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CARBOHYDRATE NEWS LETTER

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FROM THE EDITOR'S DESK ...

In continuation of the remarkable achievements of Association of Carbohydrate Chemists and Technologists of India (ACCT(I)) during last many years, I am glad to present the 18th issue of Carbohydrate News Letter (CNL) here before you. I feel immense pleasure as being a part of ACCT(I) and am grateful for their support in bringing forward CNL-2017.

The miraculous world of carbohydrates provides much more than our imagination. Their interesting chemistry and biochemistry give a point to ponder to researchers throughout the world. Carbohydrates comprise the most abundant, diverse and complex class of biomolecules. Their crucial role in biological processes enhances their significance in drug discovery. Carbohydrates assist bio-chemistry of energy storage, intercellular adhesion, protein function modulation, signal transduction, viral and bacterial cell surface recognition and malignant transformation which show the pharmacological value of glycoconjugates. Carbohydrate consist a range of shapes, size, composition and orientation and thus they are most suitable in development of complex therapeutic molecules. Besides several well known carbohydrate-based drugs available in market, such as, BGM-Galectin, GSC100, GM-CT-01, GM-MD-02, and many more carbohydrate derived molecules have also been used as a great diagnostic tool. Radiolabeled carbohydrate derivatives are proven to be great imaging probes with single photon emission computed tomography (SPECT) and positron emission tomography (PET). 2-Deoxy-2-[18F]fluoro-D-glucose ([18F] FDG) is the first carbohydrate based radiotracer and is among the most vastly used radiotracers used in PET imaging. Moreover, due to increased consumption of carbohydrate moiety by tumor cells, glycoconjugate chelates have shown enormous potency in metabolic evaluation of tumors in form of *in vivo*- and *in vitro*- stable complexes by labeling with suitable organometallic cores.

High functionality and easy modifiable skeleton of carbohydrates provides a suitable framework to build glyco-clusters, dendrimers and macrocycles. Glyco-clusters are vastly applicable in inhibition of different galectins, lectins and glycosidases and as drug delivery systems and nucleotides. Glyco-dendrimers have also shown potency in biomedicine and drug delivery. Glyco-macrocycles exhibit a wide range of applicability starting from glycolipid analogues, protein ligands, enzyme inhibitors/substrates, bioactive cyclopeptides mimetics, quadruplex DNA binders and biomaterials to chiral recognition, asymmetric catalysis and receptors for ions and organic compounds.

These examples are only a glimpse of the immeasurable utility of glycoconjugates in drug development and pharmacology. With the increasing applications of glycobiology, the demand of glycochemistry and expectations from glycochemists is also increasing day by day. This fascinating field is attracting worldwide researchers towards applying new techniques and technologies in glycochemistry to explore this miraculous world of carbohydrates for development of new interesting ideas and biological applicability.

Wide discussions, interactions and exchange of ideas in glycoscience are need of time and ACCT(I) makes an effort to communicate this message through this news letter. So far ACCT(I) successfully held 32 carbohydrate conferences including two international symposiums and a satellite event at Varanasi, on the occasion of centenary year celebration of Banaras Hindu University. The present issue is a reflection of support, guidance, hard work and dedication of all the members of ACCT(I) as well as the carbohydrate researchers all over the country and abroad. I hope that this issue will be able to communicate the advancements in glycoscience and inspire the new researchers to be a part of ACCT(I) to explore this field more and more.

With Best Wishes & New Year Greetings

Vinod K.Tiwari

Editor, Carbohydrate News Letter

Presidential Address, CARBO-XXXI, Delhi
(November 14-16, 2016)

Dear Professor JP Khurana, Pro-Vice-Chancellor, University of Delhi, Professor Devesh Sinha, Dean Colleges, University of Delhi, Professor Gurmeet Singh, Head, Department of Chemistry, University of Delhi, Dr PL Soni, Editor-in-Chief , TCR and Chief Advisor, ACCT(I), Professor Ashok Prasad, Secretary, ACCT(I), distinguished guests, academicians, researchers & industrialists, my dear students, ladies and gentlemen, a very good morning to you all. On behalf of the executive committee of the Association of Carbohydrate Chemists and Technologists India (ACCT(I)) it is my great pleasure to welcome you all to this 31st CARBO being organized by the Department of Chemistry, University of Delhi and ACCT(I).

Friends and colleagues, for those of you who are not familiar with ACCT(I), the Association of Carbohydrate Chemists and Technologists (India) was formed in 1984 at ATIRA, Ahmedabad at its first ever Meeting, with Dr Srivastava as its founder President. Dr Srivastava continued to serve the Association as its president until passing away in 1995. After the first two CARBO conferences between 1984 and 1986 at ATIRA organized by Dr Srivastava, the Meeting was taken to the campus of CFTRI in Mysore by Dr KR Bhattacharya who organized CARBO-III in1987. The annual Meeting of the Association (ACCT(I)) in the form of CARBO series of meetings have since travelled the length and breadth of the country, with the Association also growing steadily under the successive leadership of its past presidents. Undoubtedly after Dr Srivastava, Dr Soni has been the key person in turning the Association into what it is today. Publication of Carbohydrate News Letter(CNL) and its flagship e-journal, Trends in Carbohydrate Research(TCR) with its four Issues a year, are the other two important activities of the Association, other than the annual CARBO series of meetings. Besides, with the sincere support of our visionary colleagues from the industry, ACCT(I) honours successful chemists, biologists and technologists working in the area of glycoscience in India in attempting to promote research work in this area.

The discoveries leading to the identification of a wide range of roles for carbohydrates, in addition to the traditionally recognized roles (of carbohydrate polymers such as starch and glycogen) as the source of energy and (cellulose and collagen) as structural materials, have led to intense work in the area of chemistry and biology of carbohydrates. Indeed, this has led to making great strides in expanding significantly the non-food uses of carbohydrates beyond the traditional areas of their application in the textile, paper, coating, oil well drilling, etc into those of production of value added bulk chemicals, drug/vaccine candidates, drug delivery materials, diagnostics, superabsorbents, detoxifiers, etc. This year's Meeting is particularly significant in that it is the second in the CARBO series of meetings that ACCT(I) has been organizing as its international meetings, with the first in the series having had held in Dehra Dun in January 2014. Therefore we are extremely delighted to welcome all our distinguished speakers and other participants from India and abroad to this Meeting and thank them from the bottom of our heart in helping us with their most valuable support. In line with the theme of this conference, you will thus be able to listen to the experts themselves on the various aspects of recent trends in carbohydrate research. You will see that not only that this area of research hold great future potential but also that it shall govern a significant part of future chemical and biological research. The future must witness moving work usually being carried out in chemical laboratories into getting them done in plants and microbes and shall be the right thing to do if we were to preserve the sanctity of mother Nature, thereby securing safe and healthy life for future generations. Ray (Raymond) Lemieux may have missed out on the Nobel Prize but future Nobel Prizes may belong to Carbohydrate Chemists! I wholeheartedly congratulate Professor Ashok Kumar and his team on successfully bringing CARBO-XXXI (International) to Delhi University Campus. Have a very useful deliberation and an enjoyable stay.

Prof. K P R Kartha
(President ACCT(I))

Invitation to CARBO XXXII
"Emerging Chemistry and Biology of Carbohydrates (ECBC-2017)"

Students, academicians, researchers and industrialists, engaged in researc -h on all aspects of carbohydrates are cordially invited to actively participate in the "Emerging Chemistry and Biology of Carbohydrates (ECBC-2017)" National Conference (CARBO-XXXII) jointly organized by the Department of Chemistry, Indian Institute of Technology Kharagpur (IIT Kgp) and the Association of Carbohydrate Chemists and Technologists, India (ACCT(I)) to be held at Indian Institute of Technology, Kharagpur from December 18-20, 2017.

The objective of organizing this conference is to explore frontiers of scientific and technological development in the area of Chemistry and Biology of Carbohydrates by bringing world renowned experts working on different aspects of carbohydrates on one platform Carbohydrate Conference.

Thematic areas of the conference includes:

(I) Synthesis and synthetic applications of carbohydrates; (ii) Glycobiology including carbohydrate active enzymes; (iii) Carbohydrates as renewable resources; (iv) Carbohydrate structure and analytical tools; (v) Plant and microbial polysaccharides and glycoconjugates; (vi) Nucleic acids; (vii) Carbohydrate-based medicine, food and nutraceuticals; (viii) Carbohydrate bioprocessing; (ix) Industrial applications of carbohydrates

For details about the conference, please contact the organizing secretary:

Prof. Tanmaya Pathak, Department of Chemistry, Indian Institute of Technology Kharagpur, Kharagpur-721 302, WB, India. Email: ecbc_2017@chem.iitkgp.ernet.in; tpathak@chem.iitkgp.ernet.in

Phone: +91-3222-282242; Mobile: +91-9434715239

Details about the conference will also be available on the websites: www. accti.in or www.chemistry.iitkgp.ac.in/~ecbc/

Some representative contributions in the area of Carbohydrate chemistry: From the Editor desk...

