



# 24<sup>th</sup> Austrian Carbohydrate Meeting



Vienna, 13.2.2020-14.2.2020

TUtheSky @ TU Wien, Getreidemarkt 9, 1060 Wien

Thursday, February 13<sup>th</sup>, 2020

**12:00-12:30 Come together with coffee, drinks and snacks**

**12:30-12:45 Welcome addresses**

**12:45-14:00 Session 1**

## **Carbohydrate Microarrays as tools to study invertebrate glycosylation**

Barbara Eckmair<sup>1</sup>, Francesca Martini<sup>2</sup>, Alba Hykollari<sup>1</sup>, Katharina Paschinger<sup>1</sup>, Iain Wilson<sup>1</sup>

<sup>1</sup>Department für Chemie, Universität für Bodenkultur Wien, 1190 Wien, Austria

<sup>2</sup>Malcisbo AG, Wagistrasse 27a, 8952 Schlieren, Switzerland

## **Selective Profiling of Carbohydrate-processing Enzymes: A ligand directed chemistry concept**

Andreas Wolfsgruber<sup>1</sup>, Martin Thonhofer<sup>1</sup>, Tanja Wrodnigg<sup>1,\*</sup>

<sup>1</sup>Graz University of Technology, Institute of Chemistry and Technology of Biobased Systems

## **Novel insights into peptidoglycan metabolism – results from the oral pathogen *Tannerella forsythia***

Valentina M. T. Mayer<sup>1</sup>, Isabel Hottmann<sup>2</sup>, Rudolf Figl<sup>3</sup>, Friedrich Altmann<sup>3</sup>, Christoph Mayer<sup>2</sup>, Christina Schäffer<sup>1\*</sup>

<sup>1</sup>BOKU Wien, Department of NanoBiotechnology, NanoGlycobiology unit

<sup>2</sup>Eberhard Karls Universität, Germany, Department of Biology, Interfaculty Institute of Microbiology and Infection Medicine

<sup>3</sup>BOKU Wien, Department of Chemistry, Institute of Biochemistry

## **Iminosugar based Glycomimetics as potential Probes for Activity Based Protein Profiling of Carbohydrate-processing Enzymes**

Martin Thonhofer<sup>1</sup>, Andreas Wolfsgruber<sup>1</sup>, Tanja Wrodnigg<sup>1,\*</sup>

<sup>1</sup>TU Graz, Institute of Chemistry and Technology of Biobased Systems

## **Indium-mediated Allylation of Disaccharides**

Christian Denner<sup>1</sup>, Manuel Gintner<sup>1</sup>, Hanspeter Kählig<sup>1</sup>, Walther Schmid<sup>1</sup>

<sup>1</sup>Department of Organic Chemistry, University of Vienna

**14:00-14:45 Coffee Break**

sponsored by reference analytics



## **14:45-16:00 Session 2**

### **Synthesis of C-glycosyl phosphonate derivatives of 4-amino-4-deoxy- $\alpha$ -L-arabinose**

Lukáš Kerner<sup>1</sup> and Paul Kosma\*

<sup>1</sup>University of Natural Resources and Life Sciences-Vienna, Department of Chemistry, Muthgasse 18, A-1190 Vienna, Austria

### **Synthesis of Lipid A mimetics for modulation of TLR4-dependent cellular responses**

Sebastian Strobl<sup>1</sup>, Karin Hofbauer, Alla Zamyatina<sup>1,\*</sup>

<sup>1</sup>University of Natural Resources and Life Sciences, Institute of Organic Chemistry

### **Critical enzymatic steps in the biosynthesis of pyruvylated bacterial cell wall glycopolymers**

Cordula Stefanovic<sup>1</sup>, Fiona Hager<sup>1</sup>, Christina Schäffer<sup>1</sup>, Markus Blaukopf<sup>2</sup>, Paul Kosma<sup>2</sup>

<sup>1</sup>BOKU Wien, Institute of Biological Inspired Materials

<sup>2</sup>BOKU Wien, Institute of Organic Chemistry

### **Development of neuraminidase resistant glycolylneuraminic acid functionalized supports for immunological application**

Davide Ret<sup>1,2</sup>, Erika Gasparotto<sup>1,2</sup>, Davide Scaramuzza<sup>1</sup>, Nazanin Samadi<sup>2</sup>, Eva Untersmayr<sup>2</sup>, Simone Knaus<sup>1</sup>

<sup>1</sup>TU Wien, Institute of Applied Synthetic Chemistry

<sup>2</sup>Medical University of Vienna, Institute of Pathophysiology and Allergy Research

