

MICROBIOME & PROBIOTICS **SERIES**: EUROPE

6TH MICROBIOME R&D & BUSINESS COLLABORATION FORUM 3RD PROBIOTICS CONGRESS

SKIN MICROBIOME & COSMECEUTICALS CONGRESS

ROTTERDAM, THE NETHERLANDS

-20-22 May 2019-











Global Engage is pleased to announce, the **Microbiome & Probiotics Series: Europe**, which is confirmed to take place on May 20-22, 2019 at the World Trade Center in Rotterdam, the Netherlands. Expanded to 3 days and incorporating the 6th **Microbiome R&D and Business Collaboration Forum**, 3rd **Probiotics Congress** and the new **Skin Microbiome and Cosmeceuticals Congress** this three for the price of 1 ticket event will provide unrivalled access to cutting-edge science and the key challenges and topics facing researchers and product developers, whilst providing extended time to establish partnerships and do business.

Network with over 400 attendees; hear from over 100 top scientists in the field; pitch and exchange details with willing investors and collaborators; learn about exciting new companies in the microbiome and probiotics space through individual talks, company showcases, panel and roundtable sessions, early career researcher presentations and poster prize winner talks. There will always be a presentation of interest!

With ample networking time onsite during the day and offsite at night, in order to take advantage of the wealth that Rotterdam has to offer, there will be many opportunities to broaden your connections and maximise your time at the meeting!

With sister Series in America each October and Asia in March the Global Engage series has a fantastic reputation as the number one microbiome & probiotics networking event for fostering partnerships across academia, pharma, biotech and cosmetics. If looking to either learn more from the top scientists in the space; showcase exciting developments in your research; or seek partnerships and funding within the industry; it is 3 days not to be missed!



www.global-engage.com/event/microbiomeprobiotics-series



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KAREN NELSON President, J. Craig Venter Institute, USA



CHRISTOPHE LACROIX Professor, Laboratory of Food Biotechnology, Department of Health Sciences and Technology, ETH Zürich, Switzerland



REYES CSO and Founder, Bloom Science, USA

CHRISTOPHER



PIERRE LESTAGE CEO, NeribiOm, France



NIKOLE KIMES Founder, President & CSO, Siolta Therapeutics, USA



DIRK LOFFERT CEO, Biomillenia SAS, France



3RD PROBIOTICS FORUM



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CAROLINE KURTZ Senior Vice President and Head of Metabolic Microbiology, Centre for Programs, Synlogic Inc., USA



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ANNICK MERCENIER CIO, Nutrileads, The Netherlands



HIMANSHU KUMAR Senior Scientist. Danone Nutricia Research, The Netherlands



MARKUS LEHTINEN R&D Manager, DuPont Nutrition & Health, Finland



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BERNHARD PAETZOLD Co-Founder & Chief Scientific Officer S-Biomedic, Spain



ELSA JUNGMAN Founder and CEO, ELSI Skin Health



ERIC HUANG Chair Professor, National Central University, Taiwan; Adjunct Professor, Department of Dermatology, University of California, San Diego, USA



AUDREY GUENICHE Senior Clinical Expert, Advanced Research, L'Oréal Research & Innovation, France



RICHARD ANDREWS President and CEO, Azitra Inc., USA



MARIE DRAGO Founder, Gallinée, UK



6TH MICROBIOME R&D

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COMPOSITION OF THE MICROBIOME

- Exploring the concept of enterotypes
- · Population-level variation
- · Genetic determinants
- Early life & development
- · The effect of antibiotics

TOOLS & TECHNIQUES

- · Sequencing method development
- · Metagenomic data analysis
- · High-throughput culturing
- Stem cell technologies and tissue engineering – moving towards 3D models
- Gnotobiotics
- · Systems biology approach

GUT MICROBIOME & DISEASE

- Autoimmunity
- Metabolic functioning
- Inflammation
- Gut-brain axis
- Fecal microbiota transplants
- Case studies such as obesity, diabetes, IBD, colitis

MICROBIOTA & CANCER

- Identifying microbes associated with cancer
- · Host-microbe interactions
- Future directions

ROUNDTABLES

- · Metagenomic data analysis
- Investment & VC
- Academic industry collaboration
- Gut-brain axis
- · Therapeutics development

PROBIOTICS R&D

- Strain discovery
- Next generation microbial candidates
- Mechanisms of action
- Case studies in paediatrics, digestive health, metabolic diseases, aging, skin health, allergy

BUSINESS CONSIDERATIONS & REGULATION IN THE PROBIOTICS INDUSTRY

- Regulatory update
- · Commercialization strategies
- Marketing & consumer acceptance

- Barrier integrity
- Wound healing
- · Microbiome-based therapies for skin ailments
- Case studies such as atopic dermatitis, psoriasis, acne, allergy

COSMETIC

- · Where the market is; where it's going
- Best practices for commercialization
- · Microbiome-based therapies

PREBIOTICS & DIET

- The role of diet in shaping the microbiome
- Host-microbe interactions
- · The potential for prebiotics
- Human milk oligosaccharides (HMOs)
- Short chain fatty acids (SCFAs)
- Diet and disease
- · Mechanisms of action

PRODUCT DEVELOPMENT STRATEGY

- · Strain identification and screening
- Encapsulation and delivery methods
- Safety and QC

ROUNDTABLES

- Product formulation, storage & delivery
- Regulation
- Strain identification & screening
- VC & investment

COMPANY SHOWCASES

 Series of 15-minute presentations highlighting the work being done by some of the most exciting small- and medium-sized companies in the skin microbiome field

ROUNDTABLES

- · Formulating for the microbiome in beauty
- · Inter-organ axis for curative treatments
- Atopic dermatitis



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DRUG DEVELOPMENT STRATEGY

- Candidate selection and target validation
- Safety & toxicology studies
- Model optimization
- · Drug delivery methods
- Biomarker development
- Clinical trial strategy
- Manufacturing
- VC & investment
- Regulation

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Health Research, Personalised
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HERMAN VAN WIETMARSCHEN Researcher Integrative Medicine & Health, Louis Bolk Instituut



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Assistant Professor, Head of
the Microbiome Research Lab,
Azrieli Faculty of Medicine,
Bar-Ilan University, Israel



KATARZYNA HOOKS Postdoctoral researcher; LaBRI / CNRS, University of Bordeaux, France



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CosmosID



NIKOLE KIMESFounder, President & CSO, Siolta Therapeutics, USA



DIRK LÖFFERTCEO, Biomillenial SAS, France



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CAROLE SCHWINTNER Pharmaceutical Development Director, MaaT Pharma, France



HANSOO PARK CEO & CSO (Co-founder), Genome & Company



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Professor of Molecular Cell
Biology, University of Leiden,
The Netherlands



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University of Birmingham, UK



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ERIC DE LA FORTELLE Partner, Seventure Partners



CEES DE JONG Former CEO, Chr. Hansen, Denmark



LORENZA PUTIGNANI Head of Units of Parasitology and Human Microbiome Research, Bambino Gesù Children's Hospital, Italy



HELOISE BRETON Product Manager, Microbiome Product Development, DNA Genotek



CHRISTOPHER REYES (Chair) CSO and Founder, Bloom Science, USA

CONFIRMED PROBIOTICS SPEAKERS



JOHAN VAN HYLCKAMA VLIEG (Chair) Vice President Microbiome & Human Health Innovation, Chr. Hansen, Denmark



YOAV LIVNEY Associate Professor, Head, Lab of Biopolymers for Food & Health, Technion, Israel Institute of Technology



Science Manager, Yakult Nederland, Assistant Professor (0.2FTE), VU University Amsterdam

OLAF LARSEN



CARINE BLANCHARD R&D Specialist, Nestlé Research Center, Switzerland



BART SMIT Principal Scientist Fermentation, NIZO, The Netherlands



ANNICK MERCENIER CIO, Nutrileads, The Netherlands



BRUNO POT Research Group of Industrial Microbiology and Food Biotechnology, Faculty of Sciences and Bioengineering Sciences, Vrije Universiteit

Brussel, Belgium



SØREN KJÆRULF CEO, Lactobio, Denmark



GRÉGORY LAMBERT CEO & Vice President of R&D TargEDys SA, France



ADAM BAKER Head of Discovery -Microbiome and Human Health, Chr. Hansen, Denmark



JEAN-FRANÇOIS **BRUGÈRE** Associate Professor. Université Clermont Auvergne, France

WENDY DAHL



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MARIYA PETROVA Research Associate KU Leuven and University of Antwerp, Belgium; and Founder of Microbiome insights and **Probiotics Consultancy**



Associate Professor, Food Science and Human Nutrition, University of Florida, USA



PAUL DE VOS Full Professor of Immunology, **University Medical Center** Groningen, The Netherlands



CATHERINE DANIEL Group Leader in the Laboratory of Lactic Acid Bacteria and Mucosal Immunity, Center of Infection and Immunity, Institut Pasteur Lille, France



CAROLINE KURTZ Senior Vice President and Head of Metabolic Programs, Synlogic Inc., USA

Professor of Gut Microbiology,

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KOEN VENEMA



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HIMANSHU KUMAR Senior Scientist, Danone Nutricia Research, The Netherlands



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KIERAN TUOHYGroup Leader, Nutrition and Nutrigenomics, Fondazione Edmund Mach, Italy



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Groningen, The Netherlands



FIONA CRISPIE
Technologist, Teagasc Food
Research Centre and APC
Microbiome Ireland



YEMI ADESOKANCSO, Gnubiotics Sciences SA



ROB BEUDEKER (Chair) Investment Director, DSM Venturing



CAROLINE KURTZSenior Vice President and
Head of Metabolic Programs,
Synlogic Inc., USA

RANJAN KOIRALA

Department of Food, Environmental and Nutritional Sciences (DeFENS), University of Milan, Italy

CONFIRMED SKIN SPEAKERS



BERNHARD PAETZOLD
Co-Founder & Chief Scientific
Officer, S-Biomedic, Spain



ERIC HUANG

Chair Professor, National Central University, Taiwan; Adjunct Professor, Department of Dermatology, University of California, San Diego, USA



JULIE O'SULLIVAN

PhD Student, APC Microbiome Ireland, Teagasc Food Research Centre, Ireland



JACOB BAK HOLM

Director of Scientific Operations, Clinical Microbiomics



MARCELLINE GOYEN

(Chair) Skin Therapist & Gut Therapist, Editor for NTVH, The Netherlands



CATHERINE O'NEILL

Professor of Translation Dermatology, University of Manchester and CEO, SkinBiotherapeutics plc, UK



TODD KRUEGER

President and CEO, AOBiome Therapeutics, USA



GUUS KORTMAN

Scientist Microbiomics, NIZO, The Netherlands



ANNELEEN CORNELISSEN Head of Microbiology, Lysando AG, Germany



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Scientific Director, L'Oréal Advanced Research, France



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Chief Scientific Officer Yun (Probiotherapy) NV, Belgium



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Author & Founder, MyMicrobiome



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Founder, Gallinée, UK



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Founder and CEO, ELSI Skin Health



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Professor, Department of Cell and Molecular Biology, Karolinska Institute, Sweden



PETER JENS

CEO ANDBiopharma / Koppert Biologicals



JOHANNA GILLBRO

Co-founder and Chief Scientific Officer, Skinome Research AB, Sweden



ALEXANDER BUKO

Vice President for Pre-Clinical and Clinical Research and Development, Human Metabolome Technologies

STEFANIA ARIOLI

Post-Doctoral Researcher, Department of Food Environmental and Nutritional Sciences, University of Milan 08:00-09:00

Room: Shipping Hall

Registration & Refreshments



6TH MICROBIOME R&D & BUSINESS COLLABORATION FORUM

Room: Diamond Room I&II

MICROBIOME R&D AND BUSINESS COLLABORATION FORUM

Global Engage Welcome Address and Morning Chair's Opening Remarks: Christophe Lacroix, Professor, Laboratory of Food Biotechnology, Department of Health Sciences and Technology, ETH Zürich. Switzerland



KEYNOTE ADDRESS: KAREN NELSON

President, J. Craig Venter Institute, USA

Translation of the Microbiome: are we there yet
The past 12 years has presented several

significant studies and observations on the

human microbiome with great promise for new diagnostic and therapeutics. Many new companies have been founded in this field. Challenges that were evident in the earliest stages continue to plague the field. These include difficulties in comparing data sets from different studies; a focus on 16S gene analysis; lack of gene expression studies; limited data on host-microbe interactions; and lack of global studies. The promise still remains but as a community we need to figure out how to overcome these challenges in order to make the data from the human microbiome truly robust.



