

CCC SYMPOSIUM

2022 May 31st

abstract booklet



Groningen

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Program

10.00 - 10.30	Registration, coffee & tea
10.30 - 10.45	Welcome by prof. dr. Gert-Jan Euverink (CCC)
10.45 - 11:15	Prof. dr. Adrie Minnaard (RUG) All Creatures Great and Small. The synthesis and modification of complex natural products.
11.15 - 11.45	Prof. dr. Manfred Wuhrer (LUMC) Human structural and functional glycomics
11.45 - 12.30	Networking and poster session
12.30 - 14.00	Lunch break
14.00 - 14.30	Dr. Martin Beukema (UMCG) Structure-function relationship between homogalacturonan pectins and intestinal immunity: microbiota-(in)dependent effects on the gastrointestinal immune barrier.
14.30 - 15.00	Dr. Clara Belzer (WUR) Nutritional strategies for mucosal health: the interplay between microbes and mucin glycans.
15.00 - 16.00	Networking and poster session
16.00 - 16.30	Dr. Hans Leemhuis (AVEBE) Starch based food ingredients and biobased materials
16.30 - 16.45	Rudy Rabbinge hands over the best poster award
16.45 - 17.00	Closing Remarks prof. dr. Henk Schols (CCC)



Introducing the speakers & their topics

**BIO &
ABSTRACT**





PROF. DR. ADRIE MINNAARD (STRATINGH INSTITUTE FOR CHEMISTRY, RUG)

All Creatures Great and Small.

The synthesis and modification of complex natural products

Bio

Adriaan Minnaard obtained his PhD in Organic Chemistry at Wageningen Agricultural University and after a short industrial stay at DSM joined the Stratingh Institute for Chemistry at the university of Groningen. He is professor in Chemical Biology, and from 2016 to 2022 he has been director of the Stratingh Institute. His research interests are the synthesis and modification of complex natural products and in order to do this, his group contributes as well to the development of new synthesis methods. He teaches organic chemistry in Chemistry, Biology, Pharmacy, and Life Science & Technology. In 2020, his research on tuberculosis was awarded with the NWO-TEAM science award.

Abstract

Next to the primary compounds produced by a cell; the nucleic acids, proteins and polysaccharides, there is an endless number of “secondary metabolites” or “natural products”. Many of these are amenable to chemical synthesis which is sometimes required to elucidate their structure, sometimes to study them in biology, and sometimes to use them to our advantage such as in medicine or materials. The lecture will present the synthesis of several natural products, or the modification of them, with applications ranging from biological pest control, the immunology of tuberculosis and the development of novel antibiotics.



PROF. DR. MANFRED WUHRER (LUMC)

Human structural and functional glycomics.

Bio

Prof. Manfred Wuhrer is Head of the Center for Proteomics and Metabolomics at the Leiden University Medical Center. <https://www.lumc.nl/org/proteomics-metabolomics/>

He studied Biochemistry at Regensburg University and obtained his PhD in 1999 at Giessen University, Germany. Subsequently, he joined the Leiden University Medical Center where he was appointed assistant professor in 2005 and associate professor in 2008. In 2013, he was appointed full professor Analytics for Biomolecular Interactions at VU University Amsterdam. In 2015 he continued his career as Head of Center for Proteomics and Metabolomics at LUMC. Since 2016 he is chair of the Dutch Society for Mass Spectrometry (<https://www.nvms.nl/>). He focuses on the development of mass spectrometric methods for glycomics and glycoproteomics, and their application in clinical research and biotechnology. Clinical applications cover the fields of rheumatoid arthritis, inflammatory bowel disease, colorectal cancer, prostate cancer, longevity, as well as various infectious diseases.

Abstract

Saccharides or glycans occur in humans in highly diverse forms, be it as free oligo- or polysaccharides, or conjugated to proteins or lipids. These glycans exhibit an array of different functions in e.g. development, immunity, infection and cancer. A glycoanalytical toolbox will be presented for the structural and functional characterization of glycosylation. Tools for assessing the structure and function of antibody glycosylation will be presented in the context of Covid19 research. A tissue glycomic pipeline based on laser capture microdissection will be introduced allowing the detailed characterization of aberrant protein glycosylation of cancer cells from tumor biopsies applying porous graphitized carbon chromatography together with negative-mode tandem mass spectrometry of oligosaccharides. Large-scale glycomic datasets obtained from blood samples of thousands of individuals will be presented revealing the glycomic signatures of prevalent human diseases. Finally recent attempts will be highlighted exploring the use of mass spectrometry for the intact analysis of polysaccharides from human as well as non-human sources.

