthesis of β - and α -arabinofuranosides and application to cell wall motifs of *M. tuberculosis*, Shivaji A. Thadke, Bijoyananda Mishra and [Srinivas Hotha*](#) *Org. Lett.* **2013**, *15*, 2466-2469.

45. Synthesis and self-assembly of amphiphilic homoglycopolypeptide, Vineeta Dhaware, Ashif Y. Shaikh, Mrityunjoy Kar, [Srinivas Hotha*](#) and Sayam Sen Gupta* *Langmuir* **2013**, *29*, 5659-5667.

2012

44. AuBr₃ mediated glycosidations: synthesis of tetrasaccharide motif of the *Leishmania donovani* lipophosphoglycan, Gopalsamy Sureshkumar and [Srinivas Hotha*](#) *Glycoconjugate J.* **2012**, *29*, 221-230.

43. Versatile Gold Catalysed Transglycosidation at Ambient Temperature, Abhijit K. Kayastha and [Srinivas Hotha*](#) *Chem Commun* **2012**, *48*, 7161-7163.

42. "Click" Chemistry Guided Carbohydrate Mediated Imaging of Bacteria and Yeast, Ashish Tripathi, Gopala Krishna Aradhyam* and [Srinivas Hotha*](#) *Adv. Exp. Med. Biol.* **2012**, *749*, 313-327.

41. Synthesis of thioglycosides from propargyl glycosides exploiting alkynophilic gold catalyst, Srinivasa Rao Vidadala, Shivaji A. Thadke, [Srinivas Hotha*](#) and Sudhir Kashyap*, *J. Carbohydr. Chem.* **2012**, *31*, 241-251.

40. Controlled Synthesis of O-Glycopolypeptide polymers and their molecular recognition with lectins, Debasis Pati, Ashif Y. Shaikh, Soumen Das, Musti J. Swamy,* [Srinivas Hotha*](#) and Sayam Sen Gupta* *Biomacromolecules* **2012**, *13*, 1287-1295.

2011

39. Propargyl/Methyl Furanosides as Potential Glycosyl Donors, Srinivasa Rao Vidadala, G. Gayatri, Gaddamannugu Gayatri, G. Narahari Sastry* and [Srinivas Hotha*](#), *Chem. Commun.* **2011**, *47*, 9906-9908.

38. Lewis acid-catalyzed stereoselective lactonization and subsequent glycosidation of 2-C-malonyl carbohydrates Tukaram M. Pimpalpal; Srinivasa Rao Vidadala; [Srinivas Hotha*](#) and Torsten Linker* *Chem Commun.* **2011**, *47*, 10434-10436.

37. Gold Catalyzed Glycosidations for the Synthesis of Sugar Acrylate/Acrylamide Hybrids and Glycopolymers, Shivaji A. Thadke, Mrityunjoy Kar, Sayam S. Sengupta and [Srinivas Hotha*](#) *Carbohydr. Res.* **2011**, *346*, 1511-1518.

36. Gold Catalyzed Reactions of 2-C-Branched Carbohydrates: Mild Glycosidations and Selective Anomerizations, Srinivasa Rao Vidadala, Tukaram M. Pimpalpal,

Torsten Linker,* and [Srinivas Hotha](#)*, *Eur. J. Org. Chem.* **2011**, 2426-2430.

35. Synthesis of glycopolypeptides by the ring opening polymerization of O-glycosylated- α -amino acid N-carboxyanhydride (NCA), Debasis Pati, Ashif Y. Shaikh, [Srinivas Hotha](#) and Sayam Sen Gupta, *Poly. Chem.* **2011**, 2, 805-811.

34. Facile Synthesis of unusual glycosyl carbamates and amino acid glycosides from Propargyl 1,2-Orthoesters, Ashif Y. Shaikh, Gopalsamy Sureshkumar, Sayam Sengupta* and [Srinivas Hotha](#)* *Org. Biomol. Chem.* **2011**, 9, 5951-5959.

33. Spectroscopic and DNA binding properties of 9- β -amino alkyl ether derivatives of berberine, Islam, M. M, Basu, A., Hossain, A., [Srinivas Hotha](#), Sureshkumar, G., Kumar, G. S. *DNA and Cell Biology* 2011, 30, 123-133.

2010 (from NCL)

32. Gold catalyzed glycosidations: synthesis of 1,6-anhydro saccharides Shivaji A. Thadke and [Srinivas Hotha](#)* *Tetrahedron Lett.* **2010**, 51, 5912-5914.

31. Gold catalyzed glycosidations: Unusual cleavage of the interglycosidic bond while studying the armed disarmed effect of propargyl glycosides Abhijeet K. Kayastha and [Srinivas Hotha](#)* *Tetrahedron Lett.* **2010**, 51, 5269-5272.

