

12 th Carbohydrate Bioengineering Meeting

Registration

13:30 - 20:00 **AULA** University of Natural Resources and Life Sciences (BOKU)
Augasse 2-6, 1190 Wien

Pre-Symposium Doctoral Programmes "BioToOP & MOLECULAR ENZYMOLOGY"*

Chair: **Dietmar HALTRICH, AT** *University of Natural Resources and Life Sciences, Vienna*

15:00 - 15:05 **Dietmar HALTRICH, AT** University of Natural Resources and Life
Sciences, Vienna
Welcome & Introduction

15:05 - 16:00 PS1 **Stephen G. WITHERS, CA** *The University of British Columbia*
Discovery, Design and Development of Human Amylase
Inhibitors: from nM to pM

16:00 - 16:20 PS2 **Markus B. TOMEK, AT** *University of Natural Resources and Life
Sciences, Vienna*
Pseudaminic and Legionaminic Acid Transferases from the
Oral Pathogen *Tannerella forsythia*

16:20 - 16:40 PS3 **Aysegül TURUPCU, AT** University of Natural Resources and Life
Sciences, Vienna
Modeling and Simulations of Glycans and Glycosylated
Proteins

16:40 - 17:00 PS4 **Martin PFEIFFER, AT** *Graz University of technology, NAWI Graz*
Phosphoryl Transfer from α -D-Glucose 1-Phosphate Catalyzed
by *Escherichia coli* Sugar Phosphate Phosphatases - From
Reaction Mechanism to Biocatalyst Design

17:00 - 17:20 PS5 **Dina VORKAPIC, AT** *University of Graz NAWI, Graz*
Deciphering the Role of O-Glycosylation in *Vibrio cholerae*

17:20 – 17:45 **Coffee Break Supported by DK BioToP & MOLECULAR
ENZYMOLOGY**

* This session is publicly accessible & the entrance is free; registration is required, registered participants of CBM12 are automatically registered for this session

Welcome & Opening Lecture

- 17:45 - 18:00 Welcome **Bernd NIDETZKY, AT** *Graz University of Technology, acib GmbH*
Birte SVENSSON, DK *Technical University of Denmark. Kgs. Lyngby*
- 18:00- 19:00 Opening **Vincent EIJSINK, NO** *Norwegian University of Life Sciences, Oslo*
Structure, Function and Application of Lytic Polysaccharide Monooxygenases (LPMOs)

Session 1 RARE SUGARS

Chair: **Birte SVENSSON, DK** *Technical University of Denmark, Kgs, Lyngby*

- 19:00 - 19:40 T1 **Hung Wen LIU, USA** *University of Texas at Austin*
Mechanistic Studies of GenK, a Cobalamin-Dependent Radical SAM Enzyme Involved in Gentamicin Biosynthesis
- 19:40 20:00 T2 **Andrea STRAZZULLI, IT** *CNR Naples*
Engineering a GH89 α -N-Acetylglucosaminidase in an α -Thioglycoligase for the Synthesis of α -N-Glycosides of Biomedical interest
- 20:00 - 22:00 **Welcome Reception @BOKU**

Session 2 NOVEL ENZYMES

Chair: **Marco MORACCI, IT** *CNR Naples*

- 08:30 - 09:10 T3 **Magali REMAUD-SIMEON, FR** *Insa Toulouse*
Discovery and Engineering of New Specificities in GH13 and GH70 Families
- 09:10 - 09:30 T4 **Henrik ASPEBORG, SE** *KTH Royal Institute of Technology, Stockholm*
Metagenomics-Based Exploration of the Moose Rumen Reveals a Multitude of Microbial Strategies for Plant Cell Wall Deconstruction
- 09:30 - 09:50 T5 **Henrik STÅLBRAND, SE** *Lund University*
Structural Enzymology of Galactomannanases for Biosynthesis and Production of Defined Glycans