The Xin-Shan Ye group[1] received a track record in the carbohydrate chemistry by synthesizing the huge glycan, mycobacterial arabinogalactan. Usually carbo -hydrate chemists synthesize glycans of size ~30-40. Mycobacterial arabinogalactan contains 92 sugar units and is an essential cell-wall component in *Mycobacterium tuberculosis*. The synthesis was achieved by the preactivation-based one-pot glycosylation protocol. Several linear and branched oligo-/poly-saccharide fragments ranging from 5- to 31-mer in length were constructed in one-pot manner, which enables the total synthesis of a biologically important mycobacterial arabinogalactan through a highly convergent [31+31+30] coupling reaction.

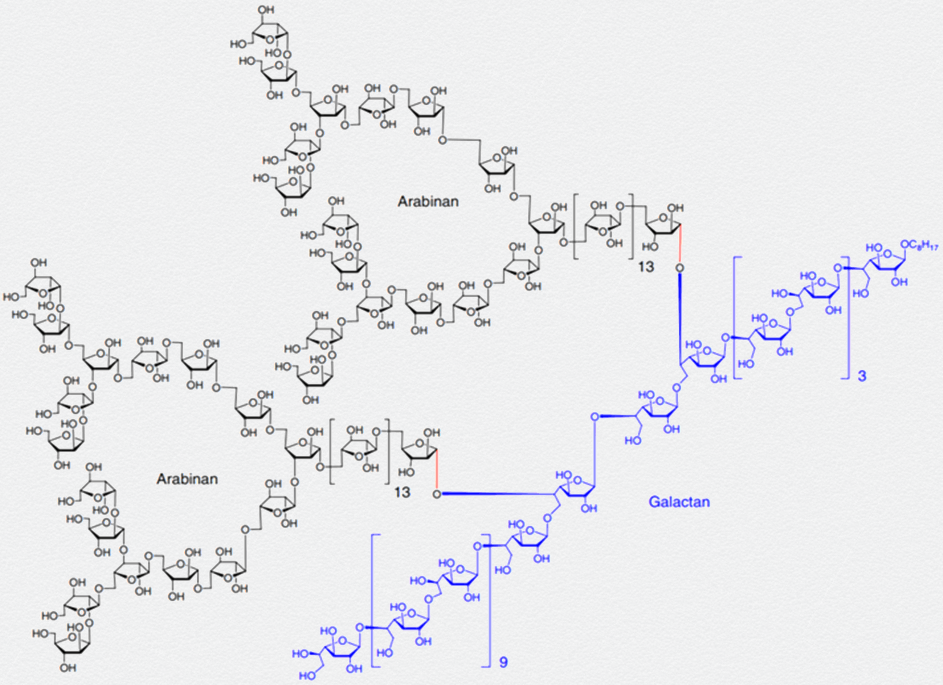

Figure 1. Structure of mycobacterial arabinogalactan containing 92 sugar units.

Each one of us has1.5-2.0 Kg of bacteria living in and on our body! Our immune system has to filter out the good, and then deal with the pathogenic bacteria. When a beneficial bacterium is identified as harmful, the attack by immune system can trigger chronic inflammatory diseases. This misidentification event can now be visualized by the research work of Professor Grimes at the University of Delaware. Bacterial cells are surrounded and protected by peptidoglycan (PG) which consists *N*-acetyl-muramic acid (NAM). The authors synthesized and incorporated modifiable NAM carbohydrate derivatives into the backbone of Gram-positive and Gram-negative bacterial PG. Thereafter, cells were labelled via click chemistry and visualized using super-resolution microscopy, revealing higher resolution PG structural details and allowing the cell wall biosynthesis, as well as its destruction in immune cells, to be tracked.

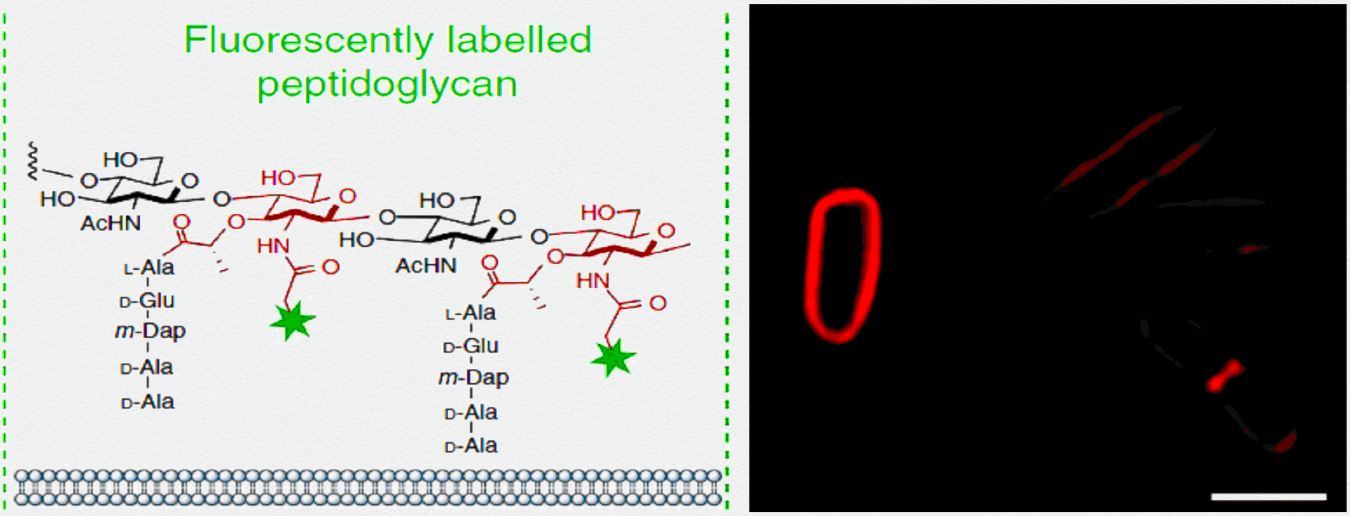

Figure 2. Metabolic labelling of carbohydrate core in bacterial peptidoglycan

Trehalose-6-phosphate (T6P) serves as a central sugar signal in plants, regulates sucrose use and allocation, underpinning crop growth and development. Professor Ben Devis group at the University of Oxford has developed plant-permeable analogues of trehalose-6-phosphate (T6P) that substantially enhance the performance of plants. The developed strategy is able to increase both crop yield and resilience without any genetic modification.

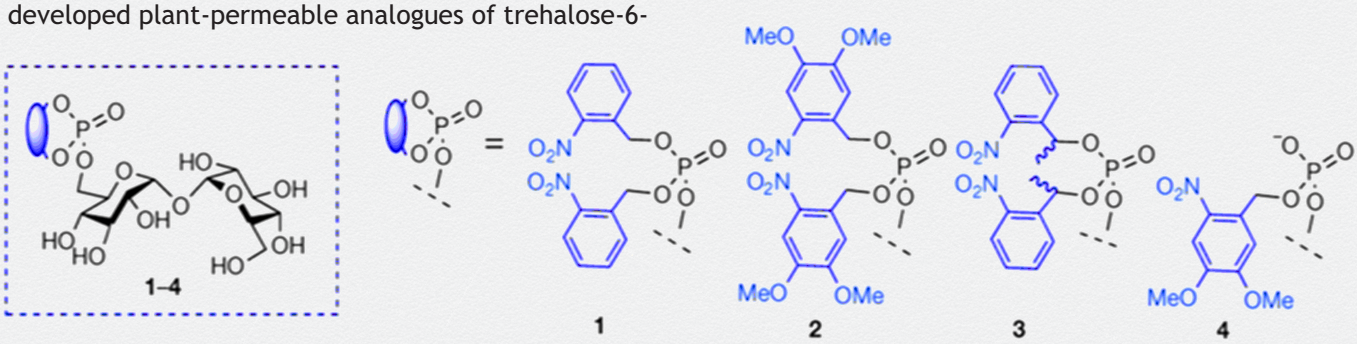

Figure 3. Signalling precursors of T6P

Even after 20 years of the first FDA approved antisense oligonucleotide (ASO) drug, the delivery of therapeutic oligonucleotides remains very challenging. Interestingly, the oligonucleo-tides that are covalently linked to *N*-acetylgalactosamine (GalNAc)based ligands have shown high liver uptake (Figure 4). Prakash *et al* have compared different GalNAc designs, linker as well as the site of conjugation to ASOs in detail. The studied GalNAc-ASO conjugates

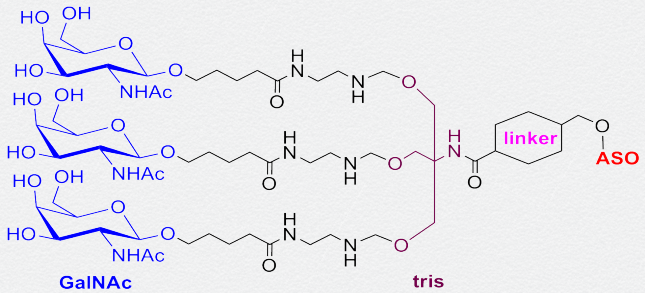

Figure 4. GalNAc-antisense oligonucleotide (ASO) conjugate

exhibited excellent potencies (ED50 0.5-2 mg/kg) for reducing the targeted mRNAs and proteins. The oligonucleotide therapeutics based companies such as Alnylam and Ionis have a healthy clinical pipeline of GalNAc-conjugated siRNAs and ASOs, respectively.