### **The spectacular world of microalgae N-Glycosylation**

Reka Mocsai<sup>1</sup>, Rudolf Figl<sup>1</sup>, Marcus Blaukopf<sup>1</sup>, Paul Kosma<sup>1</sup>, Friedrich Altmann<sup>1</sup>

<sup>1</sup>BOKU Vienna, Department of Chemistry

## **16:00-16:30 Beer Break**

sponsored by Büchi



## **16:30-17:15 LOBA Plenary lecture Prof. Jeroen Codée**



### **A SWEET TWIST – How conformation shapes reactivity in glycosylation reactions**

Jeroen Codée, Leiden University, Institute of Chemistry, The Netherlands

## **17:15 Discussion (Tanja Wrodnigg)**

General topics of the Austrian Network of Carbohydrates and Glycoconjugates, Future Meetings, Conferences and Symposia

## **18:00 End of scientific program Day 1**

♥ Friday February, 14<sup>th</sup>, 2020. ♥

**09:00-09:45 GÖCH Plenary lecture Dr. Fabian Pfrenge**



**Synthetic plant glycans as tools for cell wall biology**

Fabian Pfrenge, Max Planck Institute of Colloids and Interfaces, Dep. of Biomolecular Systems

**10:00-11:45 Session 3**

**Rational enzyme design without structural knowledge: a sequence-based approach for efficient generation of glycosylation catalysts**

David Teze<sup>1</sup>

<sup>1</sup>The Novo Nordisk Foundation Center for Biosustainability (DTU Biosustain)

**Transglycosidase Activity of Glycosynthase-type Mutants of a Fungal GH20  $\beta$ -N-Acetylhexosaminidase**

Kristýna Slámová<sup>1</sup>, Jana Kapešová<sup>1</sup>, Zuzana Straková<sup>1</sup>, Natalia Kulik<sup>2</sup>, Lucie Petrásková<sup>1</sup>, Vladimír Křen<sup>1</sup>

<sup>1</sup>Laboratory of Biotransformation, Institute of Microbiology of the CAS, Prague, Czech Republic;

<sup>2</sup>Center for Nanobiology and Structural Biology, Institute of Microbiology of the CAS, Nové Hradky, Czech Republic

**Aryl Disubstituted Thiodigalactosides: Prospective Small Molecule Galectin Inhibitors**

Pavla Bojarová<sup>1,\*</sup>, Tomáš Vašíček<sup>1</sup>, Vojtěch Spiwok<sup>2</sup>, Vladimír Křen<sup>1</sup>

<sup>1</sup>Laboratory of Biotransformation, Institute of Microbiology of the Czech Academy of Sciences, Vídeňská 1083, CZ-14220 Praha 4, Czech Republic;

<sup>2</sup>University of Chemistry and Technology, Prague, Technická 5, CZ-16628 Praha 6, Czech Republic

**Rutinosidase from *Aspergillus niger*: Crystal structure and insight into the enzymatic activity**

Michael Kotik<sup>1,\*</sup>, Petr Pacht<sup>2</sup>, Jana Kapešová<sup>1</sup>, Jiří Brynda<sup>2,3</sup>, Lada Biedermannová<sup>4</sup>, Helena Pelantová<sup>1</sup>, Pavla Bojarová<sup>1</sup>, Vladimír Křen<sup>1</sup>, Pavlína Řezáčová<sup>2,3</sup>

<sup>1</sup>Institute of Microbiology of the Czech Academy of Sciences, Prague

<sup>2</sup>Institute of Organic Chemistry and Biochemistry of the Czech Academy of Sciences, Prague

<sup>3</sup>Institute of Molecular Genetics of the Czech Academy of Sciences, Prague

<sup>4</sup>Institute of Biotechnology of the Czech Academy of Sciences, BIOCEV, Vestec

**Enzymatic oxidation of cellulose by fungal lytic polysaccharide monoxygenases**

Daniel Kracher<sup>1,2,\*</sup>, Erik Breslmayr<sup>2</sup>, Tobias M. Hedison<sup>1</sup>, Derren J. Heyes<sup>1</sup>, Frantisek Filandr<sup>3</sup>, Petr Man<sup>3</sup>, Petr Halada<sup>3</sup>, Nigel S. Scrutton<sup>1</sup>, Roland Ludwig<sup>2</sup>

<sup>1</sup>The University of Manchester, UK, Manchester Institute of Biotechnology