- 09:50 - 10:10 T6 **Joana GANGOITI, NL** *Universty of Groningen*
Lactobacillus fermentum NCC 2970 Employs a New Glycoside
Hydrolase Family 70 4,3- α -Glucanotransferase Enzyme (GtfB)
to Synthesize a Branched Polymer with Alternating
(α 1->3)/(α 1->4) Linkages from Maltodextrins and Starch
- 10:10- 10:30 T7 **Gurvan MICHEL, FR** *CNRS, Station Biologique de Roscoff*
Habitat and Taxon as Driving Forces of Carbohydrate
Catabolism in Marine Heterotrophic Bacteria: Example of the
Model Algae Associated Bacterium *Zobellia galactanivorans*
- 10:30- 11:00 **Coffee Break**

Session 3 GLYCOENGINEERING OF MACROMOLECULES

Chair: **Carlos FONTES, PT** *NZYTech Lda., Portugal*

- 11:00- 11:40 T8 **Nico CALLEWAERT, BE** *University of Ghent*
Glycosylation Customizaton of Eukaryotic Biopharmaceutical
Expression Hosts
- 11:40 - 12:00 T9 **Oliver SPADIUT, AT** *TU Wien*
Glycoengineering of Biopharmaceuticals by using
Glycoengineered Yeasts
- 12:00 - 12:20 T10 **Antoni PLANAS, ES** *University Ramon Llull, Barcelona*
Engineering Chitin Deacetylases for Deacetylation Pattern
- 12:20 - 12:40 T11 **Paul DeANGELIS, USA** *University of Oklahoma Health
Sciences Center*
Expanding Glycosaminoglycan Chemical Space: Towards the
Creation of Sulfated Analogs, Novel Polymers and Chimeric
Constructs
- 12:40 - 13:40 **Lunch Break**

Session 4 MOLECULAR MODELLING

Chair: **Antoni PLANAS, ES** *University Ramon Llull, Barcelona*

- 13:40 - 14:20 T12 **Anne IMBERTY, FR** *CNRS Grenoble*
Microbial Lectins Binding to Human Glycans: Experimental and
Computational Studies

- 14:20 - 14:40 T13 **Carme ROVIRA, ES** *University of Barcelona*
A Front-Face Mechanism 'Synthase' Engineered from a Retaining Hydrolase. Mechanistic Insight from QM/MM Metadynamics
- 14:40 - 15:00 T14 **Marcelo GUERIN, ES** *CIC bioGUNE, Derio*
Structural Snapshots of a Retaining Glycosyltransferase Along the Catalytic Cycle: Conformational Dynamics at the Active Site
- 15:00 - 15:20 T15 **Alexandra MALES, IJK** *University of York*
Natural vs Unnatural: Computational and Experimental Studies Reveal the True Michaelis Complex Conformation of GH125
- 15:20 - 15:40 T16 **Kiyohiko IGARASHI, JP** *University of Tokyo*
Use of Advanced Atomic Force Microscopy to Understand the Mechanisms of CAZymes on their Substrate
- 15:40 17:00 **POSTER SESSION 1 & Coffee Break**
Even number presenters (except for short talks) will be available for discussion

Session 5 GLYCOSYL TRANSFERASES – SUSY*

Chair: **Vladimir KREN, CZ** *Academy Sciences of the Czech Republic, Prague*

- 17:00- 17:40 T17 **Tom DESMET, BE** *Ghent University, Center for Industrial Biotechnology and Biocatalysis*
From Sucrose to Glycoside: Enzyme and Process Engineering
- 17:40 - 18:00 T18 **Jürgen SEIBEL, DE** *University of Würzburg*
Synthesis and Application of Sucrose Analogues
- 18:00 - 18:20 T19 **Alexander GUTMANN, AT** *Graz University of Technology*
Unlocking the Synthetic Potential of Sucrose Synthase in Biocatalytic Cascade Reactions
- 18:00 - 18:40 T20 **Lara TROBO MASEDA, ES** *CSIC, Madrid*
Co-Immobilization of Glycosyl Transferases and Sucrose Synthase: Regioselective Glycosylation by Using Traces of UDP
- 18:40 - 19:00 T21 **Martin LEMMERER, AT** *acib GmbH, Graz*
Integrated Process Design for Biocatalytic Synthesis by a Leloir Glycosyltransferase: UDP-Glucose Production With Sucrose Synthase
- 19:00 - 21:00 **Free of Charge & Publicly Accessible Get Together Supported by EU Project SUSY @BOW**