KEYNOTE ADDRESS:

DIRK HADRICH

Policy and Programme Officer, Health Research, Personalised Medicine, DG Research & Innovation, European Commission, Belgium

The collaborative efforts and research directions of European microbiome funding

EU has already funded 216 projects for more than € 498 M to promote metagenomics and to advance our knowledge on microbes. MetaHIT as one of the first projects had a catalysing effect with its produced catalogue of gut microbes and the proposed distinct 'enterotypes'. Many more projects followed but we see today that mechanisms, effects and causes are still not well understood so that research is now gathering all kind of data to complement patient information aiming to advance health and disease management. Three new projects will start in 2019 to find applications and to enhance knowledge on the microbiome, host metabolism, nutrition, immune responses, lifestyle and other interplaying confounders. They will focus on cancer, liver failure and autism.



3RD PROBIOTICS FORUM

Room: Penn Room I&II

PROBIOTICS CONGRESS

Global Engage Welcome Address and Morning Chair's Opening Remarks: Sylvie Morin, Director, Strategic Business Development, Lallemand



KEYNOTE ADDRESS: CARINE BLANCHARD

R&D Specialist, Nestlé Research Center, Switzerland

Prebiotic, probiotic, postbiotic: where do we stand and how to move forward?

Scientific evidence regarding the health benefits of prebiotic, probiotic and postbiotic supplementation have been mounting over the last five decades. However, consumer understanding of these discoveries has lagged behind, with interest rising in the last decade only. Despite clinically proven prebiotic effects with soluble fibers, observed disease prevention following supplementation with specific probiotic strains or the pre-clinical efficacy of microbial metabolite supplementation, the gap between the clear scientific evidence and consumer engagement is visible. In this session, three examples of these scientific investigations (with a prebiotic, probiotic and postbiotic respectively) will be discussed in the context of currently available science, products and consumer messaging.



KEYNOTE ADDRESS:

BRUNO POT

Research Group of Industrial Microbiology and Food Biotechnology, Faculty of Sciences and Bioengineering Sciences, Vrije Universiteit Brussel, Belgium

Shared responsibility for Industry, Regulators and Press: what to do to get the consumer correctly informed on probiotics?

The microbiota of the GIT participates actively in a tremendous number of live-critical processes and the inability to develop or maintain a satisfactory microbiota is increasing the incidence of chronic immune or metabolic dysfunctions later in live. The potential role of probiotics to positively impact this microbiota is being supported by numerous research observations, either in the lab or in the hospital. Numerous nutri-economic studies illustrate the positive impact probiotics may have on our society in terms of improving health and reducing healthcare costs. Still it is very difficult to obtain a formal recognition of probiotic benefits, either as a food or as a drug. The confusion of the consumer therefore



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Room: Mees Auditorium

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Global Engage Welcome Address and Morning Chair's Opening Remarks: William Baird Commercial Director, Global Engage



KEYNOTE ADDRESS: BERNHARD PAETZOLD

Co-Founder & Chief Scientific Officer S-Biomedic, Spain

Cutibacterium acnes the main component of the skin microbiota

 C. acnes is the main bacterial component of the skin microbiome on sebaceous and dry body sites (Byrd et al. 2018)

- Despite its dominant role on the skin many skin treatments aim at eradicating this bacterial species.
- I will present a selection examples of the literature why this bacteria is important to us and how it has a symbiontic relationship with its human host.



KEYNOTE ADDRESS:

ERIC HUANG

Chair Professor, National Central University, Taiwan; Adjunct Professor, Department of Dermatology, University of California, San Diego, USA

Skin Electro-biotic for microbiome banking

A commercial stool bank by collecting human gut microbiota is available in the market. Efforts from our group are devoted to establish a "Skin Microbiome Bank" for deveopment of novel skin probiotics and/or prebiotics. The microbes within a human microenvironment may compete with each other for the same carbon source of fermentation. Microbiome editing by targeting individual bacterial species in the microbiome using bacteria-specific carbon source is our strategy to restore a health-associated microbiome after dysbiosis. The conjugates of carbohydrates and polymers provide unique carbon sources (prebiotics) for specific skin probiotic bacteria. We demonstrate for the first time that skin bacteria can produce electricity via



6TH MICROBIOME R&D

Continued



3RD PROBIOTICS FORUM

remains high and contradictory reports in the media (both regular and social) make it very difficult for them to understand the benefits and limits of probiotics. Industry should keep investing in high quality research, regulators should define feasible criteria allowing recognition of these research efforts, and media should communicate in a realistic, non-skewed and balanced way on this research. Using a few recent examples the importance of each stakeholder involved will be illustrated.



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the bacterial fermentation. In this talk, the concept of probiotic-prebiotic-postbiotic-"electrobiotic" will be highlighted. Next-generation sequencing (NGS), although it is a new approach to biomarker identification, may not be able to dynamically detect the dysbiotic microbiome. We here demonstrate you the technology of "electrobiotic" for profiling and monitoring the skin dysbiosis in real time.

Room: Diamond Room I&II

EARLY LIFE DEVELOPMENT OF THE MICROBIOME

HERMAN VAN WIETMARSCHEN

Researcher Integrative Medicine & Health, Louis Bolk Instituut, The Netherlands



- The introduction of probiotics Ecologic AAD reduced antibiotics associated diarrhea by 16% in a Dutch elderly care institute.
- Participatory evaluation following implementation is a successful strategy for gaining insights in the effects of probiotics in daily elderly care practice.
- A process evaluation resulted in useful insights in facilitators and barriers to the implementation process.

Room: Mees Auditorium

MICROBIOME & SKIN AILME

ALEXANDER BUKO

Vice President for Pre-Clinical and Clinical Research and Development, Human Metabolome Technologies Novel Technologies for Understanding Metabolomic Communications between Host and Microbiota



- Capillary Electrophoresis Mass Spectrometry (CE-MS) offers higher resolution than LC-MS.
- CE-MS measures greater number of SCFAs and resolves branched and unbranched SCFAs to measure enzymatic specificity.
- HMT provides an extra-large metabolomic space that can be connected to 16S rRNA sequencing for understanding microbiota pathways.

10:40-11:50

Room: Shipping Hall

Morning Refreshments / One-to-One Meetings / Even Numbered Poster Presentations

EARLY LIFE DEVELOPMENT OF THE MICROBIOME

Room: Diamond Room I&II

EARLY LIFE DEVELOPMENT OF THE MICROBIOME

Room: Penn Room I&II

OMRY KOREN Assistant Professor, Head of the Microbiome Research Lab, Azrieli Faculty of Medicine, Bar-Ilan University, Israel A microbiome is born: changes to the gut microbiome in pregnancy and infancy

 Pregnancy progression is associated with dramatic alterations in the composition of the gut microbiota.

- The gut microbiota of pregnant women is characterized with a decrease in bacterial diversity which is accompanied by an increase in "between sample" diversity and an increase in the relative abundance of Proteobacteria and opportunistic pathogens.
- Germfree mice inoculated with gut microbiota from pregnant women presented metabolic changes mirroring those of the pregnant women.
- We are now at the point of trying to understand whether these changes in community structure are a cause or consequence of some of the characteristics of pregnancy.



ADAM BAKER

Head of Discovery - Microbiome and Human Health, Chr. Hansen, Denmark

Innovating in probiotics during the microbiome era. From screening to clinical development

- Screening in vitro and ex vivo to elucidate mechanisms of microbe-host interaction.
- The microbiome as a source of probiotics and live bacterial therapeutics
- Scientific and technical challenges in developing next generation probiotics

MICROBIOME & SKIN All MENT

Room: Mees Auditorium

ASSAF ORON

Chief Business Officer, BiomX, Israel

Novel topical phage therapy for treating acne

BX001 is a topical gel of a phage cocktail

comprised of natural phage capable of eradicating P. acnes, a main cause for acne

disease. BX001 has demonstrated high efficacy in eradication of antibiotic resistant P. acnes strains and breakdown of biofilm. Under this talk we will share results from pre-clinical development activities and challenges in manufacturing and formulation towards entry into clinical trials expected H1 2019.

LESLEY HOYLES

Associate Professor in Microbiology Nottingham Trent University, UK

Understanding the role of the gut microbiome in non-alcoholic fatty liver disease Non-alcoholic fatty liver disease (NAFLD) is

the most common cause of chronic liver disease worldwide, with incident rates of 20-30 % in western countries and 5-18 % in Asia and closely linked to the global obesity epidemic. Recent work has shown perturbation of the microbiome and specific microbiome-associated metabolites contribute to the phenotype of NAFLD. This talk will present findings from recent integrated systems biology studies examining the role of the microbiome in NAFLD, highlighting potential new biomarkers for the disease and areas that require further study.



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YEMI ADESOKAN

CSO, Gnubiotics Sciences SA Selective Microbiome Modulation by Microbiota Accessible Carbohydrates

Tools for monitoring efficacy



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INGMAR CLAES

Chief Scientific Officer, Yun (Probiotherapy) NV, Belgium

The use of 'live' beneficial lactobacilli to treat skin conditions

YUN is a Belgian biotech company that succeeded in building an innovative and unique R&D platform and technology, allowing to keep bacteria alive in water-based environments. Use of live beneficial lactobacilli provides an antibiotics alternative by impacting the skin microbiome. Specifically for acne vulgaris YUN developed a formulation with microencapsulated live bacteria for the treatment of acne. Besides the impact on the skin microbiome and reduction of specific skin pathobionts linked with acne vulgaris, clinical symptoms of all patients with mild to moderate acne improved in our clinical trial. The improvement in clinical symptoms of acne is further underlined by a post-market follow up study. With our current data, YUN believes this will initiate a new era of skin therapeutics based on microbiome modulation, and provides a new therapeutic option to reduce antibiotic use for common skin conditions, like acne.



EARLY CAREER RESEARCHER PRESENTATION:

KATARZYNA HOOKS

Postdoctoral researcher; LaBRI / CNRS, University of Bordeaux, France

Challenges of collaborative interdisciplinary microbiome projects

Microbiota studies rely on metagenomic sequencing and are highly technology-driven, thus require heavy bioinformatics support. Incorporating patient samples adds another layer of complexity. Clinical microbiomics is best approached through consortia involving multiple specialities, including medical doctors, microbiologists and bioinformaticians. Opportunities to form such interdisciplinary collaborations among scientists and clinicians are becoming more frequent, as funding agencies and research institutions are both actively encouraging them. I will discuss the challenges we faced in Bordeaux during collaborative work between researchers and doctors interested in the intestinal microbiota of cystic fibrosis patients. I will introduce the scientific and practical context of the study, the difficulties and the strategies that were adopted to progress the project, and the final results. Upon termination of the study, the benefits and pitfalls of the collaboration were clear, and this has allowed us to generate recommendations for other teams attempting to initiate clinical microbiome projects.



EARLY CAREER RESEARCHER PRESENTATION: **MARIYA PETROVA**

Research Associate KU Leuven and University of Antwerp, Belgium; and Founder of Microbiome insights and Probiotics Consultancy

Lactobacillus rhamnosus GR-1 - the best studied vaginal probiotic strain

Lactobacillus rhamnosus GR-1 (LGR-1), originally isolated from a female urethra, is one of the most widely used probiotic strains. Various health effects are well documented with the best-known use in the treatment of bacterial vaginosis. Recently the complete genome sequence of LGR-1 was determined and compared to L. rhamnosus GG and L. rhamnosus LC705 at the genomic and phenotypic level. A key difference is an absence in LGR-1 of the spaCBA locus required for pili-mediated intestinal epithelial adhesion. The LGR-1 genome contains a unique cluster for EPS production, which synthesize glucose-rich, rhamnose-lacking molecules. Only few cell-wall molecules were yet identified as essential factors governing host-microbe interactions. Such an example is the LGR-1 lectin-like protein 1 involved in tissue tropism-mediated adhesion to vaginal epithelial cells and immunomodulation.