Locked nucleic acid or Bridged nucleic acid (LNA or BNA, Figure 5) is the most popular nucleic acid modification which demonstrates very high binding affinity for complementary targets.

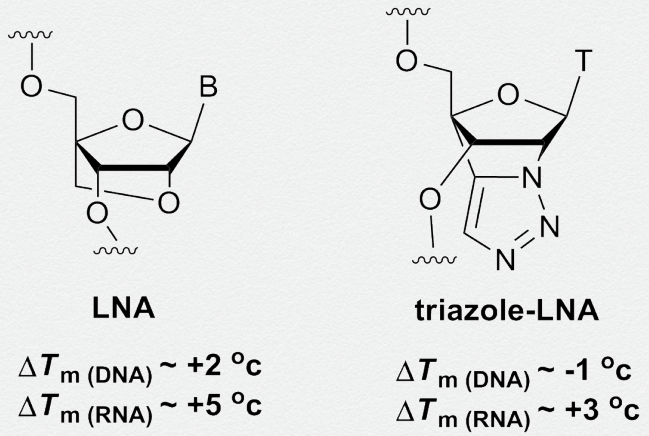

Figure 5. Locked nucleic acid (LNA) and triazole-bridged LNA

Professor Satoshi Obika who was the lead author in the early reports on LNA is committed to further improve the properties of this modification. In the recent efforts, the Obika group have synthesized triazole-bridged nucleic acid (Figure 5) where the triazole insertion between 2′-oxygen and 4′-carbon retains the high RNA-binding selectivity of LNA. The triazole-bridged nucleic acid exhibit excellent nuclease stability and liver bio-distribution compared to parent LNA.

The introduction of chemical modifications to nucleic acids is extremely difficult task. However, mild and biorthogonal conditions of the Cu(I)-catalyzed alkyne-azide cycloaddition (CuAAC) allows easy access to triazole-linked nucleic acid. The trizole linkage has several distinct advantages over natural phospho-diester linkage but exhibit poor binding affinity for the complementary targets. Sharma et al have synthesized and studied the biological and biophysical properties of triazole-linked ribo and xylo locked nucleic acid (LNA). Antisense oligonucleotides (ASOs) and siRNAs containing these triazole dimers were highly active and also nuclease resistant.

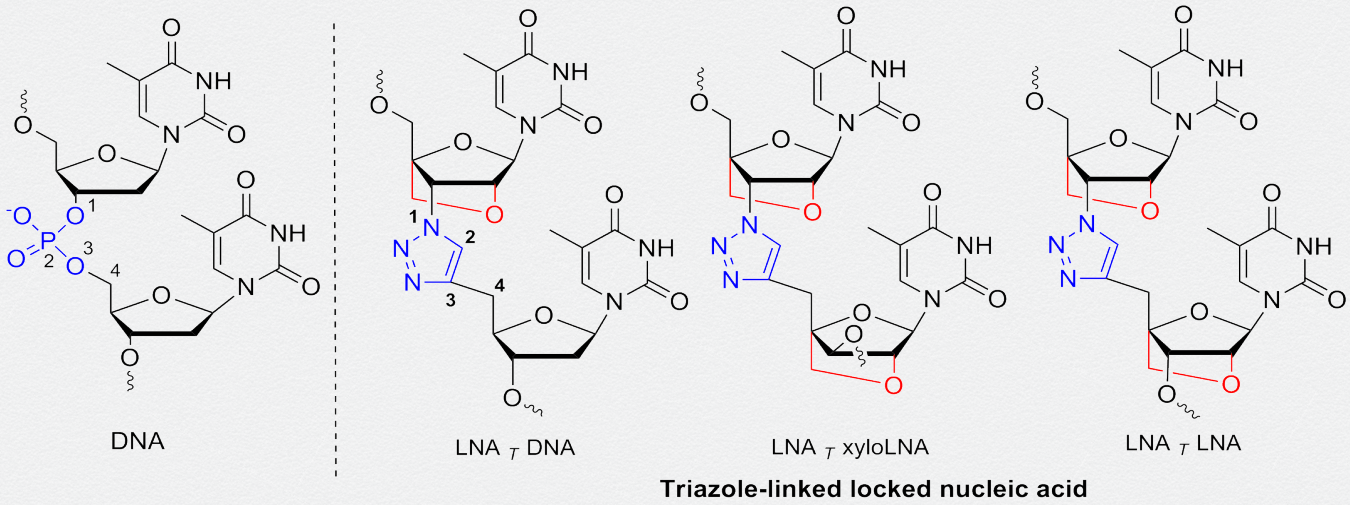

Figure 6. Triazole-linked locked nucleic acid.

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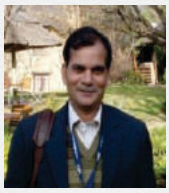
Life Time Achievement Award - 2016

The Association of Carbohydrate Chemists and Technologists of India ACCT(I) is privileged to honor the most successful chemists, biologists and technologists in the country who are working in the field of Glycoscience by giving them Life Time Achievement Award comprising of a Plaque, Citation, Shawl and Cash award of Rs. 50,000 from Lucid Colloid Group, Mumbai annually. Recently, **Dr Bharat Joshi** (now Late) and **Prof. (Dr) Rama P. Tripathi** were conferred ACCT(I)-Life Time Achievement Award for the year 2016 at CARBO XXXI held at Delhi University on November 14-16, 2016, for his contribution to Glycoscience. We express our heartiest congratulations to Dr Joshi and Prof. (Dr) Tripathi.

Dr Bharat Joshi was one of the very rare and the finest blend of super rich experience of 39 years of Technology, Business, Management, R&D, Worldwide Customer Development & Relations, Knowing and interacting with all major Natural Polymers Producers- WORLD WIDE, Patent Filing, Administration, Legal, Commercial in the field of Natural Polymers & Derivatives. He hold President & Managing Director, Industrial Guar Products Pvt. Limited, Ahmedabad -Neemrana (A company of PfP LLC, USA) and Executive Director - Encore Natural Polymers Private Limited; Director - Industrial Utilities Private Limited; Director - Encore GRC Private Limited; Director - Halcyon Labs Private Limited; Director - Encore Poly frac Pvt Limited.



Prof. (Dr) Tripathi has worked as Chief Scientist and Professor AcSIR New Delhi at Medicinal & Process Chemistry Division, Central Drug Research Institute, Lucknow, India. After his MSc (1979) from DDU Gorakhpur University he completed M.Phil (1982) and PhD (1985) from Delhi University. He visited University of Rennes, Rennes, France under INSA Exchange Programme (2006), and Pretoria, South Africa through ICS-UNIDO Programme (2010). Dr. Tripathi is a member of numerous scientific bodies and editorial board of several journals. He has contributed over 140 publications (citations > 4000, and h-index 32) and secured 20 patents in the area of Infectious diseases. Recently, he received two awards "Certificate of Excellence 2013 in Reviewing Eur. J. Med. Chem." and "Certificate of Excellence 2014 in Reviewing Tetrahedron, as recognition of outstanding contribution for the quality of the journals by Elsevier, a world-leading publisher in the area of science, health, and technology, for his outstanding contribution excellence in reviewing 'Tetrahedron', and EJMC.

ACCT(I) Carbohydrate Excellence Award-2016

Prof. Narpinder Singh, is Professor and Coordinator of UGC-SAP, University-Industry linkage Programme, and president, Association of Food Scientists and Technologists, India (AFSTI). He is Fellow of the National Academy of Sciences, India (NASI)-2011; Fellow of INSA-2010; Fellow of the National Academy of Agricultural Sciences (NAAS)-2005; and Fellow Association of Food Scientists and Technologist (AFSTI)-2012. He completed over 18 major research projects and contributed over 200 publications, 22 reviews, and one book (h-index: 44, Citations: > 6300). We express our heartiest congratulations to him.

