MyNewGut Final Conference
18 October 2018 – Brussels
www.mynewgut.eu

Summary
Barend Verachtert opened the final MyNewGut conference with a powerful statement: ‘scientific research is useless without the empowerment of the community and if we are to make a difference, we need to understand the entire food system, with microbiome as a wonderful example of systems thinking’.

In his talk, Barend Verachtert covered ‘Food and Nutrition Security – Framing problems & opportunities’, Food 2030 and HorizonEurope. Food 2030’ is an EU R&I Policy Framework to future-proof our nutrition & food systems – with its priorities in nutrition, climate, circularity, and innovation. 'Horizon Europe: evolution, not revolution' is the upcoming research programme after Horizon2020 and consists of three pillars: open science, global challenges & industrial competitiveness as well as open innovation.
Dirk Hadrich talked about the development and trends in the field of microbiome data and metagenomics, covered the challenges for scientists with regards to modulating health via the microbiome and microbial transfer. He concluded with an open question on 'How to promote Personalised Medicine approaches in the future' and finished with an overview of new EU-funded projects investigating the microbiome further and starting in 2019, such as ONCOBIOME, MICROB-PREDICT and GEMMA.
OVERVIEW OF THE MAIN PROJECT ACHIEVEMENTS

Project coordinator, Yolanda Sanz provided an introduction to the 5 year-long MyNewGut project and its consortium partners. She then highlighted the project’s achievements:

- Potential solutions to tackle obesity-related diseases by outlining the gut microbiota’s and diet’s roles in metabolic health, obesity and human behaviour both in humans and animals.
- The role of the gut microbiota in health programming as well as immune and brain development in newborns.
- The importance of translating microbiome science to ensure innovation finds application in industry, for instance, for the selection of functional ingredients and providing evidence-based information for consumers.
In this session, insights into the role of diet-host-microbiome interactions and co-metabolic products as contributors to and predictors of metabolic health and eating behaviour were presented.

Chaired by: Wolfgang Ahrens

Deputy Director, Leibniz Institute for Prevention Research and Epidemiology (BIPS), Germany

Francois Blachier

DIETARY PROTEINS: GOODNESS AND WARNINGS FOR WEIGHT MANAGEMENT

Francois Blachier's presentation covered high-protein diets in context of the balance between advantages of weight loss/metabolic health and the impact on the gut ecosystem. Specifically, he reported on a human intervention study where the gut microbiome was studied in response to a high-protein diet. Despite high-protein diets potentially supporting weight loss, the changes in the microbiota caused by such a diet are potentially negative for human health. Hence, Francois Blachier recommended to avoid high-protein diets in the long-term in his final conclusion.
WHAT MATTERS TO METABOLIC HEALTH: MICROBES, METABOLITES OR BOTH?

Max Nieuwdorp talked in his discourse about the gut microbiome in diet-induced obesity and whether it is causal in pathophysiology taking into account the gut-brain axis. Specifically, he outlined the outcome of a randomly controlled clinical trial (MyNew Gut’s appetit study) which examined the effects of the faecal microbiota (via faecal microbiota transplants) or butyrate by itself on the metabolic profile and neurotransmitter receptor expression on human subjects with metabolic syndrome. Effects on neurotransmitter receptor expression were attributed to the microbiota but not to butyrate. Finally, he concluded with the suggestion of stratifying patients based on gut microbiome related metabolites and microbiota strains to help tackle the diet-induced obesity problem.
Patrizia Brigidi compared the gut microbiota in people with obesity to the gut microbiota in lean people. As part of her presentation, Patrizia Brigidi questioned whether the microbiome really is involved in the onset of obesity by taking into account results from family cohort studies (NEUROFAST, IDEFICS/I.FAMILY). She concluded that obesity is a complex mosaic of endogenous and exogenous determinants and that the microbiome is only a single tile contributing to obesity development. For instance, in pre-obese children the microbiome is usually low in diversity in line with unhealthy diets. In the example of obese women, on the other hand, the occurrence of specific types of bacteria indicated a role of the gut microbiota in the frequency of eating behaviours.
Sandrine Claus

HOW PERSONAL IS YOUR METABOLIC RESPONSE TO THE DIET? HOW MUCH DOES IT MATTER?