EARLY CAREER RESEARCHER PRESENTATION: **JULIE O'SULLIVAN**

PhD Student, APC Microbiome Ireland, Teagasc Food Research Centre, Ireland

Antimicrobial potential of the skin microbiome

The human skin microbiome naturally harbours hundreds of diverse bacterial species which represent part of the body's first line of defence against the outside world. This commensal microbiota contributes to host health and is thought to be involved in the protection of the host against a range of infections. In this respect, the production of antimicrobial compounds is likely to be one of the defence mechanisms of the host microbiota. With the increase in antibiotic resistance, alternative antimicrobial therapies such as bacteriocins are being investigated. This study was undertaken to isolate and characterise novel bacteriocin-producing bacteria populating the human skin surface.



6TH MICROBIOME R&D



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Room: Diamond Room I&II



ARNE MATERNA

Vice President of Product, CosmosID

COSMOSID'

Shotgun Metagenomics & Strain-Level Analysis: Study Design for Microbiome R&D

The emergence of Next-Generation Sequencing has changed the level of resolution that industry and academia can study the microbiome. As the industry transitions from 16S to Metagenomics, CosmosID is leveraging 10 years of R&D to educate and address

the importance of standardization and reproducibility in metagenomics studies. This presentation will outline the various applications of of shotgun metagenomics at every step of the product development workflow; from early discovery through to clinical development and manufacturing QC. CosmosID will also present data on the impact that different read-depths and lab methodologies can impact bioinformatics analysis along with recommendations on how to approach such studies.

Room: Mees Auditorium

JACOB BAK HOLM



Director of Scientific Operations, Clinical Microbiomics Skin microbiome pipeline with strain level resolution

At Clinical Microbiomics we offer full-service microbiome analysis of skin samples. This includes a skin-dedicated metagenomics pipeline with optimized DNA extractions, shotgun sequencing, and data analysis to maximize

data quality and insights to the skin microbiome. Here we present our skin microbiome platform, which is built on data from almost 2,000 shotgun sequenced skin samples from multiple body sites allowing premium taxonomical and functional resolution. Using SNV-based analysis we are able to identify, discriminate and track strains and sub-species populations from skin microbiome data.

13:25-14:25 Room: Shipping Hall Lunch / One-to-One Meetings

SPONSORED BY:



Room: Diamond Room I&II

THE GUT MICROBIOME & DISEASE

Session Chair: Yemi Adesokan, CSO, Gnubiotics Sciences SA

Room: Penn Room I&II

PROBIOTICS R&D

Session Chair: Hermie Harmsen, Associate Professor, Department of Medical Microbiology, University Medical Center Groningen, The Netherlands

MARKUS LEHTINEN

Principal Scientist, DuPont Nutrition & Health, Finland

Probiotics and nasal microbiota in respiratory tract infections

Traditionally, probiotic research has been

focusing on the intestinal microbiota and gut health. With emerging research data, there has been an increasing interest and rationale in looking beyond the intestinal microbiota, especially when investigating extra-intestinal health effects of probiotics. In the context of upper respiratory tract infections, the nasal microbiota plays an important role in modulating the mucosal immune responses to viral infections. We have investigated in a clinical trial the impact of probiotic Bifidobacterium lactis BI-04 supplementation on the intestinal and respiratory tract microbiota and on the course of rhinovirus infection. Microbiota composition, immune response and clinical data will be discussed.

Room: Mees Auditorium

Session Chair: Marcelline Goven, Skin Therapist & Gut Therapist. Editor for NTVH, The Netherlands



CATHERINE O'NEILL

Professor of Translation Dermatology, University of Manchester and CEO, SkinBiotherapeutics plc, UK

The gut-skin axis

Probiotics are defined as 'live micro-

organisms, which when administered in adequate amounts. provide a health benefit on the host'. To date most organisms defined as 'probiotic' are members of the gut microbiota, e.g. species of Lactobacillus. There is increasing evidence that lactobaciili are useful for the treatment/prevention of a variety of conditions of the gut. Recently, it has become popular to include lactobacilli in topical formulations. Although in this context they cannot be considered 'probiotic', lactobacilli do have enormous capacity to change the physiology of the skin. In this talk, I will review the data supporting their use and describe the work my group does developing lactobacilli as novel therapies for skin.

MICROBIOME COMPANY SHOWCASES:

Short presentations from some of the most exciting small and medium-sized companies in the industry



14:25-14:45 **NIKOLE KIMES**

Founder, President & CSO, Siolta Therapeutics, USA

Translating the Promise of the Microbiome through the Development of Live **Biotherapeutic Products**

- The developing gut microbiome and allergic disease
- Translating academic research into clinical trials
- Embracing the potential for prevention



14:45-15:05 **JAMES MCILROY**

Founder, EnteroBiotix, UK

Using whole community microbiome transfer to develop novel medicinal products

· Establishing a fully-integrated, GMP-compliant and MHRA licensed microbiota manufacturing platform.

- Applicability of FMT in disease indications beyond C.difficile infection
- Combining faecal microbiota with precision antimicrobials to create an entirely novel class of medicinal product

MICROBIOME AND PROBIOTICS SERIES: EUROPE 2019



Sourcing Novel Microbes for Product Development from the Vast Space of Microbial Dark Matter

The human microbiota is a complex community of microbes that play a prominent role in health and well-being. An imbalance of the microbiota (dysbiosis) has been found to strongly impact certain lifestyle diseases, such as diabetes, obesity and allergy, as well as oncology, intestinal tract diseases, depression and autism. Biomillenia's approach is able to rapidly identify previously undiscovered microbes, providing a more comprehensive understanding of the mechanisms influencing the human microbiota. The Biomillenia technology platform is used to culture and perform functional analysis of microbes in low volume droplets using proprietary lab-on-a-chip technology with the ultimate goal of building the world's largest microbial culture collection from samples taken from animals, plants, humans and or from soil and sea water. The Company's unique approach is able to maintain a higher diversity of living microbes than standard microbiology methods.



3RD PROBIOTICS FORUM



YOAV LIVNEY

Associate Professor, Head, Lab of Biopolymers for Food & Health, Technion, Israel Institute of Technology

Novel Biopolymeric Vehicles for Targeted **Delivery to Gut Probiotics**

Maintaining a healthy proportion of probiotic bacteria in our colon is imperative to our health. Probiotic bacteria need amino acids, which are scare in the colon. No existing prebiotic product contains protein. We developed a novel biopolymeric vehicle for selective targeted delivery of peptides to probiotic bacteria in the colon, for enhancing their competitive advantage over undesired microorganisms. The vehicle is composed of conjugates of galacto-oligosaccharides (GOS) and lactoferrin, pre-digested by pepsin (LFH). We found that most of the protein in the Maillard conjugates survived digestion, hence would reach the colon, and be used by the probiotics. The growth rate of the probiotic L. casei on the conjugates was double that on the unconjugated components. This study introduces the next-generation of prebiotics: peptide/protein containing prebiotics.

FORTEBIO



SKIN MICROBIOME & COSMECEUTICALS CONGRESS

MAYA IVANJESKU

Chief Scientific Officer - LaFlore Probiotic Skincare, USA

Lysates vs Live Probiotic cultures in skincarewhat are the benefits and differences?

Numerous skincare brands incorporate

lysates in their formulas and few brands were able to harness live and active bacteria in addition to the lysates. Neither is an easy task when it comes to formulation however, we can all acknowledge and appreciate the difficulty in working with live probiotics. So, what are the benefits and is this extra challenge worth the effort? There are numerous views and opinions on this topic but the bottom line is: are there any differences using lysates vs live and active probiotic cultures when it comes to skin treatment products that are driven by the results.

Room: Diamond Room I&II



JOSIPA DRAGUN

Field Application Scientist, FortéBio

Synthetic Metagenomics: The Next Big Step Converting **Digital Information Back to Useful Biology**

Next-generation sequencing technologies have resulted in the identification of millions of novel predicted genes which cover the full spectrum of known pathways

and functional activities. These include large numbers of novel biocatalysts for potential applications in energy and environmental technologies, and potential uses in basic research and applied biotechnology. A major challenge is converting the vast amount of digital information to observable, functional biology such as enzyme activity or protein expression. Due to the variety of organisms in any given microbiome, studies can benefit greatly from flexibility, throughout and true walk-away operation of an automated microbial colony picking system. The talk presents an example, how the QPix system offers streamlined control and management of complex and iterative processes.





Scientist Microbiomics, NIZO, The Netherlands In vitro microbiota models for gut, skin and women's health

Room: Mees Auditorium



NIZO has developed in vitro high-throughput screening technologies for assessment of microbiota modulators on the gut, skin and vaginal microbiota. With our MicroColon technology we can screen modulator effects on both infant and

adult fecal microbiota, using fresh fecal samples as inoculum for the fermentation. By using organic acid analysis and microbiome profiling (next-generation sequencing and bioinformatics analysis, and qPCR) as readouts, the most promising ingredients (e.g. HMOs, probiotics, prebiotics, fibers, etc.) can be selected. Our MicroSkin model contains human callus as the main nutrient source, providing a much more relevant biological skin matrix compared to traditional/defined culture media, Typically, the high-throughput MicroSkin model can contain single strains of which we have tested up to 20 skin isolates and on which we can test growth promotion or inhibition of compounds (e.g. prebiotics, extracts, lysates, etc.), as well as effects on strain metabolism. With our newest in vitro microbiota screenings technology we now also offer assessment of potential modulators for the vaginal microbiota. This model contains a culture medium simulating the women's genital tract environment, inoculated with vaginal microbiota swabs. By microbiome profiling effects of potential modulators on the vaginal microbiome composition can be assessed.



6TH MICROBIOME R&D & BUSINESS COLLABORATION FORUM



3RD PROBIOTICS FORUM



SKIN MICROBIOME & COSMECEUTICALS CONGRESS

MORTEN L. ISAKSEN

Founder & CEO, Bio-Me

High-resolution, rapid microbiome analysis as a tool in **Precision Medicine**

With the need for rapid detailed analysis in routine microbiome analysis, Bio-Me has developed the Precision Microbiome Profiling (PMP) platform. PMP offers

analysis of hundreds of samples in less than a day for a panel of 50 - 200 different bacterial species, providing direct quantification of number of genomes in the sample. Some data from applications of the technology in an intervention study will be presented. Among other things, considerable daily variations at species level was observed. This may have implication on future design of intervention studies and aid in better microbiome analysis as an important tool in Precision Medicine.



ANNELEEN CORNELISSEN

Head of Microbiology, Lysando AG, Germany

Artilysin® - Ingenious Targeted Restoration of the Microbiome The Lysando AG is a Biotech company founded in 2009 focusing on a new and innovative antibacterial technology platform, Artilysin®, Artilysin®s designed by the

modification of endolysins, are able to pass the outer membrane of gram-negative bacteria and exhibit an increased affinity towards the gram-positive cell-wall. Their destabilisation of the bacterial cell wall bursts the cells within only fractions of a second. Furthermore, Artilysin® are quickly biodegradable, non-toxic, stable against resistance development and cause no negative side effects. As a platform technology, Artilysin®s can target nearly every bacterial species and can be specifically designed to eliminate only the target bacteria without harming the beneficial microflora. The targeted modulation of the microbiome in combination with its unique overall characteristics make Artilysin°s the perfect instrument in the restoration of a healthy and balanced microbiome.

15:55-16:45

Room: Shipping Hall

Afternoon Refreshments / One-to-One Meetings / Odd-Numbered Poster Presentations

Room: Diamond Room I&II

THE GUT MICROBIOME & DISEASE

HERMAN SPAINK

Professor of Molecular Cell Biology, University of Leiden, The Netherlands

New tools for high throughput functional microbiomics

The last years several new technological advances have speeded up the identification of functional traits of microbes that confer beneficial effects on the host. For instance new sequencing technologies make it possible to quickly get insights in the composition and functionalities of complex microbiomes based on metagenomics. We have used a combination of Oxford Nanopore and Illumina sequencing technologies to obtain metagenomics data that can accurately show the identity of the majority of microbes in complex microbiomes. In addition, gnotobiotic animal test models have been developed using zebrafish larvae that can identify functional traits of microbiomes at high throughput. Especially with respect to the effects of the microbiome on the host innate immune system the larval screens are useful for human microbiome diagnostics.

