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Taming Arynes to Access Bioactive Molecules

S. Chandrasekhar*
Director, CSIR-IICT Hyderabad
IICT Hyderabad,
E-mail: srivaric@iict.res.in

Abstract:
Arynes are highly reactive intermediates, but extremely strained and kinetically unstable. Although, the first experimental support for the existence of benzyne was observed in 1953,[1] very limited numbers of synthetic applications available due to harsh reaction conditions required to generate these intermediates. However, after the discovery of o-silyl aryl triflates as aryne precursors under mild reaction conditions,[2] arynes have been widely employed for the construction of various biologically active molecules including natural products.[3] Our efforts on exploitation of arynes in the synthesis of various bio-actives such as cephalotaxine, galanthamine, benzofurans, biaryls, benzannulated derivatives etc. will be discussed.[4] In addition, the aryne insertion onto abundantly available natural products glycyrrhetinic acid and malabaricol as novel scaffolds towards discovery of potential anti-cancer drugs will also be presented.[5]

References and Notes:

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Bio-Sketch of Speaker

Srivari Chandrasekar
Director
CSIR-IICT Hyderabad
Hyderabad, INDIA
e-Mail: srivaric@iict.res.in

Homepage: https://www.iict.res.in/people/director?type=basic

Dr. Srivari Chandrasekhar, born in 1964, completed all his primary and higher education in Hyderabad and Joined CSIR, IICT for a Ph. D Programme. After completing his Ph. D (1991) with the then director Dr. A. V. Rama Rao, he moved to USA for a post-doctoral position with Prof. J. R. Falck (1991-94). He joined CSIR-IICT as Scientist C in 1994 and grew upto the level of director in 2015. He is a fellow of all the three Indian Science academies, i.e., National Academy of Sciences, Indian Academy of Sciences and Indian National Science academy. He is also an Alexander von Humboldt fellow.

He has made significant contributions in diverse areas of organic chemistry with a special emphasis on chiral chemistry, total synthesis of biologically active natural products and pharmaceutical products. He introduced polyethylene glycol (PEG) as a novel, environmentally benign solvent medium. He has developed technologies for the synthesis of latest anti-tuberculosis drug, bedaquiline; anti-tumor and abortive drug, misoprostol; anti-platelet molecule, beraprost; antidepressive compound, sertralin and drug for treatment of schizophrenia, asenapine.

He has more than 285 publications with 7600 citations. 80 students have been already awarded Ph. D. degree under his able guidance and 20 post-doctoral associates have worked in his group. He has received several accolades including Eminent Scientist Award for contributions in the field of Chemistry from Telangana State Government in 2017, CNR Rao National Prize for Chemical Research 2012, CSIR Technology award 2014 and Infosys prize in Chemical sciences 2014 for his contributions in synthetic organic chemistry with special focus on the synthesis of complex molecules from natural sources and innovative, practical approaches to pharmaceuticals of current interest to industry.