Tuesday April 25th 2017

Session 6 CARBOHYDRATE METABOLISM IN THE HUMAN GUT

Chair: **Lubbert DIJKHUIZEN, NL** *University of Groningen*

- 08:30 - 09:10 T22 **Natalie JUGE, UK** *IFR Norwich*
The Mucin-Degradation Strategy of *Ruminococcus gnavus*: The Importance of Intramolecular Trans-Sialidases.
- 09:10 - 09:30 T23 **Shinya FUSHINOBU, JP** *The University of Tokyo*
Structure of LnbX Lacto-N-Biosidase from *Bifidobacterium longum* and its Indispensability for Growth on Human Milk Oligosaccharides
- 09:30 - 09:50 T24 **Harry BRUMER, CA** *University of British Columbia, Vancouver*
Polysaccharide Utilization Loci: Fuelling Microbial Communities
- 09:50 - 10:10 T25 **Maher ABOU HACHEM, DK** *Technical University of Denmark. Kgs. Lyngby*
Role of Human Gut *Lactobacilli* in the Bioconversion of Glyco-Conjugated Phytochemicals
- 10:10 - 10:40 **Coffee Break**

Session 7 CARBOHYDRATES IN HEALTH AND MEDICINE

Chair: **Magali REMAUD-SIMEON, FR** *INSA Toulouse*

- 10:40 - 11:20 T26 **Gerlind SULZENBACHER, FR** *CNRS, University of Marseille*
X-ray Structure of Human Lysosomal Acid-Alpha-Glucosidase Provides Insight into Pompe Disease
- 11:20 - 11:40 T27 **Andreas VOGEL, DE** *C-lecta GmbH, Leipzig*
Development of Industrial Enzymatic Production Processes for Carbohydrate Ingredients
- 11:40 - 12:00 T28 **Roberta IACONO, IT** *CNR Naples*
Pharmacological Enhancement of the Human Acid-Alpha-Glucosidase by Allosteric Chaperones
- 12:00 - 12:20 T29 **Liang WU, UK** *University of York*
Activity Based Probes for Functional Interrogation of Human Heparanase
- 12:20 - 13:20 **LUNCH BREAK**

Short Talks

Chairs: **Takashi KURIKI, JP** *Ezaki Glico Co. Ltd*

& **Clemens K. PETERBAUER, AT** *University of Natural Resources and Life Sciences, Vienna*