Sandrine Claus provided an insight into metabolomics data. A clear outcome of these studies is the inter-individual variability of the human metabolic response to specific diets as well as the presence of responders and non-responders in study populations. Such observations can even be confirmed in infant studies in which newborns are either fed formula only or a mix of formula and human milk. In conclusion, Sandrine Claus’ studies confirm the importance of personalised nutrition.
Does human metabolic response to a specific diet vary from person to person? **Skimming through the numerous achievements of EU project #MyNewGut, @ClausLab highlights the importance of a holistic & continuous approach to personalised nutrition. 🌱#guthealth**

**Conclusions**

- Level of inter-individual variability of metabolic response to diet depends on the magnitude of the diet intervention.
- HPD induced homogenous metabolic response characterised by a functional shift of the microbiome towards protein fermentation.
- Fibre interventions have more subtle effects and were prone to high inter-individual variability.

EUScience&Innovation Dr Lesley Hoyles, IMT-CSIC and 7 others
In this session, studies on lifestyle factors interacting with the gut microbiota and influencing the gut-brain communication and, thereby, brain development and function were presented.

Professor of Psychiatry, University College Cork, Ireland

Catherine Stanton

IMPACT OF EARLY LIFE FACTORS ON THE DEVELOPING GUT MICROBIOTA AND THE STRESS RESPONSE

In her presentation, Catherine Stanton introduced the relationship between the gut microbiota and the immune system in the context of early life development. Specifically, she explained results from studies in infants that have altered microbiota composition due to a cesarean birth or antibiotic use (within 4 days of life). Research results indicated that the gestational age at birth and delivery mode in infants continue to impact their gut microbiota for up to four years, although no effect on motor skills and language as well as cognitive development was detected.
Cristina Campoy provided an overview of factors that influence the gut microbiota establishment, maturation and function in children such as mode of delivery, antibiotic exposure and breast milk feeding. Her studies clearly indicate that the mother’s pre-pregnancy BMI and whether infants of mothers with diabetes are fed on formula or not determines gut microbiota composition as well as metabolic and potentially mental health of children once they are older.
Peter Holzer

Chair of Experimental Neurogastroenterology, Otto Loewi Research Centre, Dean of Doctoral Studies, Medical University of Graz, Austria

DIET, MICROBIOTA AND EMOTIONAL BEHAVIOUR

Peter Holzer outlined the link between diet quality and impact on mental health for the audience, before providing detailed explanations of the role of the gut microbiota in gut-brain interactions and depression through heterologous microbiota transfer between the two. He particularly highlighted the effect of a high-fat diet on the gut microbiota, evoking depression-like symptoms and changes in the metabolome, as well as effects of antibiotic usage on both the microbiota and alleviation of depression.
Have you ever heard of the expression “gut feeling”? 😊 Peter Holzer and his research group from Medizinische Universität Graz (MUG) found out that our mental health & emotions are highly influenced by both our diet & the gut microbiota.

“High fat diet (HFD) alters gut microbial community and causes overweight, obesity and depression-like behaviour.”

Peter Holzer, MUG, Austria
SESSION 4: TRANSLATING MICROBIOME SCIENCE INTO APPLICATIONS

Chaired by: Douwina Bosscher

In this session, studies underpinning the mode of action and effectiveness of microbiome-directed foods were be presented as key activities of MyNewGut to accelerate translation of microbiome science into products and applications.