7th C. G. Merchant Memorial Lecture - 2016

Prof. Bishnu Pada Chatterjee, Emeritus Professor, Dept of Natural Sciences, West Bengal University of Techn-ology & Sir Asutosh Mookerjee Fellow, ISCA, IACS, Jadavpur, Kolkata. Prof. Chatterjee received Ph.D from the University of Calcutta in 1973. Studied lectin-carbohydrate interactions in Gerhard Uhlenbr-uck's laboratory in Medical University and Clinic, Cologne, Germany (1976-1978). In 1990, Professor of Biological Chemistry, Indian Association for the Cultivation of Science, Calcutta, Chairman (1997-2000), and Senior Professor (2006-2007). During 28 years, he developed a lectin school that produced 15 PhD in the field of lectin-carbohydrate interaction which culminated to initiate research on glycobiology. He received Life-time Achievement Award from ACCT(I) and Life-time Achievement Education Award from Health Education Development Association, New Delhi. As DAAD Fellow he visited Max-Planck Institute for Immunobiology, Friburg, Medical University and Clinic, Cologn. We express our heartiest congratulations to him.

1st Prof. M P Khare Memorial Lecture Award-2016

Prof Naveen K. Khare become full Professor in Chemistry since 2006 at University of Lucknow. He did his PDF at York University, Toronto (1986-1988) and also worked as Research Associate at York University, Toronto (1991-1993). He was selected as visiting Scientist at Southern Research Institute, USA (1999-2002). His research area consists, synthetic carbohydrate chemistry related to bacterial polysaccharides and natural product chemistry related to oligosaccharides and their glycosides. Prof Khare published 74 research papers in reputed journals. He also wrote a book chapter: vol. 9, 61, 1997. ED: L. Echmeister, edited by W. Hertz, G.W. Kirby, R.E. Moore, W. Steglich & Ch. Tamm. Published by New York (springer verlag). Prof. Khare guided 14 Ph.D. students and 2 M.Phil. students. Prof Khare also helped in writing monograph "COMPENDIUM OF INDIAN MED. PLANTS" vol.1, 1990 of publication & information directorate, New Delhi. Worked as Director, Development & Planning Board, University of Lucknow, 2012-13. Director, Admission 2013, University of Lucknow, Lucknow. Vice President, ACCT(I) since 2013. Ex Secretary and Joint Secretary of ACCT(I). Editor, CNL published by ACCT(I), 2007-2011. Prof Khare got the Best Teacher Award by the Chemical Research Society of India (CRSI), IISc, Bangalore on July 21, 2012. Got cash award for best paper entitled "Stereoselective synthesis of di and trisaccharide fragment related to the O-polysaccharide of A. xylinum as artificial antigen" in "International Symposium on Drug Development" held at C.D.R.I., Lucknow, 1994. Best Teacher's Award-2015 by Awadhnama Educational and Charitable Trust, was given by Mr. Abhishekh Mishra, Minister of State Attached to Hon'ble Chief Minister, U.P. on Teacher's Day (Sept. 5, 2015). Best poster award (2015) entitles "Synthesis of oligosaccharide fragments related to E.Coli strains" in National Convention of Chemistry Teachers, 2015 held at Lucknow University, Oct. 8-10, 2015. He is also working as Director, IGNOU Study Center, Lucknow University, Lucknow since July 2016. We express our heartiest congratulations to him.

9th Dr H. C. Srivastava Memorial Lecture - 2016

Dr H. C. Srivastava Memorial Lecture was given by the eminent Carbohydrate scientist and the speaker is honored with citation and a cash award of Rs. 20,000.00 by the Association. The 9th Dr. H.C. Srivastava Memorial Lecture is given by **Dr Suvarn Kulkarni**, at XXXI Carbohydrate Conference held at Delhi University on 14-16 December 2016. We express our heartiest congratulations to him. Dr Kulkarni did his Ph. D. in Chemistry, from University of Pune in 2001. He was Academia Sinica Post-doctoral Fellow at Taiwan (2001-2005), Assistant Specialist - University of California Davis (2005-2008), He become Assistant Professor at Indian Association for the Cultivation of Science (2008-2009), Assistant Professor-Indian Institute of Technology Bombay (2009-2012), Associate Professor at Indian Institute of Technology Bombay (2012- till date). Dr Kulkarni published more than 49 research articles in journal of high repute. He wrote book chapters, and have patents also. His research interest includes; One-pot methods for glycomics. Synthesis of cell-surface carbohydrates oligosaccharides, glycolipids and glycoconjugates.

Award for the 'Best Paper Published in TCR' 2016

Dr Cláudia Pereira Passos did her PhD under the supervision of Prof. Manuel A. Coimbra at *QOPNA, Departamento de Química, Universidade de Aveiro,* Portugal. Currently she is working as Researcher at *QOPNA, Department of Chemistry, University of Aveiro,* Portugal. Her research interest focus on Immunostimulatory properties of coffee mannans, arabinogalactan-protein and Microwave superheated water extraction of polysaccharides from spent coffee grounds. Her research was supported by a post-doc grant by FCT (SFRH/BDP/65718/2009). In her own word: "*My participation in the conference "International Conference on Challenges in Chemistry and Biology of Carbohydrates" In India this year allowed me to meet a high quality level of scientific work that is being done by the young scientific community, in countries such as India that have at the same time a complete different style of life from the European. Furthermore, the honor I was given by the industrial partners of the congress evidence to me that we are moving towards a global and interdisciplinary approach on hydrocolloids research.*" We express our heartiest congratulations to her.

ACCT(I) Best Thesis Award-2016

Dr Shuchi Singh has received her PhD from Center for Energy, Indian Institute of Technology (IIT) Guwahati in the year 2015. She is currently working as an SERB-National Postdoctoral Fellow in the Department of Chemical Engineering, IIT Kanpur. Her principle research interests are lignocellulosic biofuels production and intensification of the processes involved. She has published 13 articles in international journals of high repute such as Applied Energy, Bioresource Technology, Industrial & Engineering Chemistry Research, Ultrasonics Sonochemistry etc., and 2 book chapters.

She was awarded with ACCT(I) Best Thesis Award-2015 and she delivered her award lecture on the title "Bioethanol production from Parthenium hysterophorus involving cellulase from Bacillus amyloliquefaciens SS35: Process development, optimization and intensification" during CARBO-XXXI at University of Delhi, New Delhi.

Retirenment of Mr. N C Dhuldhoya

Mr. Nikunj C Dhuldhoya (born on 12th November, 1948) holds Ex-President (Quality Assurance & Research and development) having rich experie-nce of about 45 Years in Indian Gum Industries and Lucid colloids Ltd, was involved for the manufacturing of Guar gum and other Hydrocolloids. He successfully developed following products:

(i) Carboxy methyl derivatives of Guar, starch and TKP.

(ii) Carboxymethyl-hydroxyalkyl guar for oil and gas industry.

(iii) Hydroxypropyl trimethyl ammonium chloride derivative of guar for cosmetic industry.

(iv) Hydroxyalkyl derivative of guar and tamarind.

(v) Very high and fast hydrating Guar mainly for oil and gas industry.

He did his M.Sc. from UDCT- BUDCT – UICT – ICT and guided for high quality and hygiene standards of partially hydrolysed Guar Gum manufactured at Taiyo-Lucid and also working as a technical coordinator of Lucid colloids, sponsored projects with UICT Mumbai, Kundnani College of Pharmacy, Mumbai and L.A.D college of Cosmetology, Nagpur. Under his dynamic leadership, Lucid Colloids Ltd has achieved following certificates: HACCP; ISO 9001:2008; ISO 14001:2004; ISO 22000:2005; whereas TLPL has obtained following certificates: ISO 9001:2008; ISO 14001:2004; ISO 22000:2005; FSSC 22000:2011; OHSAS 18001:2007 SDX.

Mr. DHULDHOYA was awarded with ACCT(I) Life time achievement Award-2007 and Fellow-ACCT(I) in 2011. After his dedicated 45 years of service, he retired from Lucid colloids Ltd on 30th Nov. 2017. We wish to pass our gratitude for his continued support to our association.

OBITUARY

The ACCT (I) deeply mourns the sad and untimely demise of Dr. Bharat Joshi (IGP, Ahmedabad). He always gave his utmost to the Association and helped in making it a great platform for bringing together all researchers of the carbohydrate field. His immense contributions to the field of carbohydrates shall always guide us and show us the way towards excellence in carbohydrate research & development. The executive body and the members of ACCT(I) pray to the almighty that his soul rests in peace and the members of his family have the strength and courage to bear this immense loss.

ACCT(I) has lost a quite capable and knowledgeable person in the field of carbohydrate chemistry. We had lot of hopes on him in the future events of the Association.

P. L. Soni/ A. K. Sen

The news of the untimely demise of Dr. Joshi is indeed shocking. I pray almighty for his soul to rest in peace and also to give enough strength to the bereaved family to sustain from this great loss.

K. P. R. Kartha/ Ashok Prasad

Oh, it is extremely sad news. We had great memories with Dr Joshi and remember his noble character. I pray almighty for his soul to rest in peace and his family to have great strength to overcome this loss.