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| 13:20 - 13:25 | ST1 | Shifra LANSKY, IL <i>The Hebrew University of Jerusalem</i>
Multiple Conformational States of a Unique Extracellular Arabinanase Suggest a "Harpoon" Mechanism of Action |
| 13:25 - 13:30 | ST2 | Lucia FRANOVÁ, SK <i>Slovak Academy of Science, Bratislava</i>
Novel Substrates for Microbial Glucuronoyl Esterases — Enzymes with still Unexplored Biotechnological Potential |
| 13:30 - 13:35 | ST3 | Haiyang WU, FR <i>INSA Toulouse</i>
Characterization of an Unusual Multi-Modular GH10 Xylanase from Termite Gut |
| 13:35- 13:40 | ST4 | Chartchai KHANONGNUCH, TH <i>Chiang Mai University</i>
Properties of a Novel Extracellular Exo-Type Amylase from the Insect-Parasitic Fungus <i>Cordyceps militaris</i> Produced during Cultivation on Rice Starch Based Medium |
| 13:40 - 13:45 | ST5 | Laura IANCU, NL <i>DuPont Industrial Biosciences, Leiden</i>
Esterases in Detangling the Complex Structure of Plant Biomass — With the Help of a CBM |
| 13:45 - 13:50 | ST6 | Josef VOGLMEIR, CN , <i>Nanjing Agricultural University</i>
<i>Shewanella woodyi</i> Galactokinases Phosphorylate Glucose at the 6-Position |
| 13:50 - 13:55 | ST7 | Dominic LAAF, DE <i>Department of Biotechnology and Helmholtz-Institute for Biomedical Research, Aachen</i>
Tailor-Made Neo-Glycoproteins: Synthesis, Screening and Application |
| 13:55 - 14:00 | ST8 | Beatriz TRASTOY, ES <i>CIC BioGUNE, Derio</i>
EndoS: an Enzymatic Tool to Glycoengineer Antibodies |
| 14:00 - 14:05 | ST9 | Elizabeth FICKO-BLEAN, FR <i>CNRS, Station Biologique de Roscoff</i>
Unraveling the Multivalent Binding of a Marine Family 6 Carbohydrate-Binding Module with its Native Laminarin Ligand |
| 14:05 - 14:10 | ST10 | Anna ARONSSON, SE <i>Lund University</i>
Structural Insights of RmXyn10A - a GH10 Xylanase with Diverse Aglycone Subsites |

- 14:10 - 14:15 ST11 **Lluís RAICH, ES** *University of Barcelona*
A Trapped Covalent Intermediate of a Glycoside Hydrolase on the Pathway to Transglycosylation. Insights from QM/MM Simulations.
- 14:15 - 14:20 ST12 **Lucy CROUCH, UK** *Newcastle University*
Novel Enzymes from the Human Gut Microbiota for Degrading *N*-Glycans
- 14:20- 14:25 ST 13 **Viktorija BÅGENHOLM, SE** *Lund University*
Galactomannan Catabolism Conferred by a Polysaccharide Utilisation Locus of *Bacteroides ovatus*
- 14:25 - 14:30 ST14 **Alicia LAMMERTS VAN BUEREN, NL** *University of Groningen*
How GOS Function to Enhance the Beneficial Properties of Infant Formula via Effects on the Microbiome
- 14:30 - 14:35 ST15 **Hiroko YATSUHASHI, JP** *Ezaki Glico Co. Ltd./ Institute of Health Sciences, Osaka*
Qualitative and Quantitative Analyses of Glycogen in Milk
- 14:35 - 14:40 ST16 **Natalia COMINO, ES** *CIC BioGUNE, Derio*
Structural Basis of Glycogen Biosynthesis Regulation in Bacteria
- 14:40 - 14:45 ST17 **Lukasz Filip SOBALA, UK** *University of York*
Inhibition and Mechanism of GH99 - a Key Golgi *N*-Glycosylation Pathway Enzyme
- 14:45 - 14:50 ST18 **Dejan PETROVIC, NO** *Norwegian University of Life Sciences, Oslo*
Fungal Lytic Polysaccharide Monooxygenases with Broad Xyloglucan Specificity
- 14:50- 14:55 ST 19 **Daniel KRACHER, AT** *University of Natural Resources and Life Sciences, Vienna*
Biophysical Factors Influencing the Stability of Lytic Polysaccharide Monooxygenases
- 14:55 - 15:00 ST20 **Johannes FUHRER, AT** *University of Natural Resources and Life Sciences, Vienna*
Enzymatic Isotope Labeling of *O*-Glycans for Improved Tumor Biomarker Analysis
- 15:00 - 15:05 ST21 **Sascha WEIDLER, DE** *University of Bayreuth*
Semisynthesis of Sialylated and Paucimannosidic Glycoforms of Human Interleukin 6

- 15:05 – 15:10 ST22 **Johnny BIRCH, DK** *Technical University of Denmark, Copenhagen*
HEXPIN: Hetero-Exopolysaccharide — Milk Protein Interactions
- 15:10- 15:15 ST23 **Artur ROGOWSKI, IR** *Megazyme, Bray*
An Automatable, Enzyme-Coupled Assay Procedure for the Measurement of Endo-1,4- β -Xylanase Activity Employing a Novel Colourimetric Hexasaccharide Substrate
- 15:15 - 17:00 **POSTER SESSION 2 & Coffee Break**
Odd number & short talk presenters will be available for discussion