30. 'Clicking' molecular hooks on silica nanoparticles to immobilize catalytically important metal complexes: The case of gold catalyst immobilization, Anal Ganai, Rima Bhardwaj, [Srinivas Hotha](#), Sayam Sengupta, Prasad L V Bhagavatula, *New J. Chem.* **2010**, 34, 2662-2670.

2009 (from NCL)

29. Orthogonal Activation of Propargyl and *n*-Pentenyl Glycosides and 1,2-Orthoesters, Srinivasa Rao Vidadala, Shivaji A. Thadke and [Srinivas Hotha](#)* *J. Org. Chem.* **2009**, 74, 9233-9236.

28. Methyl Glycosides Are Identified as Glycosyl Donors for the Synthesis of Glycosides, Disaccharides and Oligosaccharides, Srinivasa Rao Vidadala and [Srinivas Hotha](#)* *Chem Commun* **2009**, 2505-2507.

27. Dendritic Effect of Ligand Coated Nanoparticles: Enhanced Apoptotic Activity of Silica-Berberine-Nanoconjugates, Mahantappa Halimani, S. Prathap Chandran, Sudhir Kashyap, V. M. Jadhav, B. L. V. Prasad,* [Srinivas Hotha](#)*, Souvik Maiti* *Langmuir* **2009**, 25, 2339-2347.

2008 (from NCL)

26. Tunable surface modification of Silica Nanoparticle through 'click' chemistry, S. Prathap Chandran, Sudarsan Tamang, [Srinivas Hotha](#)* and B. L. V. Prasad* *Curr.*

Sci. **2008**, *95*, 1327-1333.

25. Gold Mediated Glycosidations: Selective Activation of Propargyl 1,2-Orthoesters in the Presence of Aglycones Containing Propargyl Moiety, Gopalsamy Sureshkumar and [Srinivas Hotha](#)* *Chem. Commun.* **2008**, 4282-4284.

24. Synthesis of 1,2,3-triazole and 1,2,3,4-tetrazole-fused glycosides and nucleosides by an intramolecular 1,3-dipolar cycloaddition reaction, Ramakrishna I. Anegundi, Vedavati G. Puranik and [Srinivas Hotha](#)* *Org. Biomol. Chem.* **2008**, *6*, 779-786.

2007 (from NCL)

23. Synthesis of C-2 methylene glucosides from C-2-propargyloxymethyl glucals exploiting the alkynophilicity of AuCl₃, Sudhir Kashyap, Srinivasa Rao Vidadala and [Srinivas Hotha](#)* *Tetrahedron Lett.* **2007**, *48*, 8960-8962.

22. Propargyl 1,2-orthoesters as glycosyl donors: stereoselective synthesis of 1,2-*trans* glycosides and Disaccharides, [Srinivas Hotha](#)* and Gopalsamy Sureshkumar *Tetrahedron Letters* **2007**, *48*, 6564-6568.

21. Controlled aggregation of gold nanoparticle networks induced by alkali metal ions, Sudarsan Tamang, [Srinivas Hotha](#)*, B. L. V. Prasad* *J. Nanosci. Nanotechnol.* **2007**, *7*, 2683-2689.

2006 (from NCL)

20. Diversity oriented synthesis of small molecule libraries, [Srinivas Hotha](#) *Chem. Ind. Dig.* **2006**, *XIX (5)*, 51-56. (Review)

19. Propargyl glycosides as stable glycosyl donors: Anomeric activation and glycoside syntheses, [Srinivas Hotha](#)* and Sudhir Kashyap *J. Am. Chem. Soc.* **2006**, *128*, 9620-9621.

18. Synthesis of spiroannulated dihydroisobenzofuranylated monosaccharides, Sushil K. Maurya and [Srinivas Hotha](#)* *Tetrahedron Lett.* **2006**, *47*, 3307-3310.

17. Stereoselective synthesis of α -glucosides from 3-O-propargyl protected glucal exploiting the alkynophilicity of AuCl₃, Sudhir Kashyap and [Srinivas Hotha](#)* *Tetrahedron Lett.* **2006**, *47*, 2021-2023.