Uday Merchant/ Sanjay Modi/ Brij Sharma

Dr Joshi was a very cooperative & intelligent industrialist and will always be remembered by all specially by ACCT(I). May god give his family the strength to overcome this huge loss.

Naveen Khare/ R.P. Tripathi

Dr. Joshi was really a nice person. We Editor and Associate editor pray almighty for his soul to rest in peace and also to give enough strength to the his family to sustain from this immense loss.

V. K. Tiwari/ Arya Ajay

MINUTES OF THE ANNUAL GENERAL BODY MEETING – 2016 HELD ON 14.11.2016 and EC MEETINGS held on 27.09.2017 at Delhi University, Delhi

The Annual General Body meeting of the Association of Carbohydrate Chemists and Technologists (India) was held at University of Delhi at 6.30 PM on 14/11/2016 at the conference venue, 2nd International Carbohydrate Conference CARBO-XXXI. A total of fifty seven members of the Association and over fifty non-member-delegates attended the meeting along with the participants and guests attending the XXXIst ACCT(I) Carbohydrate Conference organized by University of Delhi. President, ACCT(I), Prof K P R Kartha gave the introductory speech, and Prof Ashok Prasad, Secretary, ACCT(I) presented the welcome address to the delegates and requested Dr Vinod K Tiwari, Joint Secretary, ACCT(I) to read out the minutes of the previous GBM held on 29.12.2015 during CARBO-XXX organized by Pondicherry University. The minutes were accepted unanimously after it was proposed by Dr P L Soni and seconded by Prof N. K. Khare. Prof Ashok Prasad then described the previous years' activities of the Association and the agenda finalized by the Executive Committee (EC) at its meeting on the 1st Day of XXX Carbohydrate conference at Pondicherry.

Dr Amit Bhatt, Treasurer presented the audited 'Statement of Accounts' of ACCT(I), which after a brief discussion, accepted by the members unanimously. It was proposed by Dr P L Soni and was seconded by Dr R P Tripathi. Following this, Dr Vinod Tiwari, Editor, Carbohydrate News Letter (CNL) placed the 'Statement of Accounts' of CNL (Issue 17) before the GB. Proposed by Prof Ashok Kumar and seconded by (Late) Dr Bharat Joshi, it was accepted unanimously by the GB. The CNL is currently being published annually on a 'no loss no gain' basis. The publication cost of the CNL is currently met with support from ACCT(I) and from the advertisements from IGP, Lucid Colloids, and Sunita Hydrocolloids Pvt. Ltd.

Subsequently, Dr A K Sen was nominated as the Chairman of committee for constituting a 'Constitution and Bye-law Subcommittee' discussed his effort to achieve the goals of the constitution of the committee. The proposal for having a 'Carbohydrate Chemistry Chair' was constituted and briefly discussed and was then decided that the by Dr A J Varma may take a lead after the preparation of a proposal for meeting the financial commitments in its regard.

Members also expressed their view that an appropriate collaboration between the participants from academia and industries in the CARBOs has possibly inadequate. Prof G S Chauhan, Dr A K Sen and Dr Vasudeva Singh were given the responsibility to explore the possibilities for increasing the membership from industrial houses and to invite new people from Industry to the ambit of future CARBOs. It was expected that they will come up with an action plan in about three more months.

Members expressed their profound sense of appreciation to Prof Ashok K Prasad, his team and the Delhi University for the wonderful arrangement made for CARBO-XXXI.

Prof Tanmay Pathak then gladly accepted his willingness to be the Organizing Secretary of CARBO-XXXII and to host it at the Department of Chemistry, Indian Institute of Technology (IIT), Kharagpur. House sincerely expressed their deep gratitude to Prof T Pathak for the same. With a view to bringing greater visibility to the activities of association, ACCT(I) executives and Organizing Secretary, Carbo-XXXII Prof T Pathak shall make efforts to bring together about 20 renowned scientists from India and abroad from academia and industry at the CARBO-XXXII. EC shall discuss and recommend the names of accomplished scientists and technologists to be honored as the Fellow of ACCT(I) at CARBO-XXXII to be held in Kharagpur.

It was decided that any change of address of the life members (ACCT(I)) should be posted on the ACCT(I) website. All life members were then requested to ensure that any change of address will be communicated to the website administrator promptly so that the ACCT(I) website stays updated in this regard. A brief discussion on the proposal for forming ACCT(I) local chapters was decided to be considered once the organization has grown enough in its membership size. However, invited talks or brain storming sessions involving ACCT(I) members as hosts/speakers/ invitees/or the like and students & researchers from academia/industry was encouraged to be considered for ACCT(I) activities locally. For locating possible hosts outside India, countries such as Taiwan, China, Malaysia, South Korea, etc could be considered.

Proposal for the institution of a new award to go to a young carbohydrate researcher in the name and honor of late Prof A K Mukherjee, house asked Dr A K Sen to inform Mrs Mukherjee to increase the donation amount ≥ Rs 200000.00 to make the award operational in a sustainable manner. Furthermore, in view of the sponsorship obtained from Prof Anakshi Khare a new award by ACCT(I) called, Prof M P Khare Memorial Lecture Award was implemented from CARBO-XXXI in Delhi.

The GB congratulated Dr R P Tripathi and (Late) Dr Bharat Joshi for receiving the Life Time Achievement Award jointly for the year 2016 and Prof N P Singh and Dr. Claudia Passoss for the 5th Excellence in Carbohydrate Research award-2016 and the seventh e-TCR award, respectively. The GB then congratulated Prof. N Khare, Prof B. P. Chatterjee and Dr Suvarn Kulkarni for delivering the first Prof M P Khare Award Lecture, seventh Mr. C. G. Merchant Memorial Lecture and the Dr H C Srivastava Young Scientist Award Lecture, respectively. ACCT(I) congratulated Dr Shuchi Singh, winner of "ACCT(I) Best Ph.D. Thesis Award-2016 with a citation and a cash of Rs 10000.00 sponsored by Lucid Colloids Ltd. in recognition of the best doctoral research work carried out in the area of glycosciences in India.

ACCT(I) members and delegates greatly appreciated Prof

Ashok Prasad, Organizing Secretary, CARBO-XXXI for the excellent arrangement during CARBO-XXX. The GBM lasted for nearly two hours and was concluded with a vote of thanks to the chair by Prof Prasad and Dr V K Tiwari.

Minutes of the EC Meeting held at Delhi University on 27-09-2017

The meeting was held at the International Guest House, DU, Delhi in the meeting room under the chairman of Prof K P R Kartha, President, ACCT(I). Twelve of the nineteen EC members of the Association along with five co-opted members from the Faculty of Chemistry, DU were present. The meeting lasted for approximately three hours. Various points concerning the organization of the Carbohydrate Conference, ACCT(I) awards-2017, and CARBO-XXXII to be held in IIT Kharagpur was discussed. Prof Ashok K Prasad briefed the EC with the updates on the organization of the event. As emerged from the meeting, efforts will be made in order to bring several distinguished researchers working on different aspects of carbohydrate chemistry worldwide.

A discussion was also held on necessitate to attract some good contributions for the e-TCR from abroad besides those being received now. Dr P L Soni, Editor-in-Chief, e-TCR recalled that the existing Editorial Board members have completed nine years of their excellent service to the cause of the Journal and thus a new team could now be constituted to look after the editorial work, which was constituted and shortly the e-TCR website shall be updated accordingly.

The EC meeting was concluded with a vote of thanks to the chair by Prof Ashok Prasad.

Prof. Ashok K. Prasad
(Secretary, ACCT(I))

Report of the 31st Carbohydrate Conference (CARBO-XXXI)

The CARBO-XXXI Conference was the 2nd International Conference of the Association of Carbohydrate Chemists and Technologists India (ACCT(I)) organized by Professor Ashok K Prasad and his team at the Department of Chemistry, University of Delhi on 14-16 November 2016. The theme for CARBO-XXXI International Conference was "New Frontiers in Carbohydrate Chemistry and Biology".

The carbohydrates are information rich molecules vital to recognition process in biological system and errors in glycosylation of biomolecules in cell system have severe implications that may lead to disorders, such as cancer, diabetes, etc. This implies that there is a tremendous potential for the development of carbohydrate based therapeutics or drugs to combat various diseases. Furthermore, carbohydrates are multifunctional complex molecules that need special attention for their transformations to useful compounds / materials. We have gathered much of what we have today about carbohydrate functions from studies involving methods of organic & analytical chemistry, structural biology, biochemistry, genetics and cell biology. In spite of this, momentum is building on chemists to do for carbohydrates what biologists have done for genomics and proteomics. Thus, the objective of organizing this conference was to explore frontiers of scientific and technological development in the area by bringing experts working on different aspects of carbohydrates on one platform.