Room: Penn Room I&II

Bio-Me

PROBIOTICS CONGRESS



BART SMIT Principal Scientist Fermentation, NIZO, The Netherlands

Culturing and Scale up of Live Biotherapeutic Products & probiotics

At this moment new Live Biotherapeutic Products (LBP) with applications in several disease areas such as Metabolic diseases, Cancer, Dematology and CNS, are under fast development. One may not only think of strains belonging to the group of Lactobacilli and Bifidobacteria, but also Eubacteria. Akkermansia, Propionibacteria, Clostridiaceae, Blautiaceae, Faecalibacteria, etc. Growing, processing and formulation of these bacteria on production scale is very species and strain dependent and poses a range of challenges. Therefore optimization of the economics of the LBPs/probiotics plays in an ever more important role in the commercialization process.

Room: Mees Auditorium



TODD KRUEGER

President and CEO, AOBiome Therapeutics, USA What I Wish I Knew: Lessons From the Petri Dish

AOBiome's proprietary product candidates harness a single strain of class-defining,

auto-regulating, Ammonia Oxidizing Bacteria, or AOB, a human commensal that produces well-understood and well-characterized biochemical compounds that are critical to human health. We believe that the application of AOB has the potential to restore critical biological and biochemical processes through the symbiotic relationship between humans and these naturally-existing bacteria to address significant clinical need at various stages of inflammatory conditions such as acne vulgaris or acne, atopic dermatitis or eczema, rosacea, allergic rhinitis and migraine.





HUGO ROUME

Operational Manager of Quantitative Metagenomic Sequencing Platform, MetaGenoPolis Unit, INRA, France

A rapid and precise approach for gut microbiota analysis using nanopore

technology in shotgun metagenomics sequencing

Gut microbiota constitutes an ecosystem of major interest for the biomedical field. However, despite their importance, only a fraction of the thousands of different microbial species is known and has sequenced genomes. This is mainly due to the difficulties of cultivating microbes from natural systems in the laboratory. The current alternative approach is to retrieve individual microbial genomes from complex samples upon shotgun short-read sequencing (approx. 150 bp) combined with metagenomics assembly and differential coverage binning approaches. However, retrieving individual bacterial genomes from complex microbial communities using short reads is challenging time consuming and only partially successful, due to the presence of repeated regions in bacterial genomes hampering assemblies and closely related strains/species in complex ecosystems. In this talk, we will share our experience in using high-throughput long-read data from Oxford Nanopore in combination with short Ion Proton reads to recover genomes from human intestinal samples. We shall also demonstrate rapid characterization of human gut microbiome composition, using exclusively Oxford Nanopore long reads. Such characterisation is central for biomarker discovery.



KAROLINE FAUST

Assistant Professor, Department of Microbiology and Immunology, KU Leuven, Belgium

Insights from synthetic gut communities We need to better understand community dynamics in order to manipulate human gut

microbiota. Such an understanding can be encoded in models, which can quantify community stability and investigate the effects of perturbations. However, a large number of basic parameters is still unknown, including pH and nutrient preferences of gut microorganisms, their interactions among themselves and with the host. Human gut communities consist of hundreds of species, which are living and evolving in a spatially structured environment. It is currently not clear which of several modeling strategies is the most promising. Synthetic gut communities grown in wellcontrolled conditions allow addressing some of these issues. We need to go beyond the few existing synthetic community studies to address the challenges of gut microbial community modeling.



3RD PROBIOTICS FORUM

PROBIOTICS & PREBIOTICS COMPANY SHOWCASES:

Short presentations from some of the most exciting small and medium-sized companies in the industry



17:10-17:30

SØREN KJÆRULF

CEO, Lactobio, Denmark

New probiotic strains with functional properties

 Lactobio has built a proprietary discovery and screening platform that identify the best probiotic strains to target microbiome dysfunctions associated with specific diseases.

- Humans have spent the last 80 years trying to clean "germs" from our homes and bodies. The use of antibiotics to fight infections have saved countless numbers of lives, but with unintended consequences to our microbiomes that we are only beginning to understand. Lactobio has developed several lactic acid bacteria with activity against multi-resistant bacteria.
- In Lactobio we focus on creation of new microbial solutions based on probiotics, we work with the gut, oral, skin and vaginal microbiota to create new products targeted to specific needs.



17:30-17:50

IRINI LAZOU AHRÉN

Senior Scientist, Probi

Probi® Osteo protects against lumbar spine bone loss in healthy early postmenopausal women

Probi® Osteo offers a new, innovative and preventive solution to support bone health and healthy ageing. In a recently conducted clinical study Probi®Osteo, a combination of three probiotic strains from Probi, was shown to significantly reduce the bone loss at lumbar spine, as compared to placebo. This double blind, placebo controlled randomized study with 250 postmenopausal women, is the biggest ever study with probiotics conducted in this field.



17:50-18:10

ANNICK MERCENIER

CIO. Nutrileads. The Netherlands

NL-01, a novel carrot derived polysaccharide

modulating immunity and gut microbiota

NutriLeads has identified that an active polysaccharide motive can be extracted from crops and deliver immune stimulating properties similar to those reported for ginseng extracts thus providing a solution for critical cost and sourcing issues related to ginseng derived functional ingredients. Preclinical work



SKIN MICROBIOME & COSMECEUTICALS CONGRESS

CROSS EVENT ROUNDTABLE DISCUSSIONS:

Roundtables are informal, small-group interactive discussions on key topics in the field. Discussion leaders will introduce sub-topics/questions for discussion and roundtable attendees are encouraged to participate actively in the session.



Table 1: Harnessing the gut-skin-brain axis microbiome in health and disease

LIONEL BRETON

Scientific Director, L'Oréal Advanced Research, France

As crucial interface organs, the gut, brain and skin have much in common. Emerging research has shown that skin microbiota may play a critical role at the interface of all three organs. Therefore, it is not surprising that conditions affecting one organ's microbiota may also have manifestations in the two others. More importantly, a better understanding of the intestinal microflora and its subsequent relationship with our skin may provide new insights into developing unique product candidates that will accurately treat a spectrum of skin disease indications with current unmet needs. As the microbiome continues to enter the scientific mainstream, this multiple complexity organ is largely unexplored so join this unique workshop to discuss new translational approaches, advanced clinical links and the route to commercially viable therapeutics.



Table 2: Are live probiotic cultures safe to be used on skin?

MAYA IVANJESKU

Chief Scientific Officer - LaFlore Probiotic Skincare, USA

- What are the strains of live probiotics used on skin
- Opinion in using topical application that contains live and probiotic cultures
- What studies should be done to show safety and efficacy of live and active cultures



Table 3: Gut Microbiota and Antibiotic Resistance

IVANA HALUSKOVA BALTER

Independent consultant, Science for health partnership and preventive medicine, French Society of Immunology

- AR Genes transfer
- Clostridium infection and microbiota after ATB treatment
- ATB effect gut/lung axis





3RD PROBIOTICS FORUM

showed that this extract stimulates especially the innate arm of the immune system, leading to protection against Salmonella infection in mice. This immune effect was confirmed in a PoC trial in healthy adults and led to design further clinical trials aiming at demonstrating protection against respiratory infections. The mouse study and in vitro faecal fermentation experiments also demonstrated that RG-I crop derived pectic polysaccharides are definitively modulating the gut microbiota and this was again confirmed in the human situation.



SKIN MICROBIOME & COSMECEUTICALS CONGRESS



Table 4: Investment & VC ERIC DE LA FORTELLE

Partner, Seventure Partners Since the early days of pioneer startups in 2010-

2015, the field of microbiome has developed, expanded and got more diverse and sophisticated. The pioneers concentrated mostly on (i) full microbiota transfer (Rebiotix) or extracts therefrom (Seres), (ii) LBP cocktails (Vedanta), and pharmacological interventions in microbiome biology (Second Genome, Enterome). Now, while the first generation is engaged in phase 2 and phase 3 clinical studies, new generations of companies are developing more products on those categories, adding to the initial technologies and to the indication space.

This roundtable will discuss:

- What are the most promising 'new indications' emerging (oncology, CNS, others). Is an 'inflexion point' coming in terms of clinical data, IPO, quantity of private capital available for early-stage funding rounds
- Is there still a risk of 'backlash after hype' in the field of microbiome which should keep investors prudent

Continued

Chair's Closing Remarks / End of Day One

18:10-19:10

Room: Shipping Hall

Networking Drinks Reception

08:00-09:00

Room: Shipping Hall

Refreshments



6TH MICROBIOME R&D & BUSINESS COLLABORATION FORUM

Room: Diamond Room I&II

THE MICROBIOME AND IMMUNITY

Session Chair: Momo Vuyisich, Chief Science Officer, Viome, USA



GER RIJKERS

Professor in the Biomedical and Life Sciences University College Roosevelt, The Netherlands Antibiotics and probiotics: balancing gut microbiota during treatment for infectious

- A well balanced gut microbiota is essential for maintenance of health.
- Antibiotics are powerful drugs for treatment of infectious diseases.
- Diarrhea is a common side effect of antibiotic therapy, and is most frequently associated with the use of broad spectrum antibiotics.
- Selected strains of probiotics, either single strain or consortia, reduce the incidence and severity of antibiotic-associated diarrhea.
- Lactobacillus rhamnosus GG has been studied most and shows a relative risk reduction of 0.30 (95% CI 0.16–0.55).
- Clear communication to consumers, patients, and health care professionals now is needed for optimal implementation in practice.



3RD PROBIOTICS FORUM

Room: Penn Room I&II

PROBIOTICS R&D

Session Chair: Carine Blanchard, R&D Specialist, Nestlé Research Center. Switzerland



JEAN-FRANÇOIS BRUGÈRE

Associate Professor, Université Clermont Auvergne, France

Time to consider Archaea as pharmabiotics for cardiovascular disease and more Archaea are not bacteria nor eukaryotes.

but microorganisms fundamentally different that possess some unique features. No pathogen has been described so far as well for humans, animals or plants. Some of them are consistently retrieved within most human- and animal-associated microbiota, sometimes at elevated levels. Considering the genetic and metabolic specificities of some of them, encompassing those of humans-hosted archaea, these microorganisms seem to be appropriate and even unique for some applications in humans. Tackling intestinal TMA, a product of intestinal bacteria metabolism that leads to the atherogenic plasma compound TMAO provides an example of their usefulness in cardiovascular disease prevention. All of this contributes to propose that it is time to consider archaea as a



SKIN MICROBIOME & COSMECEUTICALS CONGRESS

Room: Mees Auditorium

COSMECEUTICALS

Session Chair: Lionel Breton, Scientific Director, L'Oréal Advanced Research, France



KEYNOTE ADDRESS: AUDREY GUENICHE

Senior Clinical Expert, Advanced Research L'Oréal Research & Innovation, France A specific skin care prebiotic cream for skin microbiome recovery after skin aggression

Face cleansing is an important daily gesture that allows oils, dirt, sebum to be washed from the skin. However, whereas mild cleanser is recommending, cleansing using soap can diffuse into the stratum corneum layer of the skin and disturb ordered lipid and cellular structures might be detrimental also for microbiota. On 30 volunteers, clinical expert evaluation and self-assessment revealed that soap cleansing increases dryness, roughness and discomfort and these skin alterations do not recover during the day. This soap wash decreased the quantity, the bacterial richness and evenness (alpha diversity) and changed the bacterial communities (beta diversity) that did not recover during the day. One application of a specific skin cream helps to restore bacterial alpha diversity and decrease tightness. Very interestingly, 15 days' cream application allows the skin and bacteria community to better resist against aggression and to guickly completely recover post cleansing. All these important findings show that it is important to propose a skin routine that will firstly clean by respecting the diversity of skin microbiota and, secondly, will feed the skin microbiota and facilitate its recovery. The specific prebiotic formula, in vivo, and is very useful to preserve skin and microbiome quality.