16. "Click" chemistry inspired synthesis of pseudo-oligosaccharides and amino acid glycoconjugates, [Srinivas Hotha](#)* and Sudhir Kashyap *J. Org. Chem.* **2006**, *71*, 364-367, 852. (Most-Cited Article published in 2006 and cited through the period ending December 31, 2007.: ACS Website)

2005 (from NCL)

- Diversity oriented synthesis of tricyclic compounds from glycals using the Ferrier and the Pauson-Khand reactions, [Srinivas Hotha](#)* and Ashish K. Tripathi *J. Comb. Chem.* **2005**, *7*, 968-976.
- Gold Nanoparticle Networks with Photo-Responsive Interparticle Spacings, D. S. Sidhaye, Sudhir Kashyap, Murali Sastry, [Srinivas Hotha](#)* and B. L. V. Prasad* *Langmuir*, **2005**, *21*, 7979-7984.
- Stereoselective synthesis of spiroannulated cyclopentenones by the Pauson-Khand reaction on carbohydrate derived enynes, [Srinivas Hotha](#)*, Sushil K. Maurya and Mukund K. Gurjar *Tetrahedron Lett.* **2005**, *46*, 5329-5332.
- Expedient synthesis of 1,2,3-triazole-fused tetracyclic compounds by intramolecular Huisgen ('Click') reactions on carbohydrate-derived azido-alkynes, [Srinivas Hotha](#)*, R. I. Anegundi and Arvind A. Natsu *Tetrahedron Lett.* **2005**, *46*, 4585-4588.
- Niobium(V) chloride catalyzed microwave assisted synthesis of 2,3-unsaturated O-glycosides by the Ferrier reaction, [Srinivas Hotha](#)* and Ashish K. Tripathi *Tetrahedron Lett.* **2005**, *46*, 4555-4558.

2001-2003 (from Post-doc)

- Selective killing of nonreplicating mycobacteria, Bryk, R.; Gold, B.; Venugopal, A.; Singh, J.; Samy, R.; Pupek, K.; Cao, H.; Popescu, C.; Gurney, M.; [Hotha, S.](#); Cherian, J.; Rhee, K.; Ly, L.; Converse, P. J.; Ehrt, S.; Vandal, O.; Jiang, X.; Schneider, J.; Lin, G.; Nathan, C.* *Cell Host & Microbe* **2008**, *3*, 137-145.
- HR22C16: A potent small molecule probe for the dynamics of cell division, [Srinivas Hotha](#), Justin C. Yarrow, Janet G. Yang, Sarah Garrett, K. V. Renduchintala, Thomas U. Mayer and Tarun M. Kapoor* *Angew. Chem. Int. Ed.* **2003**, *42*, 2379-2382.

1998-2001 (from PhD)

- Role of asymmetric catalysts in chiral drug synthesis, Mukund K. Gurjar,* [Srinivas Hotha](#) and A. M. S. Murugaiah *Chem. Ind. Dig.* **2001**, *14*, 86-94.
- Synthesis of oligosaccharides of motifs D and E of arabinogalactan present in *Mycobacterium tuberculosis*, Mukund K. Gurjar,* L. K. Reddy and [Srinivas Hotha](#) *J. Org. Chem.* **2001**, *66*, 4657-4660.
- Synthesis of 5-O-(α -D-arabinofuranosyl)-6-O-(α -D-galactofuranosyl)- β -D-galactofuranoside present in motif E of *Mycobacterium tuberculosis* cell wall, Mukund K. Gurjar,* L. K. Reddy and [Srinivas Hotha](#) *Organic Lett.* **2001**, *3*, 321-323.
- Applications of catalytic organic reactions in fine chemicals and pharmaceuticals, Mukund K. Gurjar,* [Srinivas Hotha](#) and A. M. S. Murugaiah *La Chimica de*

Industrica 2001, 1-12.

4. Towards the synthesis of scyphostatin, Mukund K. Gurjar,* and [Srinivas Hotha](#) *Heterocycles* 2000, 53, 1885-1889.
3. Synthesis of pentaarabinofuranosyl structure motif A of *Mycobacterium tuberculosis*, Hari Babu Mereyala, [Srinivas Hotha](#) and Mukund K. Gurjar *J. Chem. Soc. Chem. Commun.* 1998, 685-686.

1993-1995 (From MSc and MTech)

2. Production of alkaline protease by *Bacillus thuringiensis* H 14 in aqueous two- phase systems, [Srinivas Hotha](#) and Rathindra M. Banik* *J. Chem. Technol. Biotechnol.* 1997, 69, 5-10.
1. Electronic structure study of the reactivity centres in Ti_8C_{12} clusters, G. Naga Srinivas, [Hotha Srinivas](#) and E. D. Jemmis* *Proc. Indian Acad. Sci. (Chem. Sci.)* 1994, 106, 169-181.