The International Conference was attended by speakers / participants from eleven countries including India and the total number of participants were more than four hundred. Following thematic areas were covered in ten different technical session and two poster session:

1. Carbohydrates as a Source of Bio-fuels
2. Carbohydrates from Medicinal Plants
3. Carbohydrates in Synthesis of Useful Complex Compounds
4. Carbohydrate Based Biopolymers: Modifications and Applications
5. Glycobiology
6. Nucleic Acid Chemistry
7. Industrial Carbohydrate Chemistry
8. Structural Carbohydrate Chemistry
9. Neutraceuticals and Complex Carbohydrates

The Conference started at 9.00 am on 14th November 2017 with Professor JP Khurana (PVC University of Delhi), Professor DK Sinha (Dean of Colleges University of Delhi), Dr PL Soni (Chief Advisor ACCT(I)) and Professor KPR Kartha (President ACCT(I)) on dais along with other dignitaries. All ten technical sessions were chaired by eminent scientists either from the Science Departments of University of Delhi or from other parts of the country. The technical sessions were divided based on the sub-themes of the conference and were started with a plenary talk by world renowned scientists of the area. Hundred and twenty posters were presented in two poster sessions on 14th and 15th November 2016 in the conference by young researchers and faculty members, which were evaluated by a panel of judges. Three best posters selected on the basis of evaluation were awarded with a certificate and cash prize in the valedictory session of the conference. The three best poster awardees are Ms Smriti Srivastava (University of Delhi), Mr Someswara Rao (IIT Bombay) and Ms Shipra Nagar (FRI Dehradun). The valedictory session of the conference ended at 7.30 pm of 16th November 2016. Overall, the conference was highly successful.

Prof. Ashok K. Prasad
(Organizing Secretary)

Report on ACCT(I) Satellite Conference on 'Recent Trends in Carbohydrate Chemistry (RTCC-2016)'during November 12, 2016

First of all, on behalf of the organizing committee, Recent Trends in Carbohydrate Chemistry (RTCC-2016) and on my own behalf, I extend my sincere thanks to ACCT(I), DST, and BHU for the support which greatly helped me to organized this Carbo event in the Department of Chemistry, Institute of Science, Banaras Hindu University, Varanasi-221005, India on 12th November, 2016. This conference was organized on the occasion of Centenary Year Celebration of Banaras Hindu University (1916-2016).

Carbohydrate moiety has a long history of biological and chemical significance. The role of carbohydrates in several vital biological processes make this class of molecules a considerable and promising scaffold for the development of pharmacologically interesting scaffolds. Exclusive structural features of carbohydrates to form diverse linkages, branching patterns and substitutions, has attracted generations of chemists to explore carbohydrate chemistry which has been further accelerated by progressive researches made in the field of glycochemistry/ glycobiology. This field is ever increasing in glycopolymer, glycopeptides, glyconanostructures, supramolecular assembly, and other very important streams. The symposium was aimed to promote discussion and an exchange of experiences and information related to carbohydrate chemistry, particularly focusing the recent developments made in this field and its future perspectives. The symposium was useful for academicians, technologists and researchers as well as R&D of modern Pharma, polymer, glyco and textile industry. Thus, looking forward to the importance of carbohydrate chemistry in day to day life, the main theme was based on recent trends in chemistry and biology of carbohydrate and its applications. The following topics were covered during the three technical session of RTCC-2016:

(i) Plants and Microbial Polysaccharides: Isolation, Structure, Function and Analysis

(ii) Common Glycosidation methodology

(iii) Starch, Cellulose, Gums and other Industrial Polysaccharides

(iv) Glycobiology and Glycomics

(v) Glycotechnology

(vi) Carbohydrates - based drugs

(vii) Chemical modification of carbohydrates

(viii) Carbohydrates in Chiral Synthesis

(ix) Advances in Application of Carbohydrates

(x) Chemoenzymatic synthesis of Complex Carbohydrates including Sialic Acid

At the inaugural session, nearly 300 delegates including science faculty members from our department, local colleges, scientists from different institution of India and abroad had attended the function. Function began with BHU Kulgeet Madhur Monohar … Prof. Richard R Schmidt, Universitat Konstanz, Germany was the Chief Guest of the function and we really thanked him to accept our invitation. Prof. Schmidt nicely addressed the gathering and graces the occasion. Prof. B Singh, Director, Institute of Science, BHU had given the brief information about Institute of Science, BHU and Prof. R A Singh, Head Department of Chemistry presented the glorious overview of chemistry department. Dr K P R Kartha had given the brief report of the activities of ACCT(I) and Dr P L Soni, Chief Advisor ACCT(I) presented Inaugural lecture on "Technology Development to Alleviate Exploitation of Forest Trees". Myself Vinod K Tiwari, Organizing secretary, RTCC-2016 presented vote of thank.

After tea, Key note lecture was delivered by Prof. Richard R Schmidt, Universitat Konstanz, Germany on the topic 'Glycoside Bond Formation: Can Chemists Learn from Nature ?', which was followed by two plenary lectures delivered by distinguished scientist including Prof. Xi Chen (UC Davis, USA) on title 'One-Pot Multienzyme synthesis of Sialylated Glycans and their applications', and Prof. Christophe Len (Université, Compiegne, FRANCE) discussed his finding on 'Green chemical synthesis around furfural'. After Lunch, the second technical session started, where Prof. Roland J Peters (The Netherlands) presented 3rd Plenary lecture on 'Carbohydrate-Protein Interaction' followed by 4th Plenary lecture by Prof. V S Prmar (Delhi, India), who discussed on "Biocatalytic Synthesis of Modified Sugars for Construction of Oligonucleotides of Pharmaceutical Interest". Then after Prof. David Gammon, University of Cape Town, South Africa discussed on 'Highlights of the recent synthetic and medicinal chemistry of mycothiol and its analogues'. Finally, Dr K P R Kartha (NIPER Mohali) talked on 'Application of mechanochemical methods towards complex glycoconjugate synthesis' and Dr Vineet Kumar (FRI Dehradun) on the title 'Plant polysaccharides: structural templates for therapeutic applications'. During poster session, fifty seven contributory poster presentations from students/faculties across the country and abroad were presented. The Poster presentation sessions encouraged the younger researchers for intensive discussions with leading scientists making it a stimulating event. We quite confident that the deliberations made during RTCC-2016 may forward at the innovative areas of Carbohydrate Chemistry would be of great benefit and encouragement.

The conference was very successful in all respect and participants have expressed their great satisfaction in the concluding remarks. In the concluding remarks, Prof. Schmidt, Prof. Xi Chen, Prof. P L Soni, Prof. Kartha and Prof V S Parmar had mentioned that in order to make fruitful academic-industries collaboration carbohydrate based industries should come for the active participation in the forthcoming CARBO conference. Finally, Organizing Secretary expressed his sincere thanks to all the invited speakers from India and abroad and gratefully acknowledges SERB-DST and BHU for all the support and financial assistance to host this event successfully.

Dr Vinod K Tiwari
(Convener, RTCC-2016)

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OPENING CEREMONY OF CARBO XXXI AT DELHI UNIVERSITY

EXECUTIVE COMMITTEE MEETING

Glimpses of RTCC-2016 held at Department of Chemistry, Banaras Hindu University, Varanasi

ACCT(I) National and International Carbohydrate Conferences

26. CARBO-XXVI: CSIR-Indian Institute of Chemical Biology, Kolkata (2011)
27. CARBO-XXVII: CSIR-Central Food Technological Research Institute, Mysore (2012)
28. CARBO-XXVIII: ACCT(I) at Hotel Sunpark Inn, Dehradun (1st International Conference) (2013)
29. CARBO-XXIX: Center of Innovative and Applied Bioprocessing, Mohali (2014)
30. CARBO-XXX: University of Pondicherry, Pondicherry (2015)
31. CARBO XXXI: University of Delhi (2nd international conference) (2016)
32. **CARBO-XXXII: to be held at IIT Kharagpur** **(2017)**
33. CARBO-XXXIII: to be held at..... (2018)

Note: From CARBO-I to CARBO-XXIV please see previous year Carbohydrate News Letter (CNL-2015)

ACCT(I) YOUNG SCIENTIST AWARDS- 2016

To encourage young students, the Association of Carbohydrate Chemists & Technologists (India) gives cash award of Rs. 5000.00 (Rupees Five Thousands only) and a citation for the best oral/poster presentation at the Carbohydrate Conference' every year. Only research scholars, research associates etc. (below the age of 30) are eligible for this award.

At the XXXI[st] Carbohydrate Conference held at Delhi University from November 14-16, 2016, paper entitled "Chemo-Enzymatic Synthesis of Bicyclo Xylotriazolyl Nucleosides" authored by Smriti Srivastava and Ashok K Prasad was selected as the best poster. Another paper entitled "Expedient Route to Access Rare Deoxy Amino L-Sugar Building Blocks for the Assembly of Bacterial Glycoconjugates" authored by Someswara Rao Sanapala and Suvarn S. Kulkarni was also selected as another the best poster. We express our heartiest congratulations to Miss. Smriti Srivastava and Mr. Someswara Rao Sanapala.