Session 8 CARBOHYDRATE OXIDOREDUCTASES/LPMOS

Chair: **Gideon J. DAVIES, UK** University of York

- 17:00 - 17:20 T30 **Leila LO LEGGIO, DK** *University of Copenhagen*
Fungal LPMOs and their Interactions with Ligands: What Have We Learned from Crystal Structures?
- 17:20 - 17:40 T31 **Roland LUDWIG, AT** *University of Natural Resources and Life Sciences, Vienna*
How a Newly Discovered Enzyme Shatters our Beliefs in the Function of Well-known Fungal Oxidoreductases
- 17:40 - 18:00 T32 **Jennifer LOOSE, NO** *Norwegian University of Life Sciences, Oslo*
Activation of Bacterial Lytic Polysaccharide Monooxygenases by Cellobiose Dehydrogenase and Mutational Mapping of Catalytically Important Residues
- 18:00 - 18:20 T33 **Manuel EIBINGER, AT** *Graz University of Technology*
Auxiliary Activities and their Effect on the Cellulosic Surface: Swollenin and Lytic Polysaccharide Monooxygenase
- 20:00 - open **Conference Dinner @Rathauskeller***

***Wiener Rathauskeller**
Rathaussplatz 1
1010 Wien
+43(0) 50 876-1001
office@wiener-rathauskeller.at
www.wiener-rathauskeller.at/en

Wednesday April 26th 2017

Session 9 GLYCOSYL TRANSFERASES & SYNTHETIC APPLICATIONS

Chair: **Stephen G. Withers, CA** *The University of British Columbia*

- 09:00 - 09:40 T34 **Xi CHEN, USA** *University of California, Davis*
Saturation Mutagenesis and Screening of Sialyltransferase Mutants as Tools for Carbohydrate Synthesis and Analysis
- 09:40 - 10:00 T35 **Shonoi MING, USA** *U.S. Food and Drug Administration, Silver Spring*
Kinetic Characterization of Neisseria meningitidis Group C Polysialyltransferase
- 10:00 - 10:20 T36 **Motomitsu KITAOKA, JP** *National Agriculture and Food Research Organization, Ibaraki*
Practical One-Pot Enzymatic Glycosylation from Free Monosaccharide Employing Anomeric Kinase and Phosphorylase with Novel ATP-Regeneration System
- 10:20 - 10:40 T37 **Friedericke BÖNISCH, DE** *University Hamburg*
Biotechnological 5-O-Rhamnosylation of Small Molecules: A Unique Enzyme Activity to Create New-to-Nature Flavonoid Glycosides
- 10:40 - 11:10 **Coffee Break**

Session 10 BIOMATERIALS

Chair: **Carsten Andersen, DK** *Novozymes A/S, Bagsvaerd*

- 11:10 - 11:50 T38 **Thomas ROSENAU, AT** *University of Natural Resources and Life Sciences, Vienna*
Celluloses I and II - Some News from an Old Polymer
- 11:50 - 12:10 T39 **Maija TENKANEN, FI** *University of Helsinki*
Enzymatic Oxidations Enable Production of Novel Light-Weight Polysaccharide Aerogels
- 12:10 - 12:30 T40 **Marc VAN DER MAAREL, NL** *University of Groningen*
Structural Characteristics and Functional Properties of the Highly Branched Glycogen from the Extremophilic Red Microalga *Galdieria sulphuraria*

12:30- 12:50	T41	Pavla BOJAROVA, CZ Academy of Sciences of the Czech Republic, Prague Multivalent HPMA Glycopolymers as Efficient Lectin Ligands
12:50 - 13:00	Closing	Bernd NIDETZKY, AT Graz University of Technology, acib GmbH Closing Remarks