EVELINA MUNUKKA

Research Director, Faculty of Medicine University of Turku, Finland

MAPPAC (Microbiology Appendicitis Acuta) trial: Acute appendicitis and microbiota -etiology and effects of the antimicrobial treatment

Still to date, appendectomy is the most common emergency abdominal surgery, and has traditionally been the standard treatment for acute appendicitis. The appendicitis treatment with antibiotics (ABs) has been tested in various RCTs lately. Recently,



CAROLINE KURTZ

reservoir of workable next-generation pharmabiotics.

Senior Vice President and Head of Metabolic Programs, Synlogic Inc., USA

Synthetic Biotic Medicines for the Treatment of Rare Inborn Errors of Metabolism and Metabolic Disease

This talk will describe the design, preclinical data and early clinical data for two distinct synthetic biotic strains engineered from E. coli Nissle for the treatment of hyperammonemia disorders and for phenylketonuria respectively.



MARIE DRAGO

Founder, Gallinée, UK
Scalp Microbiome - The next big shift in beauty

Skin microbiome is the biggest rend in beauty, but what about the scalp microbiome?

Still relatively unknown, it could lead to a new generation of products and a radical change in habits for customers. In this presentation, we will present what we currently understand on the scalp microbiome, and its consequences for the beauty industry.

Finnish multicenter APPAC trial (n=530) compared the AB therapy with appendectomy in the treatment of uncomplicated acute appendicitis. Results showed that over 70 % of patients were successfully treated with ABs alone (Salminen et al. 2015, JAMA). Despite the knowledge that uncomplicated acute appendicitis is treatable by ABs the role of the gut microbiota (GM) in the pathogenesis and etiology of appendicitis have not been clarified yet. Further, there is only limited amount of evidence on the appendix microbial composition in humans. Currently MAPPAC trial, a microbiological continuum to APPAC, aims to

evaluate the possible role and differences in the microbiological etiology of complicated and uncomplicated appendicitis.



3RD PROBIOTICS FORUM



SKIN MICROBIOME & COSMECEUTICALS CONGRESS

Continued

Continued

Room: Diamond Room I&II



SOLUTION PROVIDER PRESENTATION:

studies highlight the power of untargeted metabolomics to identify phenotype-mediating and



Director of Research and Development, Metabolon

Untargeted Metabolomics in Feces, a Functional Readout of Gut Microbial Activity There is an established link between microbiome composition and host

phenotype. Microbiome sequencing efforts capture the composition of the microbial species, but do not provide the mechanism by which those microbes affect the host. The analysis of fecal material using untargeted metabolomics provides that link, as it can identify the metabolites that mediate the host microbe interaction. An overview of untargeted metabolomics technology and two recent studies that combined metagenomic sequencing with untargeted metabolomics will be highlighted: first, a study which identified biomarkers for patient responders to checkpoint inhibitor therapy in metastatic melanoma patients and second, where a metabolitebased intervention strategy was identified which ameliorated post-dieting weight gain. These

Room: Mees Auditorium



WENDY DAHL



Associate Professor, Food Science and Human Nutrition, University

A randomized, double-blind trial of Bifidobacterium animalis ssp. lactis B94 on gastrointestinal outcomes in adults with Prader-Willi syndrome

Meta-analysis data support the efficacy of Bifidobacterium animalis ssp. lactis strains for normalizing stool frequency and form in adults with functional constipation. However, the efficacy of B. lactis strains in managing constipation and related gastrointestinal symptoms common in many patient populations requires investigation. Constipation in adults with the genetic disorder, Prader-Willi syndrome, is thought to be due to motility issues and a restrictive diet. The aim of this study was to determine the effect of daily consumption of Bifidobacterium animalis ssp. lactis B94 on gastrointestinal function, symptoms, and microbiota in adults with PWS. Participants (n=25; 15F:10M) completed a 20week randomized, placebo-controlled, crossover study, receiving 15 billion CFU of B, lactis B94 or placebo each for 4 weeks, preceded by a 4-week baseline and followed by 4-week washouts. Daily questionnaires provided records of stool frequency and stool form. Stools per period were collected for strain viability and exploratory microbiota analysis. Dietary intake by 7-day food records was also collected. Preliminary data analyses suggest that adults with Prader-Willi syndrome consuming a low energy and low fiber diet, may have attenuated discomfort with gastrointestinal dysfunction. Further analyses is underway to explore the specific effects of B. lactis B94 and the microbiome profile of this patient population.

Room: Shipping Hall

actionable discoveries of microbial action.

Morning Refreshments / One-to-One Meetings / Odd-Numbered Poster Presentations

6TH MICROBIOME R&D & BUSINESS COLLABORATION FORUM



3RD PROBIOTICS FORUM



SKIN MICROBIOME & COSMECEUTICALS CONGRESS

Room: Diamond Room I&II

GUT MICROBIOME AND DISEASE

PRESENTATION: **HANSOO PARK**

CEO & CSO (Co-founder), Genome & Company

30 MINUTE SOLUTION PROVIDER



The gut microbiome of cancer patients has recently been highlighted as a critical factor for cancer therapy. Although several gut bacterial species have been suggested as onco-probiotics, the multi-omic characteristics of anti-tumor bacteria strains have not been fully clarified. Genome & Company provide an additional dimension to bacterial strain-specific determination of cancer therapeutics efficacy, by integrating metagenome, bacterial whole genome/transcriptome, mouse intestinal transcriptome/serum metabolome data.

Room: Mees Auditorium

KRISTIN NEUMANN

Author & Founder, MyMicrobiome



MyMicrobiome.info teaches the public comprehensively about the microbiome. In doing so, we make sure that we transmit scientific facts easily understandable to a broad audience. Thus, we are the only microbiome information platform that

makes the topic accessible to the general public. One mission of MyMicrobiome is to scrutinize products for the microbiome and inform the public about products which are scientifically proven to be beneficial for the microbiome. In this context MyMicrobiome.info developed a Microbiome Quality Standard which classifies cosmetic products as "Microbiome-friendly". Cosmetic products are tested in cooperation with an ISO-certified laboratory and receive a "Microbiome-friendly" certificate after passing all tests. Thus MyMicrobiome sets a new quality standard for the cosmetics industry.

Room: Diamond Room I&II



POSTER COMPETITION WINNER PRESENTATIONS:

MYEONG SOO PARK

Research Center, BIFIDO Co., Ltd.

Microbiome profiling of Rheumatoid Arthritis (RA) patients with different therapeutic agents reveals a novel Bifidobacterium strain as one of the ways to overcome severe RA

Rheumatoid arthritis (RA) is a chronic inflammatory disease that characterizes the inflammation of synovial cells. Several microbes have been reported to be involved in the pathogenesis of RA and microbial diversity to be associated with the disease status. Our gut microbiome analysis in RA patients revealed different profile from those of controls. The relative abundance of Actinobacteria phylum was decreased in patients and Proteobacteria was increased in controls. Bifidobacterium genus, the lower level of Actinobacteria, showed decreasing tendency according to the severity and dramatically decreased in 2nd biologics group, the most severe group. Hence, we treated a selected novel strain of Bifidobacterium to RA in vivo model mice and observed the suppressive effect of RA related symptoms and immunologic criteria.

Room: Penn Room I&II



GENOME

COMPANY

Department of Food, Environmental and Nutritional Sciences (DeFENS), University of Milan, Italy

Microbiological features and biotherapeutic effects of a probiotic mixture containing lactobacilli and lactoferrin for vaginal dysbiosis

POSTER COMPETITION WINNER PRESENTATIONS:

STEFANIA ARIOLI

Room: Mees Auditorium



Development Of Omics-Based Quality Control Of Multi-Strain Formulations Marketed As

Probiotics: The Case Of VSL#3

The multi-strain product VSL#3 was used as a model to setup quality control assessment for probiotic formulations with high complexity. Shot-gun metagenomics confirmed that 8 strains were present in the commercial VSL#3 formulation with identical genomes to that of the earlier described Streptococcus thermophilus BT01, Lactobacillus acidophilus BA05, Lactobacillus paracasei BP07, Lactobacillus plantarum BP06, Lactobacillus helveticus BD08, Bifidobacterium breve BB02 and B. animalis subsp. lactis BL03 and BL04. Cell viability and potential probiotic core benefits (β-galactosidase and urease activities) were determined using enzymatic assays combined with flow cytometry. The meta-proteomics approach allowed to identify over 1800 protein groups ascribable to all 7 bacterial species present in the VSL#3 formulation. The protocols developed in this study addressed several quality criteria for marketed multi-strain products.

50 MINUTE PANEL DISCUSSION:

Regulatory Hurdles and Other Obstacles on the Path to **Microbiome Market**

Along with the enormous promise there is lot of uncharted territory in the world of microbiome. Separating what we believe we know and what we truly know about the microbiome is essential to directing research and commercialization efforts. From scoping microbiome-based modalities and sourcing new platforms, to identifying regulatory strategies and insights there are a number of steps to development and commercialization from both the industry and start up point of view. To explore the latest on this topic from the bench through clinical solutions Johnson & Johnson Innovation gathered a panel of trailblazers for a look at case studies and historical learnings to help better understand if this is truly the golden age of microorganisms.

Potential topics covered:

- What are the regulatory hurdles at European level?
- What is the approach of the EMA?
- Is the US FDA more advanced on this front, and is the FDA's approach affecting the EU market?
- What are the clinical hurdles to be overcome?
- What is the consumer path for microbiome-based solutions?
- How will products be marketed in terms of different regulations?
- What are the thoughts on the intellectual property challenges?
- How have start-ups thought about the regulatory approach and the IP concerns?



AMY LEBLANC (Chair) Editor in Chief, BioVox



COLETTE SHORTT

Director Global Regulatory Affairs, J&J Consumer



BERNHARD PAETZOLD

Co-Founder & Chief Scientific Officer, S-Biomedic, Spain



ERIC DE LA FORTELLE Partner, Seventure Partners



3RD PROBIOTICS FORUM



KOEN VENEMA

Professor of Gut Microbiology, Centre for Healthy Eating & Food Innovation, Maastricht University - campus Venlo, The Netherlands Ingestion of probiotic Bacillus coagulans GBI-30, 6086 increases plant protein

digestion in a dynamic, computer-controlled in vitro model of the small intestine (TIM-1)

- Due to the growing world population and consumptions patterns, animal protein resources are becoming more scarce in the next decades.
- Plant proteins are a viable alternative, but have a lower digestibility then animal proteins.
- In a validated, dynamic in vitro model of the upper GI tract the effect of simultaneous addition of BC30 on plant protein digestion was evaluated
- BC30 led to increased protein digestion of pea protein, rice protein and soy protein when evaluated by alpha-amino nitrogen analyses
- Subsequent metabolomics analyses showed increased free amino acids and dipeptides in the fraction of the in vitro model that mimicked absorption by the body
- This data is promising in increasing protein digestion of plant protein, and can be applied to several population, such as vegetarians, athletes on high-protein diets, etc



OLAF LARSEN

Science Manager, Yakult Nederland, Assistant Professor (0.2FTE), VU University Amsterdam

Yakult

Towards a rational design of faecal transplant analogues

Although the gut microbiota has been studied intensively for the last decades, the understanding of the fundamental mechanisms underlying signal transduction between the microbial species is still in its infancy. In this lecture, results will be shown that explain these fundamental signalling pathways from a first order perspective using elementary graph (network) theory. Using this approach, the mechanistic rationale underlying the empiric notion that a higher microbiota richness is linked to a more robustness can be elucidated. Moreover, recent results provide ingredients to rationally design faecal transplant analogues, also providing a mechanistic bridge from probiotic single strain to multi-strain preparations.



SKIN MICROBIOME & COSMECEUTICALS CONGRESS

ELSA JUNGMAN



Founder and CEO, ELSI Skin Health Microbiome, Clean Beauty and Skin Sensitivity: How to design the new generation of beauty products

We're witnessing a radical shift in the beauty industry. With new research that improves our understanding of the microbiome, we are becoming increasingly probacterial. Simultaneously, a rise in skin conditions such as sensitive skin and new concerns about toxic ingredients are driving consumers towards cleaner and gentler products. This presentation will explain how these different factors are influencing the new generation of beauty products and how to integrate them for product development.