Smriti Srivastava completed his MSc from Hansraj college, DU and then joined PhD under the guidance of Prof. Ashok K Prasad. Her area of research is "Click Chemistry Route to Various Modified Nucleosides and their Biological and Photophysical Studies."

Someswara Rao Sanapala is working as Research Fellow under the guidance of Prof. Suvarn S. Kulkarni at Department of Chemistry, IIT Mumbai, Mumbai.

LUCID COLLOID AWARD-2016

To encourage research on hydrocolloids, Ms. Lucid Colloids Limited, Mumbai, offers a cash award of Rs. 5000.00 (Rupees five thousand only) and a citation for the best paper presentation on hydrocolloids since 2003. At the XXXI[st] Carbohydrate Conference held at Delhi University from November 14-16, 2016, paper presentation entitled "A Novel Polysaccharide from Tinospora sinensis Containing 3-O-Methyl-Arabinose and 3-O-Methyl-Galactose and Diverse Approaches for Uronic Acid Estimation" by Shipra Nagar, Andreas Hensel, Petra Mischnick and Vineet Kumar (FRI Dehradun), got this award. We express our heartiest congratulation for him.

Dr Shipra Nagar has completed her doctorate from Forest Research Institute, Dehradun under DAAD Sandwich Research Grants in Bi-nationally Supervised Doctoral Degrees, 2014/15 (57052629), wherein she carried out a part of her research work at Institute of Food Chemistry, Technical University, Braunschweig, Germany and Institute of Pharmaceutical Biology and Phytochemistry, WestfälischeWilhelms University, Muenster, Germany for a period of two years. She is a recipient of Gold medal in M.Sc. and other accolades during her Ph.D such as Young Scientist Award, best presentation awards and Ist prizes in oral and poster presentations in numerous National and International conferences and symposiums. She has international publications in peer reviewed journals with high impact factor viz. Carbohydrate polymers, International J. Biological Macromolecules.

THE ABSTRACTS OF YOUNG SCIENTIST AWARDEES AT CARBO XXXI

Chemo-Enzymatic Synthesis of Bicyclo Xylo-Triazolylnucleosides

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The copper(I)-catalyzed Huisgen-Sharpless-Meldal 1,3-dipolar cycloaddition ('click' chemistry) between alkynes and azides resulting in the formation of 1,4-disubstituted 1,2,3-triazoles has gained significant importance because of its wide range of applications in various fields of drug discovery, bioconjugation and

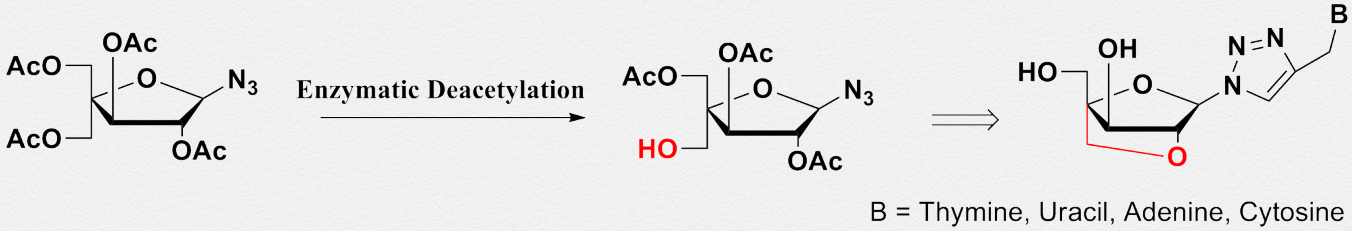

Figure 1: Chemo-enzymatic synthesis of LNA based xylo-triazolyl-nucleosides

material or surface science.[1] We decided to explore the feasibility of the 'click' chemistry for the construction of novel 1,2,3-triazole nucleosides with the modified bicyclo azido sugar and pyrimidine / purine tethers connected via a flexible methylene linker.[2,3]

Synthesis of modified nucleosides is challenging task due to need for selective manipulation of various functionalities present in sugars. Thus chemo-enzymatic synthesis comes into play to increase the selectivity and efficiency of the synthesis process (Fig 1).[4] Azido monomer is synthesized via a chemo-enzymatic synthesis, which was confirmed by spectroscopic techniques. The detailed work will be presented during poster session.

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Expedient Route to Access Rare Deoxy Amino L-Sugar Building Blocks for the Assembly of Bacterial Glycoconjugates

Someswara Rao Sanapala and Suvarn S. Kulkarni*

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Carbohydrate antigens are excellent targets for the development of vaccines and pathogen detection strategies.[1] Bacterial glycoproteins and oligosaccharides play important roles in pathogenesis of serious infectious diseases. They often contain unusual rare deoxy amino L-sugars which are virtually absent in the human cells. An immune response against the cell-surface glycans of bacteria is the basis for the development of new vaccine candidates against bacterial infections.[2] Access to differentially protected rare deoxy L-sugars are highly desired to accelerates the synthesis of bacterial glycans. Recently, we established a protocol for the synthesis of rare deoxy amino D-sugars starting from D-mannose.[3] In this context, we are interested in the synthesis of rare sugars via nucleophilic displacement of triflates of the corresponding L-sugars. Herein, we report an expedient synthesis of thio or p-methoxy phenyl glycosides or L-fucosamine, L-pneumosamine, L-quinovosamine, L-rhamnosamine and other 4-deoxy amino and 2,4-dideoxy amino L-sugars. We extented this methodology to the total synthesis of O-specific polysaccharide (O-PS) biological repeating unit of Yersinia enterocolitica serotype O:50 strain 3229 (1, Fig 1) and the trisaccharide of Pseudomonas chlororaphis subsp. aureofaciens strain M71 (2, Fig 1).[4] Using SN2 displacement of triflates we also accessed all the isomeric 6-deoxy-L-hexoses from cheaply available L-rhamnose.[5]

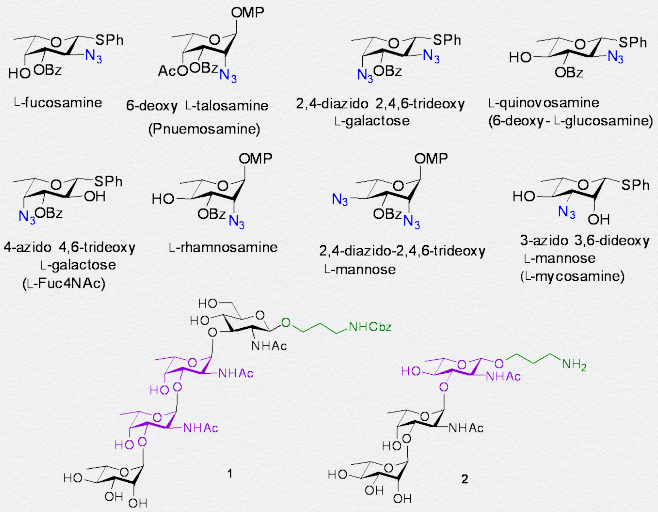

Figure 1: Representative structures of bacterial rare deoxy amino L-sugars and O-PS of Y. enterocolitica 1 and Pseudomonas chlororaphis subsp. aureofaciens strain M71 2

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A Novel Polysaccharide from Tinospora sinensis Containing 3-O-Methyl-Arabinose and 3-O-Methyl-Galactose and Diverse Approaches for Uronic Acid Estimation

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Tinospora sinensis has immense therapeutic significance.[1] After methanolic extraction of the stems, polysaccharides have been isolated from the residue by successive extractions with cold water, hot water and 0.25 M NaOH in 0.98, 0.55 and 0.70% yields based on dry mass. The cold water soluble polysaccharide (CWSP) was taken for structural analysis. CWSP obtained was purified and fractionated by ion exchange chromatography to give neutral as well as acidic fractions. These neutral and acidic fractions were further fractionated by gel permeation chromatography to yield three neutral fractions TW1, TW2, TW3, and two acidic fractions TB1 and TB2 containing uronic acids.

The work presented in conference will focus on (i) structural studies on neutral fraction TW1 and (ii) determination of uronic acid (UA) content in polysaccharides using diverse approaches.[2,3] TW1 was obtained in 0.008% yield based on dry mass. The molecular weight determined by HP-SEC using MALLS showed a molecular weight distribution from 1.6 x 105 Da to 5.2 x 105 Da. The polysaccharide was mainly composed of 3-O-Me-arabinose, 3-O-Me-galactose and galactose in molar ratio 1:9:1, respectively. On the basis of total hydrolysis, alditol acetate, and methylation-d3 analysis, linkage has been established comprising 1,4- and 1,4,6-linked 3-O-Me-galactose, 1,3-, 1,4- and 1,3,6-linked galactose and 1,5-linked 3-O-Me-arabinose. Further, polysaccharides containing uronic acid have immense pharmaceutical and biological applications. Therefore, precise and accurate estimation of uronic acids employing widely used chromogens will be discussed with case studies.