Summary of Research Contributions by Dr. Srinivas Hotha

Dr Srinivas Hotha has made outstanding contributions to exploration of the structural diversity of saccharides for the synthesis of small molecules with novel applications in biology and/or material sciences. Dr. Hotha's research has evolved from total synthesis of complex natural products during his PhD and diversity oriented synthesis in early independent career and, to present original contributions in chemical glycosidation. His discovery of gold catalyzed glycosidation from stable alkynyl glycosyl donors to form saccharides has added a new repertoire to the science of oligosaccharide synthesis. Dr. Hotha has exploited the chemical diversity of carbohydrates for the synthesis of scaffolds that are complex, chiral, multi-cyclic, oxygen-rich and natural product-like (*J. Comb. Chem.* **2005**, *7*, 968-976; *Tet. Lett.* **2006**, *46*, 4985-4588; 5329-5332) architectures. His group has utilized combination of known contemporary reactions such as Pauson-Khand reaction, CuAAC or 'Click' reaction and other cycloadditions to design protocols for complexity generation. A fortuitous finding of AuCl₃ by him led to salient applications of gold chemistry on carbohydrate scaffolds to achieve a library of isobenzofuran annulated spirocyclic small molecules with high selectivity (*Tet Lett* **2006**, *47*, 3307-3310). Later on a series of observations (*Tet Lett* **2006**, *47*, 2021-2023; *ibid* **2007**, *48*, 8960-8962) emerged to the discovery of propargyl glycosides as novel glycosyl donors (*J Am Chem Soc* **2006**, *128*, 9620-9621; 17153-17154). During the last 8 years, Dr Hotha developed a suite of protocols for the synthesis of complex glycoconjugates. The glycosyl donors developed by him are orthogonal to the existing glycosidation methods (*J. Org. Chem.* **2008**, *74*, 9233-9236). By the use of combinatorial substrate-catalyst screening strategy, he has shown that ethynyl cyclohexyl glycosides are the best glycosyl donors for transglycosidation at room temperature (*Chem Comm* **2012**, *48*, 7161-7163). The efficacy of Hotha's protocols is reflected in the successful synthesis of complex carbohydrate epitopes of infectious bacteria (*Glycoconj J* **2012**, *29*, 221-230; *Org Lett* **2013**, *15*, 2466-2469), which are otherwise was untenable.

Dr. Hotha's work on the modular nature of CuAAC or popular 'click' chemistry for the conjugation of biomolecules (*J Org Chem* **2006**, *71*, 364-367; 852) has been very highly cited by carbohydrate community and has recently led him to develop a ternary conjugation protocol by combination of SNAr and inverse electron demand Diels-Alder reactions (*Chem Commun.* **2013**, *49*, 10808-10810).

Dr Hotha has collaborated with practitioners of materials and biology to develop new molecular probes: With Dr Prasad (NCL), he has developed a photoswitchable nanoassembly (*Langmuir* **2005**, *21*, 7979-7984); with Dr. Maiti (IGIB), he exploited the dendritic nature of silica nanoparticles to enhance the efficacy of natural products (*Langmuir* **2009**, *25*, 2339-2347); in collaboration with Dr.Gupta (NCL) he synthesized a variety of glycopolypeptides (*Poly Chem* **2011**, *2*, 805-811) that are, fluorescent, water soluble and amphiphilic with excellent self assembling properties (*Biomacromol* **2012**, *13*, 1287-1295). He and Dr Linker (Potsdam), used the gold catalysis repertoire to the synthesis of complex glycomimetics (*Eur J Org Chem* **2011**, 2426-2430; *Chem Comm* **2011**, *47*, 10434-10436) by methyl glycoside activation which otherwise was extremely difficult.

Dr Hotha's recent efforts are directed on the development of a diagnostic tool for the nonpulmonary tuberculosis. Towards this, he devised a strategy for stereoselective synthesis of both α,β -furanosides using gold(III) catalysis. α -Furanosides initially obtained by 1,2-orthoester strategy was converted to β -furanosides via oxidation followed by reduction (*Org. Lett.* **2013**, *15*, 2466-2469) mimicking the biosynthetic pathway. This method is being currently employed for the synthesis of a challenging pentadodecaarabinofuranosyl arabinogalactan (25-mer), which is one of the major carbohydrate epitopes in the *Mycobacterium tuberculosis*.

The impact of the glycosyl donor chemistry developed by his group is realized by the facts that several prominent practitioners of glycochemistry [Jiangong Zhu - University of Toledo, USA; Biao Yu - Shanghai Institute of Organic Chemistry, China; Finn - Scripps Research Institute, USA; Kunz – Institut für

Organische Chemie, Germany; and Balamurugan – University of Hyderabad], are implementing his reaction in the synthesis of their glycotargets. Overall, Dr Hotha has discovered and pioneered the chemistry of gold catalyzed glycosidations and developed it into a highly complementary alternative for the well known Schmidt's trichloroacetamidates and Fraser-Reid's *n*-pentenyl glycosidation methods.

Short summary:

Dr. Srinivas Hotha has discovered and pioneered the original chemistry of gold-catalyzed glycosidation reaction and developed a suite of protocols for glycosidations by allied catalytic methods. These have lead to successful and challenging synthesis of complex glycomimetics, glycopolymers and epitopes of infectious bacteria that were otherwise inaccessible.