RICHARD ANDREWS

President and CEO, Azitra Inc., USA Leveraging the microbiome to address skin health and treat skin disease

Abstract: Skin disease and skin conditions are often the result of a complicated interaction

between dysbiosis (an abnormal microbiome on the skin) and protein deficiencies, tissue injury and/or the immune system. Azitra has developed proprietary topical treatments using natural commensal organisms that address both the underlying cause of a disease or skin condition and work to resolve the challenges of inflammation associated with dybiosis. Azitra is advancing microbiome treatments for Eczema, orphan indications such as Netherton Syndrome and for treating and preventing rashes associated with cancer therapies.

Continued

12:25-13:15

ASMA SERIER LAROCHETTE

Leader J&J Open Innovation Network (J&Join), J&J Consumer

12:50-13:15

Continued

13:15-14:15 Room: Shipping Hall Lunch / One-to-One Meetings

SPONSORED BY:



Room: Diamond Room I&II

Session Chair: Koen Venema, Professor of Gut Microbiology, Centre for Healthy Eating & Food Innovation, Maastricht University - campus Venlo, The Netherlands



TARIQ IQBAL

Professor of Gastroenterology, University of Birmingham, UK

FMT: a national service for the UK

- The journey from a standing start to the acquisition of an MHRA specials licence
- A national FMT service for patients with CDI
- Early pointers from the STOP-COLITIS trial of FMT for **Ulcerative Colitis**
- Hypothesis generation from STOP-COLITIS: The way forward to directed early phase studies in IBD?

Room: Penn Room I&II

Session Chair: Johan van Hylckama Vlieg, Vice President Microbiome & Human Health Innovation, Chr. Hansen, Denmark

GRÉGORY LAMBERT

CEO & Vice President of R&D. TargEDys SA, France

ProbioSatys, Naturally modulating the appetite via the microbiome

TargEDys is a French clinical stage biotech company aiming to control metabolic disease by modulating the appetite through an intervention on the microbiome. TargEDys'innovative, satiety inducing technology (ProbioSatys), is based on a unique understanding of appetite regulation by the microbiome at the molecular level. Bacteria can send signals of satiety to the brain from the gut by molecularly mimicking satiety hormones, thus activating natural satiety pathways. This gut-brain axis is the bidirectional communication between the central and enteric nervous systems, linking the emotional and cognitive centres of the brain with peripheral intestinal functions. Gut bacteria are very important in influencing these interactions. The basis of TargEDys' ProbioSatys technology is a commensal, enterobacteria probiotic strain, Hafnia alvei, that produces the ClpB protein. ClpB is a mimetic of the satiety hormone (α -MSH) that regulates food behavior at both peripheral and central levels. When released, ClpB directly stimulates the intestinal enteroendocrine L-cells to produce satiety hormones. ClpB also enters the bloodstream to act on satiety regulation in the central nervous system by mimicking α-MSH. The resulting effect is the feeling of satiety or fullness after a meal. The mechanism of Hafnia has been proven in vitro and in vivo and is currently being tested in humans. This probiotic will is now launched in France as a food supplement since December 2018. The preclinical results indicate that after 3 months of treatment customers can expect to safely

Room: Mees Auditorium

Session Chair: Richard Andrews, President and CEO, Azitra Inc., USA

TOM VERLINDEN

CEO, Yun (Probiotherapy) NV, Belgium Disrupting the skin industry by creating a bacterial (r)evolution

YUN is a Belgian biotech company that succeeded in building an innovative and unique R&D platform and technology, allowing to keep bacteria alive in water-based environments. Use of live beneficial lactobacilli provides an antibiotics alternative by impacting the skin microbiome. With our current data, YUN believes this will initiate a new era of skin therapeutics based on microbiome modulation, and provides a new therapeutic option to reduce antibiotic and antimycotic use for common skin conditions.

lose 3-5% of their body weight, see a 5-10% reduction in food intake, improved body composition and activation of lipolysis.



6TH MICROBIOME R&D



PAUL FORSYTHE

Assistant Professor, Firestone Institute for Respiratory Health and Brain-Body Institute McMaster University, Canada

Psychoneuroimmunology and Gut Microbes Psychoneuroimmunology is the study of the

interaction between the brain, neural functions and immune processes. It is now clear that the gut microbiota is an important modulator of these relationships. This presentation will focus on studies designed to investigate mechanisms linking gut microbes, brian function and immunity. While the enteric nervous system and vagus nerve play a critical role in transmitting anti-depressant signals to the brain, the balance between pro-inflammatory and anti-inflammatory immune responses also contributes to the behavioral effects of gut microbes. Both the nervous and immune systems contribute to the effect of gut microbes on the brain and behavior. A better understanding of the mechanisms involved will help in determining the therapeutic potential of gut microbes in mood disorders.



3RD PROBIOTICS FORUM



CATHERINE DANIEL

Group Leader in the Laboratory of Lactic Acid Bacteria and Mucosal Immunity, Center of Infection and Immunity, Institut Pasteur Lille, France

In vivo imaging to study the behavior of fluorescent probiotics in the gut

In order to better understand the interactions between probiotics and the host gastrointestinal tract, we have set up new tools allowing us to trace microorganisms in the gut of mice. We thus developed different luciferase-expressing probiotic strains (Lactobacillus plantarum, Lactococcus lactis, and E. coli Nissle) to follow them in the digestive tract of mice by non-invasive in vivo imaging technologies in healthy as well as in experimental colitis mice models. Moreover, we have also used in vivo imaging to follow the behavior of probiotics in the gut and the respiratory mucosa after intranasal administration. Finally, we have constructed fluorescent probiotic strains to follow them in the gut by fluorescence in vivo imaging and study their interactions with intestinal cells ex vivo by multi-photon microscopy.



SKIN MICROBIOME & COSMECEUTICALS CONGRESS



PETER JENS

CEO ANDBiopharma / Koppert Biologicals DNA self toxicity, a proven principle to manage bacterial and fungal skin conditions

The research for new products against pathogens and parasites implies huge

scientific and economic efforts. Traditional approaches are based on random screening procedures searching for bioactive compounds from different sources. However, the development of new products, in most cases, is limited by side effects on biological systems other than the target and by the induction of resistance in the target organisms. Consequently, despite the major and increasing efforts on research of new medicinal products, the rate of approval decreased in recent years. The recent discovery of the inhibitory effect of extracellular self-DNA opens up new perspectives for highly species-specific inhibitory products for bacterial and fungal skin conditions, with relevant patient and economic advantages. Patent WO/2014/020624 (PCT/IT2013/000193).

Room: Diamond Room I&II



HELOISE BRETON

Product Manager, Microbiome Product Development, DNA Genotek



The impressive pace of change in microbiome research and the expectations that accompany a large influx of discovery capital means we are at an important inflection point in the field. Research has lead to many ground-breaking theories and novel proofs-of-concept which are revolutionising medicine and healthcare, but to achieve true innovation (i.e. utility and lasting impact) requires significant standardisation (i.e. rigor and reproducibility). Based on lessons learned, this talk will look at "what's next" for the field of microbiome and multi-omics, from

participant engagement to processing and analysis. With the recent merger of DNA Genotek and CoreBiome, creating a leading solutions provider for multi-omics, we will also discuss how partnerships and collaborations can lead to greater discovery potential.



BENJAMIN LELOUVIER

CSO. Vaiomer

The blood microbiome: new source of biomarkers for infectious and non-infectious diseases

- Thanks to optimized 16S qPCR and 16S metagenomic sequencing pipelines, Vaiomer can quantitatively and qualitatively analyze the microbiome of blood and tissue.
- · Vaiomer has demonstrated the existence of a highly diverse blood microbiome in healthy human donors and has shown associations between changes in the blood microbiome and different non-infectious diseases.
- These associations help to understand the role of bacterial translocation in diseases and to discover new diagnostic and companion biomarkers.
- These assays were primarily designed to analyze bacterial DNA in blood and tissues of healthy donors; their signal to noise ratios are therefore high. They are also capable to detect and characterize bacterial infection in patient samples with extremely high sensitivity.

15:45-16:35

Room: Shipping Hall

Afternoon Refreshments / One-to-One Meetings / Even-Numbered Poster Presentations



DNA genotek

16:35-17:00

6TH MICROBIOME R&D & BUSINESS COLLABORATION FORUM

Room: Diamond Room I&II

BOUSHRA DALILE

PhD Student, Translational Research Center for Gastrointestinal Disorders, KU Leuven, Belgium

Contextualising Short Chain Fatty Acids in Microbiota-Gut-Brain Crosstalk: Where Do We Stand?

- SCFAs are a candidate mediating mechanism in the microbiotagut-brain axis as they might affect the brain by affecting specific cellular signaling mechanisms (gene expression, binding to g-protein coupled receptors) or interacting with gut-brain pathways (immune, endocrine, neural routes).
- SCFAs are indirectly implicated in the effects of dietary intervention on psychological functioning.
- Animal and human studies inconsistently implicate SCFAs in neuropsychiatric disorders.
- Need for systematic research of the impact of SCFAs on brain function: Discussion of methodological limitations and future directions



3RD PROBIOTICS FORUM

Room: Penn Room I&II

HERMIE HARMSEN



Vitamins and micronutrients as "prebiotics" for microbiota manipulation

The human gut microbiota plays an important role in both, health and disease, and its composition is mainly driven by diet. Current in vitro studies show the effects of food ingredients, such as vitamins and micronutrients, as stimulus for the growth of beneficial anaerobic bacteria. For instance Faecalibacterium prausnitzii can be stimulated by riboflavin (vitamin B2) since it can protect itself against oxidative stress by the use of this vitamin as electron mediator in its respiration. Pilot experiments supplementing humans with a high dose of riboflavin for two weeks indeed show stimulation of faecalibacteria, which is now validated in a larger trials. Currently, the effect of other redox mediating micronutrients on the gut microbiota is studied, to eventually use them as "prebiotic" supplements.



SKIN MICROBIOME & COSMECEUTICALS CONGRESS

Room: Mees Auditorium

BJÖRN ANDERSSON



Professor, Department of Cell and Molecular Biology, Karolinska Institute, Sweden Deep characterization of the skin microbiome in psoriasis and atopic dermatitis; insights regarding strain and virus abundance, and skin sites

In order to understand microbial diversity in skin homeostasis, and the relevance of microbial dysbiosis in inflammatory disease, large studies, where several types of data are produced, are needed. We have therefore studied the skin microbiome in atopic dermatitis and psoriasis in a large European study. We have produced both 16S and deep shotgun data, and coupled this with transcriptome data from skin biopsies. The data analysis showed that the microbiome of atopic dermatitis and psoriasis samples showed clear differences from those of healthy volunteers. While the two diseases show completely different patterns, we found associations of the microbiome with changes in gene expression for both and identified pathways of interest in both skin bacteria and host. In addition, there were clear differences in the microbiome and associated disease severity between body sites. Further results involve specific bacterial genes and strains, as well as fungi and viruses.

GUT-BRAIN AXIS COMPANY SHOWCASES:

Short presentations from some of the most exciting small and medium-sized companies in the industry



17:00-17:30 CHRISTOPHER REYES CSO and Founder, Bloom Science, USA

The Microbiome-Gut-Brain Axis in Epilepsy

- Gut microbes communicate with the brain through various mechanisms
- Select bacteria are sufficient to mediate seizure protective effects
- Biochemical interactions between bacteria modulate metabolites that regulate brain neurotransmitters



17:30-18:00 FINN TERJE HEGGE

CTO and Head of Operations, Genetic Analysis AS, Norway

Transition of microbiota analysis from research tool to clinical utility

The GA-map® technology represents a unique approach to microbiome analysis. By combining information from a well-defined set of pre-determined markers it enables highly

PANEL DISCUSSION:

Moving probiotics forward

Exploring topics such as consumer acceptance, regulation, scientific rigor



BRUNO POT (Chair)

Research Group of Industrial Microbiology and Food Biotechnology, Faculty of Sciences and Bioengineering Sciences, Vrije Universiteit Brussel, Belgium



CARINE BLANCHARD

R&D Specialist, Nestlé Research Center, Switzerland



CAROLINE KURTZ

Senior Vice President and Head of Metabolic Programs, Synlogic Inc., USA

CROSS EVENT ROUNDTABLE DISCUSSIONS:

Roundtables are informal, small-group interactive discussions on key topics in the field. Discussion leaders will introduce sub-topics/questions for discussion and roundtable attendees are encouraged to participate actively in the session.