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Ordinary Membership	Rs. 500.00 (Yearly + Admission fee of Rs. 5.00 only for new members)

Eligibility:

Ordinary/Life member; any person with degree from recognized University in basic and applied Sciences. Patron/Institutional membership; Organization/Institution concerned with Science & Technology of Carbohydrate.

Note: Application form for ACCT(I) membership may be downloaded through www.accti.in

List of newly joined ACCT(I) Life Members

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Dr. Sudhir Kashyap (LM/290/17)
MNIT Jaipur

Dr. Jhuma Ganguly (LM/291/17)
Department of Chemistry, IISt, Shibpur, City Howrah, State Bengal-Ph: 3326684561

Dr. Paolomi Merchant (LM/293/17)
Lucid Colloids, Mumbai
9324150003

List of recently appointed Young Carbohydrate Chemist in various Indian Universities

Dr Ram Sagar Mishra
(PhD: Dr A K Saw, CDRI)
Associate Professor
Banaras Hindu University

Dr Virendra Prasad
(PhD: Dr V K Tiwari, BHU)
Associate Professor
Banaras Hindu University

Dr Divya Kushwaha
(PhD: Dr V K Tiwari, BHU)
Assistant Professor
Banaras Hindu University

Dr Anindra Sharma
(PhD: Dr R P Tripathi, CDRI)
Assistant Professor
APSM College, Barouni,
LNM University, Darbhanga

Dr Dhananjay Kumar
(PhD: Dr V K Tiwari, BHU),
Assistant Professor
A. N. College, Gaya, Magadh University, Bodhgaya

Dr Vishwa Deepak Tripathi
(PhD: Dr Atul Kumar, CDRI)
Assistant Professor
LNM University, Darbhanga

Dr Nisha Saxena
(PhD: Dr R P Tripathi, CDRI)
Assistant Professor
LNM University, Darbhanga

Dr Nishant Singh
(PhD: Dr T K Chakravarti, CDRI)
Assistant Professor
LN M University, Darbhanga

Dr Garima Tripathi
Assistant Professor
Bhagalpur University, Bhagalpur

Dr Amrita Mishra
(PhD: Dr V K Tiwari, BHU)
Assistant Professor
Govt. Polytechnic College, Lucknow

We express our heartiest congratulations to these Young Carbohydrate Chemists

TCR Trends in Carbohydrate Research

Trends in Carbohydrate Research (TCR) published by ACCT(I), is completing five years of its launching and is a peer reviewed, quarterly, International, fast track, open access, e-journal on Investigation, Application and Technology of Carbohydrates and their derivatives with a distinguished editorial and advisory board composed of leading carbohydrate researches from around the world. Recently, TCR has acquired national repute with **NAAS score 3.34** and gained **impact factor 0.562.** The TCR is devoted for promotion and utilization of latest research and developments related to various scientific and technological aspects of carbohydrates. The publication of TCR will definitely affect the dynamics of Carbohydrate Science and Technology in this country and world around.

We have also decided to select one best paper per volume which has very high standard, for award of Rs. 30,000 (US $ 400) along with the certificate from the journal to this effect starting from the Silver Jubilee year of the ACCT(I) at the annual conference of carbohydrate from CARBO XXV, Shimla. The first e-TCR awardee was Dr R. P. Tripathi, Senior Scientist, Central Drug Research Institute, Lucknow. Prof Ghanshyam Chauhan received the second e-TCR award at CARBO XXVI at IICB, Kolkata. The third e-TCR award has been given to Prof Ashok Prasad, Delhi University at CARBO XXV at CFTRI Mysore. The 4th TCR Awards has been given to Prof Darren Grice, Griffith University, Australia at 'ACCT(I) International Conference on Challenges in Chemistry and Biology of Carbohydrates' held at Dehradun during 20-22, January, 2014. From 5th year award money has been increased to 30,000/ which would sponsor by PFP technology, USA, and the 5th TCR Awards has been given to Prof C P Rao, IIT Bombay. The 6th TCR Awards has been given to Prof Indrapal Singh Aidhen, IIT Madras. Recently the 7th TCR Awards has been given to Dr Claudia Pereira Passos, Coimbra at QOPNA, Departamento de Química, Universidade de Aveiro, Portugal. The title of paper is "Microwave Assisted Extraction of Carbohydrate Rich Fractions from Spent Coffee Grounds: Formulation of Biscuits Enriched in Dietary Fibre."

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Aims and Scope:

The overall aim of the TCR is to advance and disseminate knowledge in all related areas of carbohydrates to benefit the whole carbohydrate's community. It offers an international forum for exchange of latest research and developments related to various scientific and technological aspects of carbohydrates and publish original research in form of normal length research papers, short reports, review articles in the following facets lie well within the scope of this journal.

1. Carbohydrate polymers having current or potential industrial applications, their structures, properties, and modifications both chemical and microbiological.
2. Chemistry and biology of carbohydrates including synthesis, structure elucidations, stereochemistry, reaction mechanisms, isolation of natural molecules, physicochemical studies, biosynthesis, metabolism, degradation, structural and functional biochemistry, enzymes-their action and mechanism, immuno-chemistry and glycobiology.
3. Analytical methods / chemistry of carbohydrates.
4. Technologies for conversion or production of industrially important carbohydrates including methods, processes and systems.

The journal will also publish reports of conferences, book reviews, news items, details of forthcoming meetings and contribution describing industrial applications. Audience will include Scientists, Researchers, Technologists, Academia, Industrialists, R & D institutes, Universities, Planners, Users and Producers of carbohydrate products.

The Manuscript may be submitted to TCR online at www.trendscarbo.com or direct to the one of the editors. Once a manuscript has been accepted for publication, it will undergo language copy editing, type setting and reference validation in order to provide the highest publication quality. The average review time for TCR is 30-40 days from submission to final decision on a manuscript.

Looking at your expertise and experience in the area of carbohydrate research, we would like to invite you to contribute your valued manuscripts for publication in TCR. We trust that your esteemed association will definitely give new dimensions, magnitude and directions for continual promotion and growth of the TCR and in placing it in the forefront for the dissemination of novel, exciting and cutting edge research in all areas of carbohydrates.

Dr P. L. Soni
Editor-in-Chief, TCR

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5. Official capacity/ designation /nature of job:

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7. Highest academic qualification :

Degree/Diploma	Institution/University	Specialization	Year of passing

8. Publications: Number: [ ] Research/Industrial Interest:
   Patent: Number: [ ]

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   Signature, Name, & Address of the proposer.

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ISO 90001:2008 & HACCP Certified Company

Grade Name	Product	Application
SUNCOL	Native Gaur Gum Powder	Food & Pharma Industry
SUNCOL-DB	Blend of Hydrocolloids & Specialty Chemicals	Stabilizer Cum Emulsifier for Ice-cream
SUNCOS-PG	Cationic Guar Gum	Paper & Pulp Industry
SUNCOS-CG	Cationic Guar Gum	Cosmetic & Personnel Care Industry
SUNTECH	Technical Grades of Guar Gum Powder	Oil Well Drilling, Mining & Explosives
SUNTEX	Chemically Modified Derivatives of Guar, Tamarind and Starch	Textile Industry

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Lucid in thought, Lucid in deed!

Lucid Colloids Ltd. is a premier producer of Guar and other hydrocolloids for 38 years with a 58-year knowledge database inherited from its parent company Indian Gum Industries Ltd (IGI). We also manufacture Water soluble dietary fiber (from Guar Gum) in our other company called Taiyo Lucid Pvt. Ltd.

Lucid today serves various industries with products and services such as Food, pet-food, nutritional products and pharmaceuticals, Personal care products, Household products, Paints and Building and Construction, Textiles and carpets, Mining and flocculation, Oil, gas and other deep well operations, Paper, Explosives, Foundries and Ceramics, Industrial cleaners and related formulations, Agricultural formulations and applications.

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Catcol™	Rheology control agents for cosmetics, personal and oral care products.
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Galanol®	Products for oil, gas and other deep well drilling, well stimulation and related operations.
Guarplo®	Products for slurry and stick explosives.
Luctolose™ Hemicel® Daicol®	Additives for the Paper industry.
Latgel™	Products for Agriculture.
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Carpex®	Rheology control agents for carpets printing, dyeing and space dyeing.
Thixoid™	Rheology control agents for fabric printing.
Rheoluc™	Rheology control agents for water based paints, inks and building and construction products.
Sofeze®	Dry Food premixes for soft serve ice cream.
Sunfiber®	Water Soluble Dietary Fibre (partially hydrolysed guar gum).
Other hydrocolloids	Cassia, Sesbania, Tamarind, Locust Bean Gum.

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