<sup>2</sup>BOKU Vienna, The Biocatalysis and Biosensing Laboratory

<sup>3</sup>Charles University Prague, Department of Biochemistry

**11:15-11:45 Coffee break**

sponsored by Magritek



## **11:45-13:00 Session 4**

### **Single Step S-GlcNAcylation of Peptides and Proteins using Mutant Hexosaminidases**

Gregor Tegl<sup>1</sup>, John Hanson<sup>2</sup>, Hong-Ming Chen<sup>1</sup>, David H Kwan<sup>1</sup>, Andres G Santana<sup>1</sup>, Stephen G Withers<sup>1</sup>

<sup>1</sup>University of British Columbia, CA, Department of Chemistry

<sup>2</sup>University of Puget Sound, USA, Department of Chemistry

### **Optimized Expression of Carbohydrate-active Enzymes**

Roland Martzy<sup>1,2</sup>, Robert Mach<sup>2</sup>, Debbie Yaver<sup>3</sup>, Astrid Mach-Aigner<sup>1,2,\*</sup>

<sup>1</sup>TU Wien, Christian Doppler Laboratory for Optimized Expression of Carbohydrate-active Enzymes

<sup>2</sup>TU Wien, Institute of Chemical, Environmental and Bioscience Engineering

<sup>3</sup>Production Strain Technology, Novozymes Inc.

### **4-epi-isofagomine derivatives versus functionalized aminocyclopentanes: Synthesis and biological Evaluation**

Patrick Weber<sup>1</sup>, Arnold Stütz<sup>1</sup>

<sup>1</sup>Graz University of Technology, Institute of Chemistry and Technology of biobased Systems

### **Synthesis of iminosugar based multivalent glycomimetics as ligands for glycoprocessing enzymes**

Sara Fasol<sup>1,2</sup>, Barbara LaFerla<sup>1</sup>, Tanja M. Wrodnigg<sup>2</sup>

<sup>1</sup>Milano Bicocca University, Biotechnology and Biosciences Department

<sup>2</sup>Graz University of Technology, Institute of Chemistry and Technology of biobased Systems

### **Divergent synthesis of oligomannosides for further immunisation studies against HIV**

Matteo Cattin<sup>1</sup>, Ralph Pantophlet<sup>2</sup>, Paul Kosma<sup>1</sup>

<sup>1</sup>Dept. Chemistry, University of Natural Resources and Life Sciences-Vienna, Austria

<sup>2</sup>Faculty of Health Sciences and Dept. of Molecular Biology and Biochemistry, Simon Fraser University, Burnaby, Canada.

## **13:00 Closing remarks**

## **Poster Session**

*Posters will be available throughout the whole workshop in the poster area.*

### **Synthetic substrates for glycosynthases**

Dorota Konvalinková<sup>1</sup>, Michaela Hovorková<sup>1</sup>, Pavla Bojarová<sup>1</sup> and Vladimír Křen<sup>1</sup>

<sup>1</sup>Laboratory of Biotransformation, Institute of Microbiology of the Czech Academy of Sciences, Czech Republic

### **Fungal transglycosidases for the preparation of antimicrobial chitooligosaccharides**

Zuzana Straková<sup>1,2</sup>, Kristýna Slámová<sup>1</sup>, Natalia Kulik<sup>3</sup>, Lucie Petrásková<sup>1</sup>, Vladimír Křen<sup>1</sup>

<sup>1</sup>Institute of Microbiology, Czech Academy of Sciences, Czech Republic,

<sup>2</sup>University of Chemistry and Technology, Czech Republic

<sup>3</sup>Center for Nanobiology and Structural Biology, Nové Hradky, Czech Republic.

### **Enzymatic Synthesis of Disaccharide Epitopes and Their Affinity to Galectins**

Jakub Červený<sup>1</sup>, Lothar Elling<sup>2</sup>, Vladimír Křen<sup>1</sup> and Pavla Bojarová<sup>1</sup>

<sup>1</sup>Laboratory of Biotransformation, Institute of Microbiology of the Czech Academy of Sciences, Czech Republic

<sup>2</sup>Laboratory for Biomaterials, Institute for Biotechnology and Helmholtz-Institute, for Biomedical Engineering, RWTH Aachen University, Pauwelsstraße 20, D-52074 Aachen, Germany

### **Unique dual substrate specificity of the rutinoidase from *Aspergillus niger* – a potent glycosylation engine**

Katerina Brodsky<sup>1,2</sup>, Michael Kotík<sup>2</sup>, Pavla Bojarová<sup>2</sup> and Vladimír Křen<sup>2</sup>

<sup>1</sup>Institute of Microbiology of the Czech Academy of Sciences, Czech Republic,

<sup>2</sup>University of Chemistry and Technology, Czech Republic