DR. MARTIN BEUKEMA (UMCG)

Structure-function relationship between homogalacturonan pectins and intestinal immunity

Bio

Martin Beukema obtained his bachelor's degree at the Hanze University of Applied Sciences in Groningen and his master's degree at the University of Groningen. After his master's, he started as a PhD student in the group of Paul de Vos at the department of Medical Biology at the University Medical Center in Groningen (UMCG). During his PhD, Martin investigated the structure-function relationship between homogalacturonan pectin and intestinal immunity. This project was part of the Carbohydrate Competence Center (Carbokinetics) and in close collaboration with Éva Jermendi and Prof. dr. Henk Schols of the Food Chemistry department of Wageningen University. In November 2021, Martin obtained his PhD degree cum laude at the University of Groningen. At the moment, he is working as a postdoctoral researcher at the UMCG.

Abstract

Pectins are dietary fibers that have been recognized to reduce the incidence of lifestyle-related disease. Pectins can contain several chemical structures, including homogalacturonan regions which consist of a galacturonan backbone. These galacturonans can be methyl-esterified causing a difference in the degree and distribution of methyl-esters in pectins. It is known that pectins can influence the intestinal immune system, but which specific structures are responsible for these effects is unknown. During this talk, I will give an overview of the work of my PhD in which I investigated how the degree and distribution of methyl-esters in pectins influence the gastrointestinal immune barrier through direct interactions with the immune system or microbiota-dependent ways.

DR. CLARA BELZER (WUR)

Nutritional strategies for mucosal health:
the interplay between microbes and mucin glycans.

Bio

Dr. Clara Belzer is Associate Professor Microbiology at the Laboratory of Microbiology of Wageningen University. In the Belzer group 'Microbes Mucus and Milk' research is focused on the interaction of the gut microbiome with host produces glycans present in mucus and milk. After obtaining her PhD at the Erasmus Medical Center dr. Belzer did a posdoc at Harvard medical school. By now dr. Belzer has years of experience on gut microbiome studies on gut anaerobes, including synthetic communities and different biotic concepts, with a special interest for the *Akkermansia muciniphila*. The group of dr. Belzer works on several microbiome HMO and mucus related topics funded by national and international grants, some also in collaboration medical centers and industry.

Abstract

Research at the Microbes Mucus and Milk team at the laboratory of Microbiology at Wageningen University investigates the interplay between intestinal microbes and human mucus and human milk oligosaccharides. How does the glycan landscape in the gut influence the microbial colonization and activities? The ability of the microbiome to ferment host-produced glycans makes them keystone species within the intestinal microbiota, crucial for immune, metabolic and neurologic imprinting. Interaction between microbes mucus and milk leads to dependencies shaping the overall intestinal microbiome structure in early and later life, and microbial roles in maintaining host health. Additionally, this leads to applicability of milk glycans for nutritional strategies, such as innovative nutritional and microbial intervention strategies by which the structure and function of the microbiome can be modulated to prevent or treat disease.



DR. HANS LEEMHUIS (AVEBE)

Starch based food ingredients and biobased materials



Bio

Hans studied chemistry at the University of Groningen. After his PhD on starch acting enzymes he moved to the Cambridge working on enzyme evolution. His research on carbohydrate acting enzymes then continued back in Groningen being funded by a Veni grant and the CCC. In 2012 Hans moved to Avebe working as a principal scientist with a clear focus on starch, developing starch derivatives with new functionalities.



Abstract

At Avebe we separate potatoes into carbohydrates and plant-based protein. The starch product is a seemingly simple carbohydrate consisting of glucose only. Its functional behavior is reasonably well understood, nevertheless there are remaining challenges. For example, for many applications starches require a mild chemical modification to deliver the desired functionality. Because the increasing interest in simple and clean label food ingredients, there is a growing market for functional starches manufactured without chemistry. One approach is to alter and/or improve the starch functionality by employing the catalytic power of enzymes. Here recent developments in the enzymatic conversion of starch structures, and the use of these altered starch architectures in applications, will be discussed.



Participants

first name	last name	organization
Kahlile	Abboud	Maastricht University
Carlos	Agudelo	FrieslandCampina Ingredients
Renate	Akkerman	University Medical Centre Groningen
Marcela	Aparicio	NutriLeads
Edwin	Bakx	Wageningen university
Hilda	Bax	University of Groningen
Clara	Belzer	WUR
Martin	Beukema	UMCG
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Participants

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Participants

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THANK YOU
for attending the
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