



Dr. Rajendra Rathore Colloquium of Chemistry

Department of Chemistry

Indian Institute of Technology Kanpur

Professor S. Chandrasekaran

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Department of Organic Chemistry,
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Title: Studies on the Stereoselective Synthesis of 2-Deoxy-glycosides

Abstract 2-Deoxy and 2,6-dideoxy-glycosides are integral part of many biologically active natural products such as angucyclines, anthracyclines, aureolicacids, cardiac glycosides, avermectins, and pluramycins. As a result, many methods have been developed for the synthesis of 2-deoxy-glycosides but the main problems encountered are the formation of glycal under acidic conditions and the uncertain stereochemical outcome in the absence of C-2 hydroxyl group. Although the structures of deoxy-sugars are diverse, they all share one commonality. Specifically, the lack of oxygenation at C-2 precludes the use of well-established strategies for controlling the selectivity in the glycosylation reactions used for their assembly into larger oligosaccharides. Accordingly, there has been sustained interest in methods for their synthesis over the past few decades. The approaches that have been developed can be broadly categorized into five basic classes of reactivity: direct synthesis, indirect synthesis, addition to glycals, de novo synthesis, and anomeric alkylation-based approaches.

The main focus of our work is developing new glycosylation reactions that permit the mild, selective and direct construction of deoxyglycosides using 2-deoxy-sugar donors. Our preliminary results on the utilization of 2-deoxyglycosyl 3-benzoylpropionates as novel glycosyl donors for α -selective glycosylation will be presented in this lecture. These donors can be successfully utilized with a variety of acceptors (primary, secondary and tertiary alcohols) for the synthesis of 2-deoxy-glycosides. Additionally, these newly developed glycosyl donors are also efficient for the synthesis of trisaccharides.

Professor S. Chandrasekaran

earned his B.Sc (1965) and M.Sc (1967) degree from Ramakrishna Mission Vivekananda College, Madras University. He obtained Ph.D from Madras University under the guidance of Professor S. Swaminathan in 1972. After graduation, he went to Harvard University, USA (1973-75 and 1976-77) to work as a Research Associate on the (first successful) synthesis of gibberellic acid, a plant growth hormone, with Professor E. J. Corey. He joined IIT Kanpur in 1977 as a Lecturer and became a full professor in 1985. He then moved to IISc Bangalore and held various positions as Chairman, Department of Organic Chemistry, and Dean of Faculty of Science, IISc Bangalore.

He has made numerous research contributions in the area of development of new synthetic methodologies and synthesis of natural products. Some of his important contributions are (a) Mo-S and W-Se complexes as sulfur/selenium transfer agents and study of induced internal redox reactions and (b) synthetic methodologies developed for peptides and carbohydrate derivatives besides the chemistry of glycoaminoacids, glycosidase inhibitors, urease inhibitors, organometallic chemistry, catalysis and hybrid organic-inorganic materials. He has published over 250 research articles and mentored over 100 coworkers including graduate students and post-doctoral fellows.

Prof. Chandrasekaran has been conferred with several awards notably, The Shanti Swarup Bhatnagar Prize in 1989, CRSI Silver Medal, 2007 INSA Golden Jubilee Commemoration Medal and IISc Alumni Award and JC Bose National Fellowship of DST. He is a Fellow of The Indian National Science Academy, The Indian Academy of Sciences, and The World Academy of Sciences (TWAS). He has also served as Editor for the Elsevier journal, *Tetrahedron Letters*.



About the Colloquium and Professor Rajendra Rathore

"Dr. Rajendra Rathore Colloquium of Chemistry" seminar series has been established at the Department of Chemistry, IIT Kanpur, through an endowment fund created through generous contributions from Mrs. Rajni Nigam, wife of late Dr. Rajendra Rathore, and their family members and well-wishers.

Dr. Rajendra Rathore, Pfletschinger-Habermann Professor of Organic Chemistry at Marquette University, Milwaukee, Wisconsin USA, departed this world on February 16, 2018, after a short but strenuous battle with pulmonary disease. Dr. Rathore was an alumnus of Indian Institute of Technology Kanpur who received his M.Sc. degree in Chemistry in 1986. Dr. Rathore was a scientist of the highest calibre. A pioneer in the field of organic and synthetic chemistry, he made key contributions to the areas of organic supramolecular and materials chemistry.



Date: March 04, 2020 (Wednesday)

Time: 5:30 PM

Venue: Outreach Auditorium