Table 1: Beauty Brands and the microbiome MARIE DRAGO

Founder, Gallinée, UK

- · Barriers and solutions to formulation
- How can packaging help us
- How to preserve products
- Live or not?
- · What testing can we use?
- · The rise of inside-out beauty



reproducible and standardized information to be derived from the complex human gut microbiota. This information enables actionable results such as disease progression prediction and treatment response prediction. Examples of the clinical utility of the GA-map® technology will be presented.



3RD PROBIOTICS FORUM



SØREN KJÆRULF

CEO, Lactobio, Denmark CEO, Lactobio, Denmark



CATHERINE DANIEL

Group Leader in the Laboratory of Lactic Acid Bacteria and Mucosal Immunity, Center of Infection and Immunity, Institut Pasteur Lille, France



ANNICK MERCENIER

CIO, Nutrileads, The Netherlands



SKIN MICROBIOME & COSMECEUTICALS CONGRESS



Table 2: How will/can we develop microbiome friendly skincare products? Learnings from our most recent study: Lactobacillus reuteri DSM 17938 - A comparative study on the effect of probiotics and lysates on human skin.

JOHANNA GILLBRO

Co-founder and Chief Scientific Officer, Skinome Research AB, Sweden

The global cosmetic market is exceeding USD 500 Billion (2017) and we apply more and more products on our largest organ, our skin. The latest innovations within the skincare field relates to probiotics. In collaboration with BioGaia and Oriflame, we just published a study on the comparison between live probiotics of Lactobacillus reuteri and lysates thereof - Experimental Dermatology Apr 2019 poster #22. Interestingly, both lysates and live strains had anti-inflammatory activity and had effects on different barrier function genes. However, only live strains showed capacity to inhibit the growth of different skin bacteria such as p.acnes and s.aureus implicating the importance in microbiome balance after topical application. This roundtable will focus on the discussion on how to develop microbiome friendly skincare products as well as the opportunities and challenges with the development of probiotic skincare products in the light of the current use of anti-microbial agents in the production of cosmetic products.



Table 3: Gut-brain axis PAUL FORSYTHE

Assistant Professor, Firestone Institute for Respiratory Health and Brain-Body Institute, McMaster University, Canada

- Hype and speculation versus the state of the art.
- What are the major gaps in our knowledge?
- What is the potential of microbe based strategies in mood disorders?
- What is the potential of microbe based strategies in neurodevelopmental/neurodegenerative disorders?
- · The utility of preclinical models and the challenges of clinical translation.





3RD PROBIOTICS FORUM



SKIN MICROBIOME & COSMECEUTICALS CONGRESS

Table 4: Microbiome and early life HIMANSHU KUMAR

Senior Scientist, Danone Nutricia Research, The Netherlands

- Transfer of microbiota to infants maternal influence
- Development of microbiota factors influencing it
- Microbiome modulation in early life
- Opportunities and challenges in the field

Continued

Continued

Chair's Closing Remarks / End of Day One

18:10-19:10

Room: Shipping Hall Networking Drinks Reception

08:00-09:00

Room: Shipping Hall

Refreshments



6™ MICROBIOME R&D & BUSINESS COLLABORATION FORUM

Room: Diamond Room I&II

TOOLS & TECHNIQUES FOR STUDYING THE MICROBIOME

Session Chair: Hugo Roume, Operational Manager of Quantitative Metagenomic Sequencing Platform, MetaGenoPolis Unit, INRA, France



3RD PROBIOTICS FORUM

Room: Penn Room I&II

PREBIOTICS & DIET

Session Chair: Rob Beudeker, Investment Director, DSM Venturing



MICROBIOME & PROBIOTICS SERIES: FUROPE

Room: Mees Auditorium

DISCOVERY & PRE-CLINICAL DEVELOPMENT OF MICROBIOME THERAPIES

Session Chair: Colette Shortt, Director Global Regulatory Affairs,

Room: Diamond Room I&II



TINGTING ZHOU

General Manager, Novogene

Advanced meta sequencing solutions for microbiota research

Amplicon-based meta sequencing and shotgun meta sequencing are gaining more and more polularity in human research. Here Novogene present its latest developed techniques and recent case studies to give an insight of how meta sequencing benefits human health.

Room: Diamond Room I&II



KEYNOTE ADDRESS: CHRISTOPHE LACROIX

Professor, Laboratory of Food Biotechnology, Department of Health Sciences and Technology, ETH Zürich, Switzerland

Novel technologies for the production of strict anaerobic gut microbes

Production of probiotics uses almost exclusively batch fermentations of suspended (planktonic) cells with single strains. In contrast, intestinal microbes have evolved to grow in continuous fermentation comprising both planktonic and sessile (biofilm-associated) bacterial populations, in a complex trophic network with high degree of cross-feeding. New therapeutic strategies with living gut microbes to promote health are also increasingly aiming at consortia of strict anaerobic bacteria that are difficult to grow and highly sensitive to environmental stresses. In this presentation, new strategies to improve the manufacturing of live biotherapeutic products (LBPs) of single strains, consortia and standardized intestinal microbiota will be discussed, including: continuous fermentations, bacterial immobilization, and microbial biomass stabilization. Breakthrough technologies are urgently needed for efficiently manufacturing LPBs while reducing costs for global health applications.

Room: Penn Room I&II

KEYNOTE ADDRESS: PAUL DE VOS



Full Professor of Immunology, University Medical Center Groningen, The Netherlands Immune effects of dietary fiber consumption

The gastrointestinal tract harbors

approximately 80% of the human immune system. It is in continuous contact with the luminal content of the intestine and equipped with unique cell types to distinguish the good from the bad. The gut immune system has to be tolerant to the 100 trillion bacteria that support our metabolism and immunity but delete any pathogen or toxin. During recent years we have learned how to support immunity in the intestine with specific food components. By applying new technologies and better analytical approaches to characterize dietary fibers, we are more than ever able to identify efficacious immune regulating carbohydrates.

Room: Mees Auditorium



KEYNOTE ADDRESS:

BRIAN KLEIN

Senior Staff Scientist, Vedanta Biosciences, USA Discovery and preclinical strategy for microbial therapeutics

Nevogene

Vedanta Biosciences is developing live biotherapeutic products (LBPs) for treatment

of a variety of infectious and immune diseases including Clostridium difficile and Multi-Drug Resistant. Organismassociated infections, Inflammatory Bowel Disease, Food Allergy and Cancer. Vedanta develops rationally-designed consortiabased products consisting of isolated, extensively characterized, healthy human gut-derived commensal bacteria, which are manufactured under cGMP conditions. By sourcing diverse healthy human biospecimens, performing both compositional sequencing and exhaustive microbial isolation, and then combining genetic and phenotypic capabilities, Vedanta has generated a large, diverse, well-characterized microbial culture collection thereby enabling the selection of desirable beneficial strains and generation of a variety of therapeutic LBPs tailored for the treatment of specific diseases.



6TH MICROBIOME R&D & BUSINESS COLLABORATION FORUM



MACHA NIKOLSKI

Head of Bioinformatics Center; Research Director LaBRI / CNRS, University of Bordeaux, France

Computational approaches for microbiome analysis and specificities for virome studies

One of the main goals of microbiome projects is to characterize the microbial communities in terms of the identity and diversity of species present in a given environment. Current NGS technologies have provided an opportunity for doing this analysis routinely. Software tools for automated taxonomic assignment for organisms such as bacteria and fungi have since become a mature technology and are now widely used in microbiome studies. The abundance of literature on the analysis of metagenomic data has generated quite a variable terminology, which makes navigating the underlying computational concepts a complex task. In this talk we will first address classical approaches for metagenomic data generation and analysis. We will further focus on the trends in current research for the identification of viral sequences in a microbiome sample, pinpoint the experimental and computational difficulties, illustrate them on examples from our own research, and suggest possible avenues to overcome them.



3RD PROBIOTICS FORUM



JAN PETER VAN PIJKEREN

Assistant Professor, Food Science University of Wisconsin - Madison, USA Dietary fructose and microbiotaderived short-chain fatty acids promote bacteriophage production in the gut symbiont Lactobacillus reuteri

The mammalian intestinal tract contains a complex microbial ecosystem with many lysogens. Lysogens are bacteria that contain dormant viruses (prophages) inserted into their genomes. Many intestinal viruses (phages) are derived from lysogens, suggesting that lysogens are exposed to triggers that promote phage production. We show that prophages of the gut symbiont Lactobacillus reuteri are activated during gastrointestinal transit. A diet enriched in fructose further increases phage production. We demonstrated that fructose and exposure to short-chain fatty acids activate the Ack pathway, involved in generating acetic acid, which in turn triggers the bacterial stress response that promotes phage production. Inactivation of the L. reuteri Ack pathway or RecA, a stress response component, exhibit decreased phage production. Thus, prophages in a gut symbiont can be induced by diet and metabolites affected by diet, which provides a potential mechanistic explanation for the effects of diet on the intestinal phage community.



MICROBIOME & PROBIOTICS SERIES: EUROPE



MAGALI CORDAILLAT-SIMMONS

Scientific and Regulatory Affairs Director Pharmabiotic Research Institute, France Clarifying the expectations of drug authorities for Microbiotic Medicinal Products - a **European Regulatory perspective**

Regarding the latest developments surrounding food and pharma regulations, it would seem important to clarify the different initiatives and changes relative to living microorganisms and their consequences for developers. On the pharma side, clarification of the expectations of drug authorities is of the utmost importance. In this presentation, we will address certain key points facing the industry today: medical device status and robust clinical design, among others...

Room: Shipping Hall

Morning Refreshments / One-to-One Meetings / All Poster Presentations



ADRIEN NIVOLIEZ

Chief Executive Officer, Biose

Bugs as Drugs

Quality plays a major role in the safety and efficacy profile of LBPs. It is the responsibility of the LBP developer & manufacturer to ensure that the manufacturing process is adequate and that appropriate measures are put in place to safeguard the quality of the product.



SANDRA ROBELET

CSO, Syncrosome

Discussion between gut microbiota and other organs



Significant interest in recent years has focused on gut microbiota-host interaction because accumulating evidence has revealed that intestinal microbiota play an important role in human health and disease, including cardiovascular, metabolic, neurodegenerative and intestinal diseases. Changes in the composition of gut microbiota associated with disease, referred to as dysbiosis, have been linked to pathologies such as heart failure, Parkinson's disease, Crohn's disease as well as type 2 diabetes mellitus or non-alcoholicsteatohepatitis. Several Examples of preclinical models and their link with gut microbiota will be discussed.

SYNCROSOME



Room: Diamond Room I&II

MICROBIOME COMPANY SHOWCASES:

Short presentations from some of the most exciting small and medium-sized companies in the industry



12:30-12:50 ANGELA SESSITSCH

Head of Competence Unit, AIT, Austrian Institute of Technology, Austria

MicrobiomeSupport - a global initiative to coordinate microbiome research and innovation activities in the food system

The Coordination and Support Action (CSA) MicrobiomeSupport (www.microbiomesupport.eu) will be presented, which has the overall objective to establish an international network of experts and stakeholders in the field of microbiome food system research. MicrobiomeSupport follows the approach of food system and integrates actors and experts from all stages and sectors in this circular economy of food. The food system approach is part of the FOOD 2030 concept to promote a systems approach to research and innovation. The initiative facilitates multi-actor engagement to align, structure and boost R&I in microbiome and will support the European Commission by coordinating the activities, meetings, workshops and results from the International Bioeconomy Forum (IBF) working group 'Food Systems Microbiome'. MicrobiomeSupport will have a main impact on the coordination of commonly defined R&I agendas which will be incorporated into regional, national, European but also global funding programmes related to microbiomes in food systems. Furthermore, the initiative is a global initiative and has integrated international partners form Brazil, Canada, South Africa, China, Argentina, Australia, New Zealand, India and USA in order to improve the international cooperation and coordination of common bioeconomy research programmes and set a basis for common microbiome R&I agendas.



