2019 Discussion Group Descriptions

Discussion group 1: Probiotic applications for skin and urogenital health: potential versus pitfalls

Chairs: Sarah Lebeer (UAntwerpen, BE), Gregor Reid (CA)

Questions that will be addressed in this discussion group

- Which urogenital conditions show most promise for probiotic applications?
- Do strains of the vaginal prototype species (*L. crispatus, L. gasseri, L. jensenii and L. iners)* really have more potential than other prototype probiotic species (such as *L. rhamnosus, L. plantarum & L. casei*)?
- Is colonization important for probiotic effects? How long should the probiotic strains colonize? How can in vivo colonization be predicted in an *in vitro* screening pipeline?
- How should probiotics strains targeting the female vagina/urogenital tract/skin be applied? In which formulation and application? What is the current available evidence for direct transfer vs indirect effects after oral application?
- Which regulatory paths can/should non-intestinal probiotic products follow in the different parts of the world (IND in the US, medical device, LPB, drug via EMA…)?
- Since *L. crispatus, L. gasseri, L. jensenii and L. iners* are also found on the skin in reasonable amounts, do they also have potential skin probiotics? What about their formulation and regulatory trajectory?
- Which other skin probiotic/microbiome applications are being explored?

Discussion Group 2: Probiotics and prebiotic as adjuncts to drugs and facilitators of disease recovery

Chairs: Eamonn Quigley (Houston Methodist) and Udi Ringel (Meir Medical Center, affiliated with Tel Aviv University)

The goal of this workshop is to explore how prebiotics and probiotics interact with pharmaceuticals and other therapeutic strategies to treat or prevent human disease. The following topics will be covered:

1. Diet-probiotic interactions in disease management
2. Prebiotics and probiotics as adjuncts to anti-inflammatories, immune modulators and biologicals in the management of inflammatory bowel disease. Will review evidence for their role in both the induction of remission and prevention of relapse.
3. Prebiotics and probiotics as adjunctive anti-inflammatories – the basic science
4. Prebiotics and probiotics in the management of depression, anxiety and related disorders – do they enhance conventional approaches?

5. Can prebiotics and probiotics augment the effects of diet, drugs and surgery on obesity and the metabolic syndrome?

Group 3: Prebiotic Applications in Children

Chairs: Gigi (Genevieve) Veereman, MD, PhD, KidZ Health Castle, UZ Brussel, Vrije Universiteit Brussel and Michael D. Cabana, MD, MPH, Departments of Pediatrics, Epidemiology & Biostatistics, University of California, San Francisco

Description of the Work Group Topic & Goals:

A prebiotic is defined as 'a substrate that is selectively utilized by host microorganisms conferring a health benefit'. Although there have been many clinical applications for prebiotics for adults, less is known about the potential clinical benefits of prebiotics for children with specific clinical conditions. The purpose of this work group is to review and summarize the current literature on evidence-based clinical applications of prebiotics for infants, children and adolescents. We will also describe current gaps in the literature and potential clinical applications that are promising. Our final work product a review article on the topic for a clinical pediatrics journal (e.g., *Journal of Pediatrics*).

Group 4: The future of probiotics and prebiotics for human health

Chairs: Glenn Gibson PhD, University of Reading, UK and Marla Cunningham PhD, Metagenics

Aim: To create a vision of what scientists and industry need to ready themselves for in the next 10 years.We will also consider applicability for KOLs, government and healthcare services.

Discussion points:

- Where were prebiotics and probiotics 10 years ago? What factors have evolved over this time – health outcomes, consumer perception, expansion of applications, development of methodologies?
- Using these insights, what can we predict about the next 10 years?
- Discuss emerging happenings in
    - Discovery and research methodologies – e.g. impact of genomics
    - New probiotic species - microbiome-derived, soil-derived, fermented-food derived, other
    - New prebiotic compounds – food-derived, biological mimics
    - New applications – novel ex-gut health targets
        - Incl. directly administered, as well as environmentally administered – surface sprays, cleaners, detergents, building materials, air ducts

    - Phages – emerging clinical applications, contamination implications
    - Quality assurance expectations – functional validation, structural integrity, new enumeration techniques for probiotics
    - Product format evolution
    - Government and regulatory agencies
- Consolidate key predictions into ways forward and must-dos

Group 5: RDA for live microbes

Chairs: Colin Hill PhD, University College Cork and APC, Ireland and Bob Hutkins PhD, University of Nebraska, USA

Discussion Outline

This discussion session is based on the hypothesis that live microbes form an essential part of the human (and animal) diet. The reasoning is as follows. For almost all of human evolution our food and water has contained large numbers of microbes. Our immune systems evolved to cope with this daily intake, and our microbiomes (the collection of microbes on and in the human body) are increasingly recognised as playing an important role in human health. However, in recent times we have gone to great lengths to eliminate microbes from our diets, using food processing, water purification and hygiene to reduce our exposure. But has this come at a cost? Could our immune systems, primed to deal with trillions of microbes with every meal, be struggling to cope with their absence? Could this be a factor in the rise of modern inflammatory diseases in which the immune system misbehaves in response to dietary antigens or to our own epithelial cells? Perhaps we need to go back to consuming large numbers of (safe) microbes every day - a microbial RDA?

In this discussion session we will ask the following questions

- What, if any, hard evidence supports this hypothesis?
- How can we objectively test this hypothesis?
    - Epidemiological associations (meta-analyses, systematic reviews)?
    - Interventions (RCT's)?
    - Observational studies?
- What would constitute an appropriate dose (how many organisms would have to be consumed to provide a benefit)?
- Which microbes would be considered to be safe and efficacious?
- What is the best mode of delivery?
    - Probiotics?
    - Fermented foods?
    - Supplements?

If the group reach a consensus, the next step would be to develop this into a position paper or Commentary which would be published. Background perspective: http://www.biochemist.org/bio/04004/0022/040040022.pdf