Member of Cargill Ingredient, Material & Nutrition Leadership Team and Cargill Global R&D

Nathalie Delzenne

UNDERSTANDING SPECIFICITIES OF FIBRE-MICROBIOME INTERACTIONS: HOW CAN THIS HELP?

Nathalie Delzenne initially outlined the objectives and key discoveries of diet on gut microbiota in animal studies, and the dietary fibre debate in Europe on properties and definition. She then provided deeper insights into the results of the effects of a wheat bran extract provided by MyNewGut’s industrial partner Cargill in reducing weight gain and fat mass in mice. Nathalie Delzenne concluded her talk by introducing the gut-liver axis and initial results from in vitro studies that indicate that gut microbiota metabolites affect the working of the liver.

Professor, Catholic University of Louvain, Belgium
Ted Dinan's presentation introduced the concept of psychobiotics and how they may be effective in treating mood disorders. In particular, he referred to intervention studies which tested the effect of different probiotic bacteria on stress resilience and cognitive performance during chronic exam stress in healthy individuals.
Thomas Meinert Larsen described in his talk on-going experiments investigating the effects of prebiotic fibre supplementation. Initial results show that different prebiotics may be effective in obesity management, yet Thomas Meinert Larsen highlighted that ongoing analyses of gut microbiota composition, urine/blood metabolomics analysis, urine/blood lipidomics, gut microbiota and metabolomic data are still awaiting integration into the study results before concrete conclusions can be drawn from the randomised controlled trial conducted in humans.
SESSION 5: IMPLICATIONS OF MICROBIOME SCIENCE FOR PUBLIC HEALTH

Chaired by: Anthony Leeds

This session saw a discussion on how understanding the microbiome's role in dietary health effects can impact future lifestyle recommendations and personal health management.

Professor, University of Copenhagen, Denmark
Scientific Advisory Board of MyNewGut

Jan-Willem van der Kamp

DIETARY RECOMMENDATIONS AND THE GUT MICROBIOME: HOW FAR WE ARE?

Jan-Willem van der Kamp commented on dietary guidelines and perspectives for including microbiome-informed considerations obtained from intervention studies in his presentation, with a focus on protein and fat. With the current scientific knowledge on the gut microbiome, Jan-Willem van der Kamp indicated that at the moment there is insufficient scientific evidence for including specific components such as prebiotic fibres or probiotics into dietary guidelines. He finalised his talk by looking at different dietary components (dietary fibres, fats and proteins) and their impact on human health via the gut microbiota.
Ted Dinan covered the role of *microbiota in major depression* and highlighted the difficulties in translating results from pre-clinical to clinical studies yet hinted that a Mediterranean diet (or a modification thereof) and regular aerobic exercise are essential in keeping the gut microbes happy to keep yourself happy.
SESSION 6: CLOSING SESSION

Chaired by: Yolanda Sanz

CLOSING SESSION

Yolanda Sanz, spoke warm *words of thanks* towards all MyNewGut consortium partners, for both being present on this compelling final conference day and most of all for the 5 years of hard work and dedication brought by all partners working together on this successful project.

Carina Pereira

NEXT STEPS TOWARDS A CLIMATE-SMART AND SUSTAINABLE FOOD SYSTEM FOR A HEALTHY EUROPE

Carina Pereira concluded the conference day by talking about the untapped potential of the *Food Systems Microbiome*, putting emphasis on soil and plants, food and feed ingredients, food waste and diets. Furthermore, she highlighted the new Horizon2020 projects on Food Systems Microbiomes and the *International Bioeconomy Forum* as a global microbiome initiative which is going to be supported by a Coordination and Support Action. Finally, Carina Pereira stressed the importance of engaging all stakeholders in the future directions of microbiome research and innovation, and the World Microbiome Day, an initiative to showcase the importance of the microbiome in the food system and wellbeing of animal and human populations.
CLICK BELOW AND GUT IN TOUCH!

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This project has received funding from the European Union’s Seventh Framework Programme for research, technological development and demonstration.