12:30-12:50 **JONATHAN DE JONGE**

COO, ARTPred, The Netherlands

Collaborations as an accelerator for highimpact discoveries in the microbiome ARTPred (ARTPred.com) is a Dutch research-

driven company in the field of reproduction, that envisions to fundamentally improve global fertility-care by break-through technologies. Together with strategic alliances ARTPred develops innovative solutions for implantation failure. A first step has been the development of their CE-certified personalized predictive test for IVF outcome, named ReceptIVFity. ReceptIVFity (ReceptIVFity.com) improves insight into the



3RD PROBIOTICS FORUM

Room: Shipping Hall

CROSS EVENT ROUNDTABLE DISCUSSIONS:

Roundtables are informal, small-group interactive discussions on key topics in the field. Discussion leaders will introduce subtopics/questions for discussion and roundtable attendees are encouraged to participate actively in the session.



Table 1: Delivery to the microbiome YOAV LIVNEY

Associate Professor, Head, Lab of Biopolymers for Food & Health, Technion, Israel Institute of Technology

- How can we effectively increase the proportion of the desired probiotics in expense of the undesired microorganisms.?
- Which is more effective: consuming probiotics, prebiotics, both? Is encapsulation of probiotics effective?
- Can we selectively target probiotics to promote them?
- What are the safety and regulatory concerns of these additives, and of manipulating the microbiome?



Table 2: Regulatory Perspectives for Live Biotherapeutic Products (LBPs)

MAGALI CORDAILLAT-SIMMONS

Scientific and Regulatory Affairs Director, Pharmabiotic Research Institute, France

Recent progress at the European Pharmacopeia has shown that authorities are on the verge of addressing key questions about the registration of Live-Biotherapeutic-Products (LBPs), and recent updates in the field point to big players gearing up to invest in this new space. Now is the time to investigate the importance of the Regulatory framework in the industry's development and growth. This will be vital if risk is to be addressed for actors up and down the pharmaceutical development chain. This round-table will look at the participants' individual challenges, regulatory priorities for the EU framework, academia's role in bringing together industry and regulators, and is the absence of a dedicated regulatory framework seen as an obstacle or an opportunity?



MICROBIOME & PROBIOTICS SERIES: EUROPE

Room: Mees Auditorium



JOS SEEGERS

Operations Manager, Caelus Health, The Netherlands

Development of microbiome-derived products for cardio-metabolic indications

- FMT as discovery tool
- Reducing risk in product development
- Data-mining and strain identification
- Preclinical development, incl.
- Strain optimization and functional testing
- Formulation development
- In-vivo testing
- Clinical development, incl.
- Study design
- Deep metagenomics



CAROLE SCHWINTNER

Pharmaceutical Development Director, MaaT Pharma, France

Develop a Microbiota-based product

Developing a full microbiome-based product to treat iatrogenic dysbiosis in severe-

pathologies context means the rising of various challenges: ethical, technical, regulatory... Since 2014, our approach is to maintain a full ecosystem in our product, giving the ability to repopulate a highly altered microbiota in patients. Challenges taken, our first clinical studies in onco-hematology demonstrate the interest of this approach.

12:40-13:10



chances of success of IVF or ICSI treatment. This test is performed prior to an IVF or ICSI treatment and examines by analyzing the vaginal microbiome whether the conditions in the womb are right for an embryo to implant. As a second step ARTPred is focusing on the development of therapeutic solutions in order to improve pregnancy chance for those women.



12:50-13:10 MOMO VUYISICH

Chief Science Officer, Viome, USA

Data-driven personalized nutrition, probiotics and medicine using advanced omics technologies and machine learning

Viome has developed a discovery platform for development and improvement of precision nutrition and precision medicine approaches. We gather accurate omics, nutrition, and clinical data, then use machine learning to develop algorithms. We are using this platform in more than 15 clinical studies to:

- Identify gut microbiome functions that are correlated with chronic diseases
- Develop gut microbiome-based diagnostic and companion diagnostic tests
- Develop personalized diets that reverse the diseasesassociated gut microbiome functions
- Enable personalization of the current and next gen probiotics. Results of several studies will be presented. We have used our discovery platform to build a machine-learnt algorithm that predicts personalized glycemic response to foods with 80-90% accuracy. We have also performed studies on the effects of gut microbiome on longevity, irritable bowel syndrome (IBS), depression, leaky gut, and many other conditions.



3RD PROBIOTICS FORUM



MICROBIOME & PROBIOTICS SERIES: EUROPE

Continued

13:10-14:10 Room: Shipping Hall Lunch / One-to-One Meetings



Room: Diamond Room I&II

COMPUTATIONAL STRATEGIES FOR MICROBIOME ANALYSIS

Session Chair: Hugo Roume, Operational Manager of Quantitative Metagenomic Sequencing Platform, MetaGenoPolis Unit, INRA, France Room: Penn Room I&II

Continued

PREBIOTICS & DIET

Session Chair: Nils Hijlkema, Business Leader Microbiome Partnerships at NIZO

Room: Mees Auditorium

CLINICAL DEVELOPMENT & COMMERCIALIZATION OF MICROBIOME THERAPIES

Session Chair: Christopher Reyes, CSO and Founder, Bloom Science, USA



GEORG ZELLER

Team Leader, Structural & Computational Biology, EMBL, Germany

Computational and statistical analysis tools for clinical microbiome studies

We will be discussing computational analysis tools that are of relevance for many clinical microbiome studies exploring changes in microbiome composition associated with disease (case control designs) or resulting from medical interventions (for instance by comparing treatment arms). In particular we will cover

- · High-resolution and high-accuracy taxonomic profiling of human microbiomes using mOTUs2,
- · Statistical tests and models for case-control microbiome disease association studies using the SIAMCAT toolbox,
- Methods for addressing confounding and batch effects in microbiome meta-analyses.

LORENZA PUTIGNANI

Head of Units of Parasitology and Human Microbiome Research, Bambino Gesù Children's Hospital, Italy

Topic: Microbiome biomarkers for metabolic disease

3RD PROBIOTICS FORUM

KIERAN TUOHY

Group Leader, Nutrition and Nutrigenomics Fondazione Edmund Mach, Italy

Diet: Microbe interactions in the gut for improved health - talking molecules

The human gut microbiome plays an important role in health and disease risk. Observed differences in microbiome structure and function between healthy and diseased states in laboratory animals have also been observed in human case control studies. However, few human studies have demonstrated clear cause and effect relationships between dietary microbiome modulation and biomarkers of chronic disease risk. Similarly, lack of mechanistic insight is hindering advancement of dietary microbiome modulatory strategies for reducing disease risk at the population level. Although we do know that colonic short chain fatty acid production, the enterohepatic circulation and cell signaling potential of bile acids, small phenolic acids released from plant polyphenols by the gut microbiota and microbial amino acid metabolism all have the potential to impact on metabolic and inflammatory pathways involved in chronic non-communicable disease, we still know little about how diet and particular foods can modulate the concentrations and flux of these microbial metabolites from the gut. This presentation will provide examples of how particular foods may modulate the production of microbial metabolites, identifying chemical entities likely to influence host



FIONA CRISPIE

Technologist, Teagasc Food Research Centre and APC Microbiome Ireland

You are what you eat: Fermented foods and their impact on our health

- What are fermented foods- give examples
- Health claims associated with fermented foods
- What is kefir
- · Microbial composition of kefir and how it changes during fermentation
- Genetic pathways encoded

metabolic and immune function.

- Modifying kefir to improve flavour or health characteristics
- Are fermented foods really good for you-some examples of work we've done
- Cautionary slides
- Future perspectives



MICROBIOME & PROBIOTICS SERIES: EUROPE

PANEL DISCUSSION:

VC & Investment in the microbiome space



MALCOLM KENDALL (Chair)

Co-Founder & CEO, Microbiome Insights, Inc.,



ERIC DE LA FORTELLE

Partner, Seventure Partners



CEES DE JONG

Former CEO, Chr. Hansen, Denmark

Conference Close

MAKING A POSTER PRESENTATION

Poster presentation sessions will take place in breaks and alongside the other breakout sessions of the conference. Your presentation will be displayed in a dedicated area, with the other accepted posters from industry and academic presenters. We also issue a poster eBook to all attendees with your full abstract in and can share your poster as a PDF after the meeting if you desire (optional). Whether looking for funding, employment opportunities or simply wanting to share your work with a like-minded and focused group, these are an excellent way to join the heart of this congress.

In order to present a poster at the congress you need to be registered as a delegate. Please note that there is limited space available and poster space is assigned on a first come first served basis (subject to checks and successful registration). We charge an admin fee of £100 to industry delegates to present, that goes towards the shared cost of providing the poster presentation area and display boards, guides etc. This fee is waived for those representing academic institutions and not for profit organisations.

POSTER COMPETITION - CLOSING DATE 19TH APRIL 2019

- Submit your entry prior to the closing deadline (1 entry per person)
- Three entries for the Microbiome & Probiotics Series: Europe will be selected by the judges
- The winner of the poster presentation will be given a 15-minute speaking position on the conference agenda and notified in advance of the meeting
- The judge(s) will make the decision based on the abstract(s) submitted
- The winner will also receive a certificate from the organisers
- Representatives from solution provider organisations are not eligible to enter the competition but are welcome to present posters at the meeting as normal

Submission instructions

We will require the form (downloadable below) to be submitted by the 19th April to enter the competition. To simply have your poster at the meeting, submissions must be made no later than 3rd May. This is the formal deadline however space is another limiting factor so early application is recommended. Therefore please contact us with any questions you have as soon as possible.





Postillion Convention Centre WTC Rotterdam

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In the vibrant heart of the Rotterdam metropolis: you cannot get more central than this. Wherever you are in the world, a World Trade Center is a special place. It is an (inter)national corporate community, in a unique building that meets the highest standards. From high-spec office space to high-tech meeting rooms, shops, restaurants and a wide range of additional services.

- A non-stop high-speed train runs between Rotterdam and Schiphol (Amsterdam airport) every 20 minutes. The journey time is 20 minutes. Cost €22 Euros
- Located in the city centre (surrounded by shops, architecture, museums, restaurants and the Port of Rotterdam)
- · Walking distance from the international train station
- Rotterdam The Hague airport with flights to at least 30 international destinations is a short taxi ride
- A large number of parking facilities can be found in the area
- · A wide variety of hotels are within walking distance. (Details will be
- sent to you in your welcome letter when you register)











DON'T DELAY, BOOK YOUR PLACE TODAY!

Places are limited and are based on a first come, first served basis so to avoid disappointment contact us today to reserve your place at Global Engage's Microbiome & Probiotics Series: Europe, with congresses featuring Microbiome, Probiotics and Skin Microbiome and Cosmeceuticals on the 20th-22nd May 2019, Rotterdam, The Netherlands.

PHONE BOOKING

+44 (0) 1865 671957 ext. 207 maria@globalengage.co.uk

Our conference team will make all the necessary arrangements.

ONLINE BOOKING

Visit the website to book your place

<u>Microbiome: www.global-engage.com/event/microbiota</u> <u>Probiotics: www.global-engage.com/event/probiotics-europe</u>

Skin Microbiome & Cosmeceuticals: www.global-engage.com/event/skin-microbiome

THE CONGRESS PACKAGE INCLUDES:

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Conference Workbook
E-Document Pack

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Hotel accommodation will be available at a group rate.

FREE NEWSLETTER

For updates on the Microbiome and Probiotics Series: Europe, plus free resources and reports, as and when our speakers authorise their release dates, check for updates at:

<u>Microbiome: www.global-engage.com/event/microbiota</u> <u>Probiotics: www.global-engage.com/event/probiotics-europe</u>

Skin Microbiome & Cosmeceuticals: www.global-engage.com/event/skin-microbiome

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